

Be a Coach

THE SCIENTIFIC BASIS OF SHOOTING SPORT



BASEL AMER



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**The Scientific Basis of Shooting Sport
Basel Amer**

كُنْ مُدَرِّباً

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Introduction

The shooting sport is of the oldest sports ever known to humanity and always associated with their survival. As humans develop techniques, methods, and tools; the sport became a global one and has its international federation runs its business. That resulted in it being incorporated with many branches of science (physiology, physicality, psychology, and so forth.) Trainers are to make champions nonetheless, that to be accomplished only by recognizing and studying those sciences as well as bases and methods of training. Fortunately, the present book discusses key sciences by which trainers' perfect technical performance—though, it is no less prominent than the latter. If a trainer's goal is to have the best players; then he must be the best as well, not only in terms of practical experience but also the bases and scientific methods—from here the name of the book was derived.

(Be a Coach)

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Chapter 1

History

Shooting Sport History

The Sport in Ancient Egypt

Shooting sport was always the favorite for juniors and youngsters, as Egyptian armies seek shooters in order to protect the country's territory. That, a shooting competition announcement panel of the 21st century BC was found depicting Amenhotep II holding his bow and a shooting target hit by arrows, four times, in front of him; he announced a huge prize for whoever breaks his achievement.

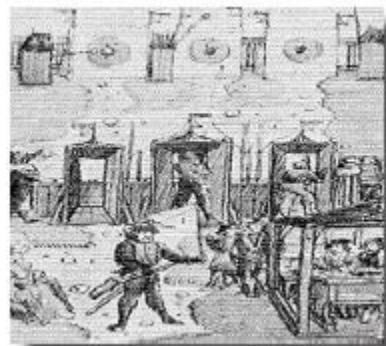


Shooting sport was first founded for hunting food notwithstanding; in the 19th century, the intraparietal revolution implied that searching for food is no longer necessary. As a result, it developed as a sport, especially in English-speaking countries such as England, the United States, Ireland, and South Africa. In 1871, the National Rifle Association, to which the credited of



developing shooting as a form of organized sport goes, was set up in the USA. In fact, Queen Victoria opened the British Shooting Association in 1861.

The sport began to appear in the first Olympic Games of 1896 and was in Athens—39 shooters from seven different countries competing in 3 pistol and 2 rifle competitions. In 1907, several countries including Europe, Austria, Belgium, France, Greece, Italy, the Netherlands, and Argentina (from South America); met in Zurich in Switzerland for the sake of establishing the International Shooting Federation. In 1916, World War I caused the cancelation of the Berlin Olympic Games as well as the dissolution of the federation. Luckily, in 1920, delegates of 14 countries attended a meeting in Paris and agreed to establish the federation once again. And, its activities continued until the Olympics of 1921 in which 16 different countries and 284 shooters attended. Skeet Men were added to shooting competitions in 1958, while the air rifle was added in 1966. The air pistol was included in 1970. Finally, air guns, 50 meters, and 25 meters pistol competition for women section were introduced in 1984.



The Olympia History

Shooting events were first introduced in most of the Olympic Games in 1896; there were also events in 1900 as well. Nevertheless, the 1904 and 1928 events never took place.

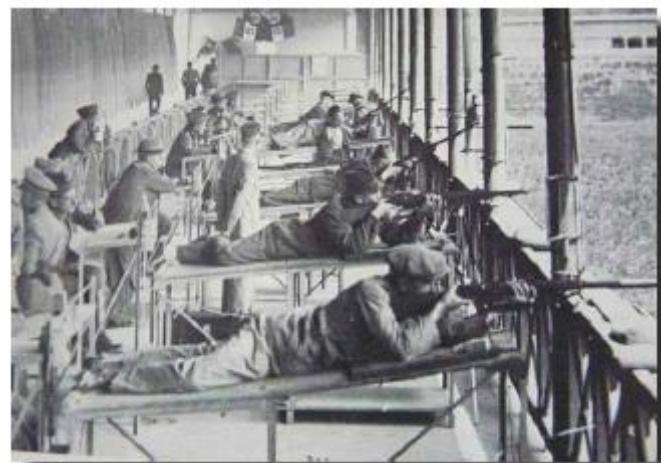


The program differed somewhat as in other sports (except sailing and yachting.) In 1908, 1912, 1920 and 1924 dozens of shooting events were combined including multiple team competitions, therefore shooters were able to win many medals of the Olympic Games.

After a pause in 1928, the sport returned to the Olympic Games in 1932 with only two events—one for pistols and other for rifles. The program has become relatively stable since World War II. Women were first allowed to compete in the Olympic shooting in 1968 and that year Mexico, Poland, and Peru introduced a single contestant. In 1984, the International Federation of Shooting, now known as the Federation of International Shooting Sport, presented separate women's events, meanwhile, between 1984 and 1992, the number of women's events gradually increased. Additionally, several events in the program remained mixed, i.e. opened for both genders. As of 1996 at the Atlanta Games, the program was completely separated—men's and women's events.

Shooting Concept

Since ancient times, humans used shooting for hunting, survival, self-defense, or controlling others. The old men used weapons they created and employed for that purpose, whether wooden, stone or metal ones; then it developed into other types, such as spears, arches, arrows, etc.



After the gunpowder discovery, shooting applied firearms, and the latter was often used in wars. German sources indicate that the pigeon-shooting existed in 1286.

Modern shooting and its Olympic Games formation started since the first Olympics in 1896, where, the World Cup for the sport began in 1897. The European competition started in 1955. The Arab Shooting Federation was founded in 1987, while the Syrian one was established in 1974. This sport receives great concern from all the countries of the world, especially its military institutions such as the army and police.



In the 19th century, some shooting sport organizations were developed such as shooting clubs and international federations of shooting. For example, the Swiss Confederation was created in 1824, while Queen Victoria established the British International Foundation of rifles in 1859. Additionally, Ernst II, the Duke of Saxony founded the German Federation in 1861. The military brass of the United States constituted the International Foundation of rifles in 1871 and the French Federation was established in 1884.

In 1896, shooting sport was introduced to the Olympic Games which were held in Athens and 39 shooters of seven countries participated in 3 pistol competitions and large-caliber rifle. Shooting sport was introduced again in the 1907 Olympic Games.

On July 17, 1907, representatives of seven national shooting federations met; six from Europe (Austria, Belgium, France, Greece, Italy, and the Netherlands) and one from South America (Argentina); in Zurich, Switzerland. The International Federation of National shooting Federations and Associations named that as the General Assembly of the International Shooting Federation.

However, the French Daniel Merillon, 55 years, from Paris, was elected as the first president of the International Federation.

In 1908, The Second General Assembly was held in Vienna during the international competitions, and three new



federations joined (England, Germany, and Hungary.) the Swiss Confederation of Shooting joined after the Second General Assembly's first decision. Later, during 1908, the United States wanted to participate in the International Federation of Shooting Sport. In 1909, the shooting family grows up and more national federations join the international one. Between 1909 and 1914, Serbia, Denmark, Spain, Portugal, Sweden, Peru, Mexico, and Finland became members of the International Federation, as a result of the International Shooting Federation's leaders' the to make it a global sports entity.

1942-284 shooters coming from 16 different countries participated in the 1912 Olympic Games in Stockholm, Sweden. The total of all competitions therein was 15 (two for pistol, eight for rifle, two for shotguns, and three for mobile targets.)

In 1916, World War I resulted in the cancellation of the 1916 Olympic Games were to be held in Berlin as well as the next international competition of the same year. President Merillon circulated a written proposal to the member associations in which he calls to dissolve the Federation—the vote was ten to six in favor of Dissolving the Federation.



In 1920, Merillon invited the national federations were members in 1915 and other federations representing new countries, formed after the war, to attend a meeting in Paris on 16 April 1920 for the sake of resuming the activities of the International Federation.

The Delegates of 14 different countries attended and agreed to re-establish the Federation under the name of "the International Federation of the Tiro Plates;" Merillon was re-elected as the president once again.



In 1920, The Olympics Games of Antwerp encompassed 21 competitions in its program, the highest number of events in the Olympia History, and 233 athletes from 18 countries participated.

In 1921, the International Olympic Committee decided that the European Federation regulations will be applied to organize events for shooting competitions in the 1924 Olympia. That was the first step in establishing a federation includes the International Shooting Federation and the International Olympic Committee, which had an important influence on the future of the former.



In 1924, Shooting competitions were held in the Paris Olympia in which more than 260 athletes of 27 countries participated.

In 1927, the president of the federation, Merillon, passed away, and his son-in-law, Jean Carnot, assumed the presidency of the International Shooting

Federation, as the second elected president after applying a separate vote at the General Assembly in Rome.

A crisis happened in the relationship with the International Olympic Committee, between 1926 and 1928. The awarding cash prizes practice at the World Championship violated the standards of the International Olympic Committee. As a result, the latter excluded the International shooting Federation from the 1928 Olympic Games of Amsterdam. Additionally, in the 1928 General Assembly meeting, the Members of the International Federation agreed to the International Olympic Committee's request to involve shooting sport in the 1932 Olympic Games program once again.

In 1932, shooting sport was re-included in the Los Angeles Olympic Games' program, but the competitions' number was widely reduced—only two pistol and rifle—and 41 athletes of ten countries participated.



In 1936, the shooting sport was involved again in the Berlin Olympia's program, and this time with three new competitions, the 50-meter rifle prone position with 30 shots, and two pistol competitions, 50-meter free pistol/25-meter fast pistol which has been tested at the World Championship of 1933.

1937 was marked by the first participation of women in the World Open Championship. Catherine Woodring shot as a member of the USA team and won the gold medal in 50-meter rifle prone position.

In 1940, the Olympic Games have not been held in Helsinki because of the outbreak of World War II. For the second time in the short history of the federation, a decision was taken to suspend the federation.

Carl August Larsson, Secretary-General of the Swedish Shooting Federation, transferred the federation's records and its archives from Paris to Stockholm, to be protected in a neutral country.

In 1947, after the end of World War II, eight federations agreed to hold a world championship and a general assembly in Stockholm, where Eric Carlson, the president of the Swedish Shooting Federation, was elected as the third president of the International Shooting Federation.

In 1948, 300-meter rifle competition returned to the 1948 Olympic program after being abandoned since 1924.

In 1954, the 1954 World Championship returned to South America for the third time in the history of the International Federation, since Caracas held in Venezuela. Afterward, a session held every four years was approved by World Shooting Championships.

In 1958, skeet men competition was added in the international federation program.

In 1960, in the General Assembly held in Rome during the 1960 Olympic Games, president, Carlson, who has worked for 14 years, decided not to be a candidate for re-election. And, the Council was attended by delegates of 55 countries elected Dr. Kurt Hassler, who was the president of the Swiss Federation Shooting as a fourth president.

In 1966, air rifle competition was added to the Federation program.

In 1970, the air pistol competition was added to the program.



In 1980, the General Assembly established the Women Committee of the International Women Federation, which replaced the temporary women committee in 1977.

In 1984, the International Olympic Committee approved on the addition of three women's competitions and 10-meter air rifle, 25-meter pistol, 50-meter rifle 3*20, to the 1984 Olympic Games.

In 1987, the annual final world cup competition started and the best shooters were invited by the international federation's World Cup to compete in the "champion of the champions" competition at the end of every year, becoming a new fundamental one on the international federation agenda.

In 1988, the women's 10-meter air pistol competition was added to the 1988 Olympic Games of Seoul.

In 1993, the Training Academy was established. By regular sessions at several locations, the International Federation of Vocational Training Academy has trained more than 400 shooting trainers from 74 different national federations.

In 1994, the General Regulations of the International Federation states the inclusion of 15 youth competitions and 10 youth competitions were added to the 1996 World Championship program. Double trap competition was added to the 1996 Olympic Games.

In 1998, at the 1998 General Assembly in Barcelona, the word "sport" was formally included in the federation's modern name, the International Federation of Shooting Sport.

In 2004, the Athens Olympic Games have experienced a participation record of 106 countries, 390 contestants were presented to contest in 17 competitions.

In 2004, after the 2004 Olympic Games, the double trap was removed as well as 10-meter women competition and The Olympic Shooting Program was reduced from 17 to 15 competitions.

In 2006, the last world championship in Zagreb, Croatia, witnessed a record of participants; 1932 athletes of 97 countries were hosted in Zagreb.

In 2007, after 20 years of the International Shooting Federation World Cup establishment in 2007, 834 players of 81 countries participated in the Munich World Cup for rifle and pistol. A century later, after that first meeting in Zurich, on July 17, 2007, the Federation celebrated its 100th anniversary and now has 158 members of 146 countries' National Federations along all the five continents.

The federation has started as a governing body for two competitions, rifle and pistol. Today it has become the world governing body for four shooting competitions, pistol, rifle, Shotgun, and moving targets involved in 15 Olympic Games and 23 World Championships. Within 100 years of the Federation activity, a small organization with quite modest beginnings grown to control the Olympic sport which is one of the largest and most popular sports in the world.

In 2008, the Beijing Olympic Games witnessed the participation of 103 countries, and 390 shooters, to compete in 15 Competition (9 for men and 6 for women) in rifle, pistol, and shotgun. That is what the President of the International Olympic Committee, Jacques Rouge, described as "tradition". The gold medal was allocated for the first of 29th Olympic Shooting Games. On August 9, Katrina Emmons, the Czech, became first Olympic gold medalist in the 2008 Olympic Games in Beijing by winning the women's 10-meter rifle competition.

In 2012, about 390 Athletes from 108 countries competed in 15 Olympic shooting competitions (9 for Men and 6 for women) rifle, pistol, and shotgun at the London Olympics.



In 2013, after the London Olympic Games, the federation has offered significant changes to the rules and laws.

In 2014, the General Assembly of the International Federation meeting in Munich (Gir), on 2 and 3 December 2014, Mr. Oligario Vazquez Rania (Mix), elected as President of the International Shooting Federation For his ninth consecutive period since the first election in 1980.

In 2016, 390 athletes of 97 countries were qualified to compete in 15 competitions (rifle, pistol, and shotgun) in the Rio 2016 - Olympic Games from 6 to 14 August.

Chapter 2

Selectivity

Selectivity for Shooters

Introduction

Selecting the proper individual for the type of sport is the first step towards achieving the competition level, so sporting activities' specialists tried to determine the necessary specifications for each particular activity; the process of proper selectivity for youth, while they are at the beginning of their career sport, is the guidance of youth to high sports. The problem of selectivity is of the most important topics that received great attention during the recent years, as it firstly aims to choose the best individual for a certain sport. Hopefully, reaching the highest levels to achieve satisfactory results and win local and international competitions is the main objective.



The need for selectivity has arisen as a result of individual ability differences in all physical, mental, and psychological aspects, which requires selection of the best individuals having various proper traits for a certain sport.

The selectivity process, particularly shooters selectivity, is the most critical and important process, as the more accurate the process is, the more successful the shooter will become. Moreover, the selectivity process is the basis of shooting sport evolution once given the most attention, according to sports and care technology's scientific evolution.

Selectivity is an important process, as it requires teamwork, including the trainer, the doctor, and the psychologist throughout the various stages. The trainer plays a primary and important role in this process due to being frequently with shooters discovering the talented ones among them—not waiting for them to reveal themselves.

The Concept of Selectivity

It is the scientific method and thoughtful planning to attain the best-talented individuals promising future success. The availability of financial and human resources won't be effective if not directed to promising ones. Selectivity is defined as the selection of human resources that have appropriate abilities in a certain sporting activity.



The Concept of Sports Selectivity

Sports' selectivity is the process of selecting the most appropriate individuals among athletes have special abilities according to the sport's requirements, which means selecting suitable individuals who have the talent and likely to achieve a successful future—according to the statistics. However, others define it as a process of selecting the best individuals through a large number of players via a time program corresponding to the setup program's stages.

The Significance of Selectivity in Shooting Sport

It is to get the best shooters to reach shooting sport's highest levels.

The need for this process has emerged as a result of different shooters in mental, physical, and mental abilities.

Admittedly, the shooter's potential to achieve higher levels becomes larger if, from the beginning, picked and directed him to the appropriate type of shooting that suits his ability. Accurately predicting the effectiveness of the training process in terms of growth and development of the mentioned abilities will allow the shooter to keep developing in shooting—that is the core of selectivity.



The Purpose of the Selectivity Process

- Early discovery of talented shooters.
- Directing those who wish to practice appropriate shooting specialties depending on their abilities and tendencies.
- Identifying the standard characteristics of the shooter.
- Devoting time, effort, and money to train those who are expected to achieve the highest levels.
- Guiding the training process to improve and develop the shooter, according to his tendencies.

Obligations of Shooters Selectivity

A clear definition of the standard attributes is required by shooting sport. That is by providing models of shooters' best level in all types of shooting to be guided into during the selectivity process.

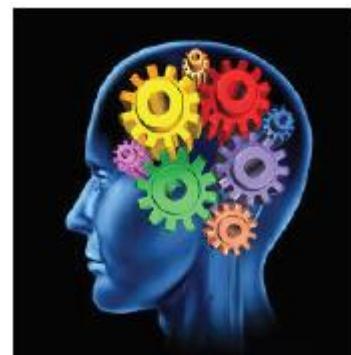
Prediction is of the most significant duties of selectivity. If we can't predict the abilities, which we couldn't identify in the early stages (the talent discovery stages); then the selectivity process is useless.

Increasing the effectiveness of selectivity processes, we are to conduct specialized research as well as studies and consider a good regulation of the selectivity process' steps—according to the scientific basis's aspects.

The Selectivity types

The Purpose of shooting selectivity is studying the aspects of physical and psychological activities in which similar individuals participate together—in terms of perception, thinking, remembering, learning, and training. According to the previous objectives, we can divide selectivity types into

- Selectivity for identifying the shooting type that suits talents.
- Selectivity for shaping harmonized teams; the use of psychological studies for team sports is required.
- Selectivity of national teams inter alia the highest-level shooters.



Selectivity Stages for Shooting Sport

1- Shooter's Selectivity Stage

This stage is an attempt to attract young, gifted children as much as possible towards the shooting sport's practice through races and competition sports by testing them for identifying their physical and skills development rates. Also, this stage is customized for 6–8 years age group to examine them and select those who have the basic requirements for shooting activities using the following effective methods

Educational observation

- The tests.
- Competitions and experimental dialogues.

- Psychological studies and examinations.
- Medical and biological examinations.

2. In-depth examination stage

This stage means scrutinizing youth who wants to specialize in shooting sport. It begins after a period of 3–6 months from the first stage beginning. Selectivity in this in-depth stage is carried out according to the preliminary stage and by enrolling youth at clubs' centers as well as schools for training purposes. This stage subject to same used methods for the first stage in Selectivity process.



3. Guiding Shooters Stage

Shooters subject to long, sustainable studies employ the used selectivity process methods mentioned in the first stage for the purpose of identifying the final specialty of a shooter.

4. National Team Selectivity Stage

This stage means selecting shooters for national teams, who meets the physical, psychological, mental, athletic, and skills requirements of the sport's clubs, and employ the same methods used in shooters selectivity of the first stage.

It consists of three stages

A. Stage 1: Preliminary Selectivity of Shooters

This stage aims to determine the general health status, specifically via complete medical examination on all vital body organs of the shooter as well as determining his physical, functional, and personal characteristics.

B. Stage 2: Selectivity of Shooters

This stage aims to select the best juniors among who succeeded in the first stage and to guide them to an appropriate type of sport, which fits their potentials and

abilities. In this stage, they will experience a sufficient training period of not a year, at least.

C. Stage 3: Qualifying Selectivity of Shooters

This stage aims to identify the best individuals after training them to achieve the highest levels.

At this stage, the focus will be on the development of shooter's special readiness, also is taken consideration of the social and psychological aspects' measurements such as self-confidence and courage in decision-making.

1. Psychology in Shooters Selectivity

Psychological factors are the ability to invest physical, functional, and motion characteristics according to the effort degree required by shooting. Every sporting activity, now, has its own psychological requirements that are incomparable with other sporting activities, such as the nature of the fundamental movement skills, the planning abilities to be used, the required mental processes, or what a shooter should feature of the mental abilities including attention, perception, intelligence, expectation, and reaction. Intellectual factors are the most important topics to be considered due to its great role in the motor behavior, emotions of the shooter, and his responses during his participation in competitions. Moreover, the use of mental abilities and intellectual factors to the maximum limit needs the shooter to exert more effort both in training and sports competitions.



The selectivity process has psychological factors of great significance in different testing stages; it represents a measure and indicator by which we can predict the gifted shooter's ability and his potential in the future of accomplishing high achievement.

Psychological diagnosis plays an important role during the different testing stages in evaluating the talented shooter's psychological characteristics and willingness to compete. These characteristics and readiness are related to the shooter's psychological requirements; psychological factors are identified in the talented selectivity process of shooting sport by the following points:

Sporting Personality Traits

Every athlete has a different personality than his colleagues despite his similarity with them in some aspects. However, when taking the overall structure of the features and talented shooter characteristics, we find him to be different from his peers in terms of personality; these characteristics can be divided into

Mental and Cognitive Traits

It is connected to intelligence, mental abilities, and shooter's awareness of the outside world (visual, perception, auditory, and movement abilities.)

Emotional Characteristic Traits

It appears in the methods of emotional activity, motivation, the shooter tendencies, trends, and the way he confronts social attitudes and adapts to mood merits, congenital and cognitive traits such as courage, determination, perseverance, restraint, etc.

Strong Management Availability

Undoubtedly, the focus on personal and administrative characteristics achieves the highest levels for the shooter, who uses all his energy in the struggle and has the determination and willingness to reach the competition. So, management plays an important role in this; trainers must work on increasing the shooter's motivation through knowledge and conviction to realize the purpose and overcome all encountered difficulties. Strong motivation increases focus and attention; delays fatigue and boredom; increases perseverance, and promotes the

training process success. During selectivity stages, psychological data are used to achieve several goals

- Predicting the rate of progress skill performance, as the high level of psychological organizing development indicates the speed of mastering these skills and vice versa.
- Directing juniors' preparation processes, promoting the growth of the nervous system functions and psychological traits required for the shooting sport.
- Increasing the effectiveness of psychological tests and psychological diagnoses during the selectivity stages, as such information is to be used from one stage to another.

Principles and Scientific Basis of Selectivity Processes

There are some principles that must be taken into account when the selectivity process is carried out to determine the shooter validity; Milinkov (1987) defined these principles as follows

Scientific Basis of Selectivity

Formulating a selectivity system for each activity or for specific competitive positions needs a great knowledge regarding the scientific basis of diagnostic and measurement methods that can be used in a selectivity process, just, to ensure that mistakes are avoided.

Comprehension of Selectivity Aspects

The selectivity problem of shooting sport is a complex and multifaceted chain in terms of the physical, morphological and psychological sides. Selectivity processes should not be restricted to one side without another. When determining the shooter validity, it is necessary to start from an integrated base to include all aspects of selectivity.

Measurement and Diagnosis Continuity

Continuing selectivity and measurement are an important principle; shooting selectivity does not stop at a certain level. It is a continuous process of studying and diagnosing of characteristics that are required by shooting. This study is conducted regularly, by the different stages of the athletes' life, to develop and improve the shooter's performance

Compliance of Selectivity Standards

The standards used in the validity determination must be flexible, adaptable, and able to be modified. The mandatory requirements of the shooter, whether rising or falling, are shown periodically by changing what they require in terms of the high and low level of competition whether at home or abroad.

2. The Humane Side of Selectivity

The use of the scientific approach in the selectivity process and obtaining accurate, objective results is necessary to protect the shooter from the negative effects of physical and psychological work that may exceed his capabilities and energies sometimes. It also protects him from frustration and disappointment resulting from repeated failures and choosing a type of sporting activity that is not appropriate to his preparations and abilities.

3. The Practical Return of Selectivity

In order to achieve the required application return, selectivity process procedures have to be more economical in term of time and money spent on the equipment and the preparation of the cadres. So far, we can continue the tests and repeat them anytime we want to give the necessary guidance based on these test results.

4. The Educational Value of Selectivity

The test results should not only be used in the selectivity process but should also be used in improving the effectiveness of the training processes in terms of

forming the preparation programs, determining loads, as well as improving the conditions and competitions positions, etc.

Determinants of Shooter Selectivity Process

Biological determinants: It includes the biological factors and variables on which good prediction is based during the selectivity process in different stages.

Psychological determinants: It includes the psychological factors and variables on which good prediction is based during the selectivity process in different stages.

Special preparations: It encompasses special preparations for shooting sport, has different requirements from other activities, and may be biological or psychological.

The preceding division of selectivity determinants does not mean to isolate each one from the another, as there is an interactive relationship among them and all are affected by the training and environmental conditions around the shooter.

Basic Elements of Shooters Selectivity

According to Han, in 1982, selecting distinguished players must take into account many elements and characteristics of future results

- * Anthropometry variables: length, weight, BMI (the ratio of muscular tissue to fatty ones), and center of pressure.
- * Fitness characteristics: anaerobic and aerobic endurance, static and dynamic strength, and reaction time (motion speed, etc.)
- * Dynamic conditions: balance, estimating distance ability, harmony, and controlling weapon ability...
- * Learning ability: Ease of acquiring observation, analysis, learning, and evaluation abilities.
- * Preparation and setting out for the desired level: attendance, discipline, and application during training.

- * Cognitive and knowledge abilities: concentration, motor intelligence (shooter's intelligence), creativity, and tactical abilities.
- * Emotional factors: psychological stability, preparing for competitions, resisting external impacts, and controlling anxiety.
- * Participation factor like accepting turns when playing and helping the team.

Selectivity Guides

Two approaches are employed in selecting talents

1. The scientific approach which relies on scientific bases.
2. The natural approach which utilizes observation.

The Scientific Method of Selectivity

Many several sports trainers still employ non-scientific approaches that rely on self-experience, chance, observation, etc.; although other sports have its own selectivity models, some shooting questions remain unanswered. For example, identifying the type of physical, psychological and skillful qualities as well as characteristics of superior athletes, using these data in forming a model for selectivity and guidance—known as models of best players.

Selectivity Benefits

1. Diminishes the time employed by the shooter in order to reach the best level.
2. Allow trainers to work with the best available individuals.
3. Allows shooters to train with the better trainers.
4. Allow talented shooters to reach high levels.
5. Making a harmonized atmosphere among shooters, stimulating them to improve their level.
6. Selecting in terms of a scientific approach makes the shooter more confident, reflecting positively on performance and training.
- 7.

Selectivity Models

There are many perspectives regarding identifying certain programs for selectivity, as it cannot be applied to all sports.

The mentioned programs are the serial stages used in applying selectivity in any sport generally.

Some perspectives on the outlines of selectivity programs are as follows

1. Gembel Model

Gambel is a German scientist encourages choosing juniors and believes in analyzing them via the following three factors:

- * The morphological and physiological measures.
- * The training ability.
- * Motives

He, also, suggested analyzing all players to be selected by internal and external factors

- * Identifying the physiological, morphological, and physical factors that influence athletic performance.
- * Applying physiological, morphological, and physical tests in schools; then relying on their results in employing training programs suitable for each player.
- * Using an educational program for specialized sport ranging between 12-24 months in which juniors subject to tests, observations, and analysis.
- * Applying a predictive study for each player and estimating his potential success odds in the specialized sport according to the positive and negative index shown by the study.

2. DRIKE Model

Drike suggested three steps to select juniors of a sport

First Step: it includes carrying out detailed measures regarding the following:

- General health condition
- Academic achievement
- Social situation and adaptation
- Body type
- Mind abilities

Second Step

It is called endoscopy stage in which comparisons between the player's body features as well as the structure and the required ones in the specialized sport or in the sport generally.

Third Step

This step includes planning a training program to be followed before the season and the player's performance is to be monitored in terms of physical, skill, planning, and psychological aspects as well as training adaptation degree.

Afterword, an evaluating process, by which we select players, is to be executed.

3. BAR-OR Model

Bar-Or has suggested five steps to select juniors

- Evaluating players in terms of morphological, physiological, and psychological aspects as well as performance variables.
- Comparing the players' weight and length measures to biological age growth tables.
- Undertaking training programs that features a load of high intensity for short intervals; then studying how juniors interact with it.

- Evaluating every junior's family in terms of morphological measures and exercising.
- Undergoing the abovementioned steps to a scientific analysis via performance models.

Training Approach if the players' group is harmonized, the training process becomes easier and likely to succeed rather than being different in terms of physical abilities.

Prediction & Selectivity

While the selectivity process enables choosing shooters in early stages and recognizing their readiness and physical abilities, the prediction process is what to happen in the future regarding that and is of the most important objectives of the former. On that, we are able to identify the shooter's future and what he will achieve. For example, if target sprinter requires selecting shooters fast in shooting, will they stay as so after years? That query is based on the consistency of the shooter's physical traits throughout the various growth stages. Once growth variables remain stable along growth stages, from early childhood to late childhood, predicting one's growth is possible. Accordingly, if there is no consistency in growth, predicting is a pipe dream, as that factor is the most important one in predicting the growth process.

Selectivity & Individual Differences

Individual differences—regarding natural readiness, physical abilities, and motion practices tendencies—requires different types of sporting activities suiting each individual; that allows the coverage of that tendencies and desired according to the scientific, physical potentials and abilities. Therefore, we have not to employ the same methods and programs to each one, as players are not identical templates in which the educational and training process is applied. The

instant requires various programs that suit the different nature of individuals—what actually happens in high-level training.

Selectivity & Classification

The classification process has many objectives

Gathering individuals of similar abilities in harmonized groups and applying special programs to them which achieve the following:

- Promoting the passion of practicing: being in a harmonized group, promotes a junior's desire to practice as well as his achievement, as a result.
- Promoting competing: once individuals' or team's levels get close, competing will flourish, as different levels might cause despair or give up.
- Justice: the less the individual differences among players or teams get, the more fear results and opportunities become.
- Motivation: close levels increase individuals and teams' motives to compete.

Problems of Shooters Selectivity

- Relying on constant physical qualities in predicting the talented shooter during the evaluation process, there are other changing social, psychological factors.
- Not having measures or constant standards that identify the talented shooter's abilities, as tests, carried out during the selectivity process, show only a small ratio of the real abilities of the shooter.
- During the selectivity process, it is difficult to judge a talented shooter, as talent is a rare thing.
- Not having a known age for the appearance of talent, as the latter is related to the development of the shooter's constant, various abilities (physical,

psychological, motor, etc.). That raises the problem of how to detect, recognize, and guide it towards the shooting sport.

Chapter 3

Anatomy

Anatomy Concept

A science studies and describes the human body parts and explains all the organs, systems, their relationship with each other, and its tissues.



Anatomy Significance

Anatomy is the basis for other sciences such as massage, physiotherapy and field injuries.

However, it allows the identification of congenital defects, and thus describing the exercises necessary for treatment can be done.

Anatomy helps to know the composition of a proper human body and therefore can determine the right and convenient movement of that body.

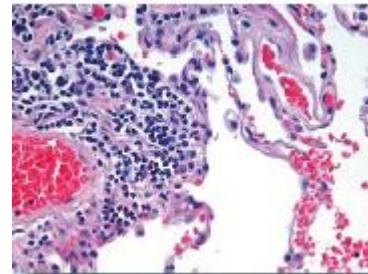
Another use is observing the children's normal growth rate, which is handy in forming their bodies and the treatment of any physical errors may appear during the stages of growth.

Anatomical Position

The state in which the human body can be described, and stands straightforward on the feet, metatarsal bones forward, the head to the top, sight forward, the hand extended, the palm of the hand forward, and fingers down.

Tissues of the human body

There are four main types of tissues in the human body



- Connective tissue.
- Neural Fabric.
- Muscular tissue.
- Epithelium tissue.

The Motor System

It consists of three main sections

1. Skeleton.
2. Joints.
3. The muscular system.

First: The Skeleton

It is made up of 206 bones connected with each other.

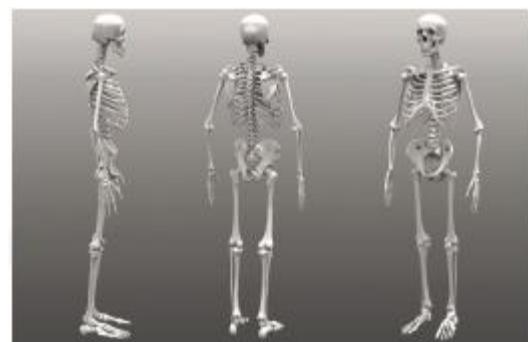
The Significance of the Skeleton

It is the main axis in the human body that balances and keeps its straight shape.

The bones protect the body's vital organs such as the heart and lungs via the rib cage.

Having small separated bones helped the body to perform its different movements.

Body bones act as reservoirs for calcium, phosphorus, and magnesium salts, which are vital for blood physiology.



The bones contain a yellow-colored substance known as the bone marrow and are important for the muscles, as it's the center of their coherence and organ.

Types of Bones

The human body has many different bones considering length and shape; it can be divided in terms of shape into the following:

1) Long cylindrical bones

It features a long cylindrical shape; two limbs and a body; and a metaphysis at its lower end, growing up and down, such as the femur, humerus, clavicle, ulna, radius, fibula, and tibia.



2) short cylindrical bones

It features a short cylindrical shape, one side, and a body with a metaphysis at its upper end. These bones grow only upwards, such as metacarpal bones, metatarsal, hands' phalanges, and phalanges of the foot.

3) Short bones (small)

The bones have a body only, no limbs, and a have primary center only, such as the bones of the carpal bones and tarsus.

4) flat bones

It features no bone cavity and is flat-shaped, consists of two layers of thin bone tissue between a layer of fragile bone tissue, such as the bones of the pelvis, the shoulder pad, the skull, and the shear.

5) irregular bones

The bones are characterized by having no particular shape and having various spikes that make its shape irregular such as vertebral column's vertebra.

The Skeleton

It consists of the following bones:

First Upper Limb Bones

- * The bones of the skull
- * Clavicle
- * Sternum
- * Rib bones
 - * Backbone bones
- * Scapula bones
- * Forearm bones
 - A. Ulna
 - B. Radius

Bones of the Foot

- * pelvis
- * Femur
- * Leg bones
 - A. Tibia
 - B. Fibula
- * Patella

Joints System

A joint is a connection, center, or the fulcrum of two or more of bones' ends which cohere to each other by connective tissues flexible fabrics



according to the necessary movement.

Joints Types

It can be divided into three types in terms of its synthesis

1) Fibrous joint

It is known as the motionless joints and consists of the convergence or cohesion of the surface of two bones together

connected
by strong
fiber tissue
and often
the surface
of the joint



is not smooth. However, it helps in protecting vital organs inside, such as some joints of the facial bones and bumps of the skull bones.

2) cartilaginous joints

It is known as the joints of limited movement and consists of the convergence or the cohesion of two bones together, connected by strong fiber tissues and covered by cartilage tissue helps the cartilage in the movement of the bones and limited absorption of shocks, such as primary cartilaginous joints or secondary ones.

3) synovial joints

It is known as joints with a wide range of motion, which allows the joint to move in one direction, two directions, or several ones and is characterized by the following structure:

- * The convergence or cohesion of two bones or more, connected by a strong fibrous tissue.
- * There is a cavity between the separated bones leading to a free movement.

The joint is covered by the joint capsule consisting of a large number of fibers, usually cylindrical, that get together in the form of bundles. It protects the joint and its internal parts from injuries, as it has strong tissues and its fibers of different directions are increased in areas need a wide range of motion—known as capsular ligaments.

The joint capsule is internally lined of articular membrane called the synovial bursa. That is used in absorbing shocks and protecting the bones from direct friction. The synovial fluid is the only nutrient of the articular cartilage and it contains cells takes in bacteria that attack the joint.

The articular surfaces are covered with a cartilaginous layer that each cartilage fits the surface it covers.

Often, there are ligaments outside the joint capsule strengthening it and the joint in special areas needs a wide range of motion and protection. Each ligament is recognized by its contact

points or work. The most famous one is the cruciate ligament.

Muscular System

Anatomy studies skeletal muscles (Voluntary) of the human's body.

Muscles are the red flesh of the body and are about half its weight, which is the key factor in the movement of any body part.

The human body contains more than 600 muscles and most of the voluntary muscles are connected to each end of a bone of the skeleton or more. Those links are known as the following:

(1) The Organ of the Muscle

The muscle is connected to one of the bones by its muscle fibers. This is called the organ of the muscle, which is the fixed limb and is a thick red, soft muscle part called the belly of the muscle—often one or more for each muscle. For example, the biceps muscle has two heads, where the triceps muscle has three heads. The muscular part of a muscle squeezes and stretches via a stimulant; nerves

and blood vessels are in the muscular part of a muscle.

(2) The Position of the Muscle

The other end of a muscle is connected to the end of another muscle near the first by a white fibrous cord.

That is the moving part of it, namely the muscle position. Between the organ and the position (the two bones to which the muscle connects) comes a joint by which the two bones move when the muscle gets stimulated.

(3) Tendon

It is a group of fibrous fibers that arise from the muscles, which are either open round or wide and flat. That is actually a group of muscle cell membranes



that remain undifferentiated after the transformation of the middle bacterial layer, i.e. the mesodermal layer, to muscle tissues. Nonetheless, these tissues form the organ and position of the muscle at the ends of the bones in most cases—or combined with other muscles.

(4) Peritoneum

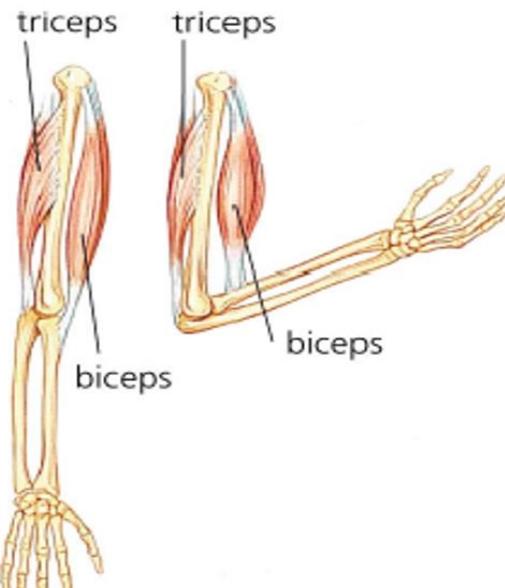
It is a wide flat plate meant for adapting the organ or the position of particular muscles, especially, to be able to do its job as fully as the abs and the latissimus dorsi muscle.

(5) Fascia

A. Superficial Fascia

It is the cystic fibrous lipid layer located directly under the skin covering all the parts of the body that were covered by former, but vary greatly in thickness in favor of the fatty tissue amount in it. This difference is not confined to obese individuals. One purpose of this superficial fatty fascia is to improve the human body image, cover many

of the bone spikes, tendons, facial cavities, and other areas.



Women have superficial fascia more than men. Also, this fascia is a rich source for the skin layer, blood vessels, lymph vessels, sensitive nerves, and glands.

It, additionally, allows all the mentioned to move freely and restores a fatty layer to be used by the body under certain circumstances—such as a disease—and keep the heat temperature constant regardless of the weather changes.

B. Deep Fascia

It is strong fibrous membranes with different fibers and directions that lie

under the superficial fascia and encapsulate the muscles, as groups and individuals, strengthening it and increasing the energy of its contraction as much as possible— also surrounds vessels, nerves, glands, and others.

However, deep fascias some parts are employed as barriers between the different group of muscles, such as extensor muscle and constrictor muscles. These barriers are often connected and related to the bones so that it became real barriers between each of the muscles two groups. In many cases, these deep fascias contribute to the organ or the positioning of some near muscles to strengthen or adapt to its work according to the present conditions.

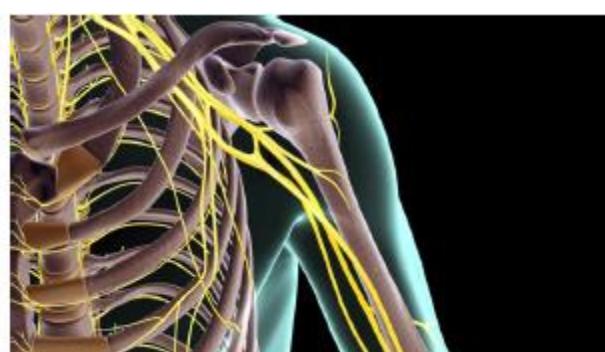
(6) The Muscle Body

A tissue constricts and extends that may up to half of the body weight

(7) The Muscle Movement

Each muscle has a function it performs to move the related bone including extension, contraction,

approaching or distaining the related part of the body. Sometimes, a group of muscles joins together to perform a certain function, contracts, and moves as a result of the signals and stimulants it receives from the nervous system via the connected nerves. It also moves by other non-nervous stimulants, such as an electrical alert when an electric current pass through it, chemically or mechanically. During muscle movement and contraction, most of the thermal energy that maintains the body's temperature is generated, regardless of the external temperature.



(8) The Nerve

Each muscle has a directing nerve or more for the purpose of moving it, as the latter conveys the mind's orders via the spinal cord.

(9) The Synthesis of the Skeletal Muscle

The muscle fiber is the basic unit of the muscle in which all characteristics appear. Muscle fibers are gathered to form a muscle fascicle, while the latter is gathered to form adjacent ones surrounded by connective tissues to introduce the final shape of the muscle.

(10) Types of Voluntary Muscles

Red Muscle Fibers

It features a red color as a result of containing a huge amount of myoglobin and mitochondria and can work for a long time.

White Muscle Fibers

These fibers feature a white color due to the lack of myoglobin unlike the red fibers and contain a greater ratio of phosphocreatine, calcium, and glycogen, so it is Fast-contraction.

Muscle Groups

| Muscles of the upper part | Muscles of the lower part |
|--------------------------------|------------------------------|
| facial, head, and neck muscles | Pelvic muscle group |
| Torso muscles | Thigh muscles |
| Back muscles group | Hamstring muscles |
| Front brachialis muscle | Calves muscles |
| Back brachialis muscle | Gastrocnemius muscle |
| Front forearm muscles | Extensor retinaculum of foot |
| Back forearm muscles | |
| Hand muscles group | |

First Muscles of the Upper Body

(1) facial, head, and neck muscles

The temporal muscle

Masseter muscle

Zygomaticus major muscle

Corrugator Supercilii

Occipitofrontalis muscle

Buccinator muscle

Sternocleidomastoid muscle

Platysma muscle

Longus colli muscle

The long muscle of the head

External pterygoid muscle

Lateral rectus muscle

(2) Torso Muscles

Pectoralis major muscle

Pectoralis minor muscle

Serratus anterior muscle

Conjoint tendon

Abdominal internal oblique muscle

Transverse abdominal muscle

Rectus abdominis muscle

Diaphragm

External intercostal muscles

Internal intercostal muscle

Subclavius muscle

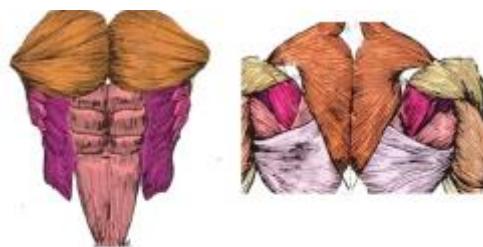
Deltoid muscle

(3) Back muscles group

Trapezius muscle

Latissimus dorsi muscle

Serratus posterior inferior muscle



Rhomboid major muscle

Rhomboid minor muscle

Supraspinatus muscle

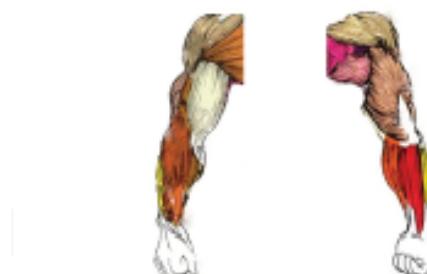
Infraspinatus muscle

Spine of scapula muscle

Teres minor muscle

Teres major muscle

Spinalis muscle



(4) Front brachialis muscle

Biceps muscle

Brachialis muscle

Coracobrachialis muscle

Brachioradialis muscle

(5) Back brachialis muscle

Triceps muscle

Anconeus muscle

(6) Front forearm muscles

Pronator teres muscle

Pronator quadratus muscle

Flexor carpi ulnaris muscle

Flexor carpi radialis muscle

Flexor digitorum superficialis muscle

Extensor digitorum muscle

Extensor pollicis longus muscle

(7) Back forearm muscles

Supinator muscle

Extensor carpi ulnaris muscle

Extensor carpi radialis longus muscle

Extensor carpi radialis brevis muscle

Extensor digitorum muscle

Extensor indicis muscle

Extensor pollicis longus muscle

Extensor pollicis brevis muscle

Extensor pollicis longus muscle

Muscles of the lower part

(1) Pelvic muscle group

Gluteus maximus muscle

Gluteus medius muscle

Gluteus minimus muscle

Psoas major muscle

Quadratus lumborum muscle

Iliacus muscle

Piriformis muscle

(2) Thigh muscles

Quadriceps extensor muscles

Rectus femoris muscle

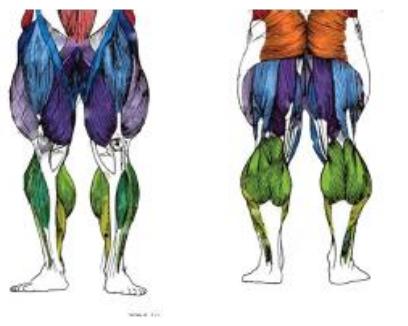
Vastus intermedius muscle

Vastus lateralis muscle

Vastus medialis muscle

Sartorius muscle

Pectenous muscle



Gracilis muscle

Pectenous muscle

Adductor brevis muscle

Adductor longus muscle

(3) Hamstring muscles

Biceps femoris muscle

Semitendinosus muscle

Semimembranosus muscle

(4) Calves muscles

Tibialis anterior muscle
Peroneus longus muscle
Peroneus brevis muscle
Extensor digitorum longus muscle
Extensor hallucis longus muscle
(5) Gastrocnemius muscle
Inferior gemellus muscle
Soleus muscle
Popliteus muscle
Plantaris muscle
Tibialis posterior muscle

The Shooter Body Posture Issues

Posture Deviations

A posture deviation is a, fully or partly, change in the shape of a body organ, as it deviates from the anatomically recognized natural form.

Category 1

During the growth period, the musculoskeletal system may deviate; different posture deviations develop usually in childhood. These changes are reflected in the shape and function of other organs and many reasons affect these deviations

a) Congenital Causes

This may be due to the wrong



ADAM.

position of the fetus in the uterus, taking certain drugs during pregnancy, or the mother's malnutrition. These congenital posture deviations start before giving birth and may be due to certain genetic factors such as receiving a trait from one of the previous generations by the dominant genes of a parent.

b) Acquired Causes

It varies and impinges on the posture of children, adolescents and, young people, such as

1. Wrong Habits

These habits like others, such as speaking or walking, are the automatic situation repeated in

certain fixed conditions and arise as a student takes a certain position when sitting, standing, or holding his bag. Factually, the mentioned position may be repeated until the body accommodates to, and thus hands relax, some muscles lengthen or shorten—accordingly the posture deviates.

2. Fast Growth

Somebody organs may grow faster, throughout teenage years; than others, causing a failure in using body parts and posture deviation afterward.

3. Injury

A fracture, muscle strain, or ligament injury may cause an imbalance in the body and if continues long the body takes a special position to relax.

When an individual loses a sense, such as hearing or sight, his body becomes forced to take a certain position relieving the burden on the eyes during reading and thus leads to a deviation.

4. Diseases

Diseases that affect the bones, muscles, or make joints lose flexibility and ease of movement affect the posture—for example, rickets, and osteomalacia—as it weakens the



muscles making them unable to perform their functions, causing a deviation.

5. Malnutrition

Malnutrition affects the body muscles, making it lose its strength. Therefore, the individual becomes incapable of standing straight and the body becomes weak and skinny. Overnutrition leads to obesity and may impact on bones until developing a flat foot condition.

6. Muscular dystrophy

Healthy muscular and nervous systems allow an individual to stand straight; any muscular or nervous deviation may cause different types of posture deviations.

7. Profession/occupation Type

An individual's type of profession may require the use of a muscles group strengthening it without other muscles, resulting in a posture deviation—such as ironers, Couriers, and typists.

8. Clothes

Tight clothing hampers the body's vital organs from doing its best. Tight belts hamper the movement of the diaphragm, leading to irregular breathing, where tight shoes as well as high heels increase the angle of the pelvis and lead to lordosis—as a result, the spine gets affected.

9. Fatigue

Fatigue, whether mental or physical, obstacles any neuromuscular activity, as tired muscles move wrongly

causing a posture deviation. Muscle weakness changes the proper position of bones on the long course causing a deviation as well.

10. Wrong Sporting Practice

The wrong practice of sports activities, without qualified teacher or trainer, may cause harm; the same happens when not employing scientific training methods causing physical deviations due to abnormal muscles growth—some lengthen and others shortened. For sports programs to achieve their objectives, physical and emotional recognition of juniors must be applied, so that the strengths and weaknesses are clarified. Accordingly, the appropriate programs are planned along with a periodic test and detection to ensure the effectiveness of the programs and modifications it needs to attain the best results.

Posture Deviations Degree

1. First Class Deviations

Changes of muscle contractions and regular posture positions occur in this type of deviation, while no changes happen to the bones. It can be treated via physiotherapy exercises and the general sense of one's self trying to fix it.

2. Second class Deviations

The contraction of soft tissues becomes obvious, such as muscles and ligaments with an average bone change, and need a physiotherapy expert to treat it properly.

3. Third Class Deviations

The change of the bones is severe, as well as muscles and ligaments changes, and difficult to fix. This type mostly requires surgical intervention and physiotherapy exercises to avoid other posture deviations.

Diagnosis of Posture Deviations

How to start diagnosing these deviations and where to look?

Diagnosing one's deviations while being dressed up does not give a clear picture of the matter, as clothes hide almost everything. Judging by only looking is not right all the time; therefore, one must undress and get his feet naked—wearing only a short.

Important parts that must be focused on are the following:



The Head

1. Head tilt



2. Head Fall, downwards or upwards
3. Shortness of neck area

The Torso

1. Lordosis
2. Round back
3. Scoliosis

The Chest

1. Pectus excavatum
2. Pectus carinatum
3. Funnel chest

The pelvis

1. Anterior pelvic tilt
2. Posterior pelvic tilt
3. Lateral pelvic tilt

The Scapula

1. Winged scapula
2. Scapular dyskinesis
3. Scapula lump

The Shoulders

1. Shoulder elevation
2. Round shoulders
3. Back-oriented shoulders

The Elbow

1. Overextended joint
2. Bent joint

3. Fixed in supination or pronation

The Hand

1. Drop hand
2. Simian hand
3. Claw hand

The Knee

1. Knock knees

The Leg

1. Flat foot
2. Hallux varus
3. Hallux limitus
4. Hallux rigidus
5. Bunion
6. Clubfoot

Most Common Posture Deviations for Shooters

* The Upper Body Posture Deviations

Lordosis

Round back

Scoliosis

* The Lower Body Posture Deviations

Anterior pelvic tilt

Posterior pelvic tilt

Left pelvic tilt

| | |
|--|--|
| Right pelvic tilt | Forearm muscles |
| Flat foot | * All front and back leg muscles group |
| * Muscles working in all competitions | |
| 1. The rifle | 3. Target sprint |
| * Facial, head, and neck muscles | * Facial, head, and neck muscles |
| Rectus capitis anterior muscle | Rectus capitis anterior muscle |
| Lateral rectus muscle | Lateral rectus muscle |
| * Torso, chest, and shoulder muscles | * Back muscle group |
| Pectoralis major muscle | Trapezius muscle |
| Pectoralis minor muscle | Deltoid muscle |
| Serratus anterior muscle | Pelvic muscle group |
| Deltoid muscle | Gluteus maximus muscle |
| * Back muscle group | Gluteus minimus muscle |
| Trapezius muscle | * The thighs muscle group |
| Latissimus dorsi muscle | Quads |
| * All front and back leg muscles group | Rectus femoris muscle |
| 2. The Pistol | Vastus intermedius muscle |
| All front and back leg muscles group | Vastus lateralis muscle |
| Pectoralis major muscle | Vastus medialis muscle |
| Pectoralis minor muscle | Sartorius muscle |
| Serratus anterior muscle | Gemellus muscle |
| Deltoid muscle | 4. Shotgun |
| Biceps muscle | *Facial, head, and neck muscles |
| Triceps muscle | Rectus capitis anterior muscle |
| | Lateral rectus muscle |
| | *Torso, chest, and shoulder muscles |
| | Pectoralis major muscle |

Serratus anterior muscle

Abdominal muscles

Biceps muscle

Triceps muscle

Forearm muscles

* Pelvic muscles

Gluteus maximus muscle

Gluteus minimus muscle

* The thighs muscle group

Quads

Rectus femoris muscle

Vastus intermedius muscle

Vastus lateralis muscle

Vastus medialis muscle

Sartorius muscle

Gemellus Muscle

Chapter 4

Technical Preparation (Rifle)

The Rifle

Rifle Competition

10-meter Air Rifle Competition

50-meter Shot Competition

300-meter Shot Competition



First Air Rifle Competitions

Men/Women

60/75 shots/min.



Second Shot Competitions

1. 50-meter prone position competition men/women

60/50 shots /min.

2. 50 meters three positions competition men/women

Standing + prone position + kneeling position 40 shots per

position

165 min. as total time



Third 300 m Shot Competition

- 300-meter prone position

competition men



60 shots

- 300-meter three positions men

Standing + prone + kneeling positions

40 shots per position

- 300-meter three positions men



Technical Preparation of Shooters

Conditions to be met by the shooter

First External Position

1. Easy to perform.
2. Comfortable for staying long and stable.
3. Achieves a good balance.
4. Achieve a great degree of stability.
5. Helps to control the weapon.
6. Does not cause physical problems.
7. The weapon is directed to the target using minimal muscles.
8. The position is based on the skeleton.



Second: The Internal Position

It is the level of muscles tension of the shooter and the relationship between the parts of his body.

The internal position cannot be observed from the outside but is performed by the sense of the shooter.

A position employs the minimal constant muscle tension is the basic condition for good shooting performance.

As the muscles are the only thing that shakes in conjunction with nervous tension, not bones or ligaments, shooter should be fully relax.

The Standing Position

The Position should be performed first without shooting tasks to be mastered and get the trainer to depend on the shooter's skeleton and taking the right position.

Building the Standing Position

1. The feet
2. The pelvis
3. The Chest and the abdominal muscle
4. The Shoulder
5. The left arm
6. The right fist
7. The trigger
8. The cheek rests
9. The head
10. The movements
11. Supporting means

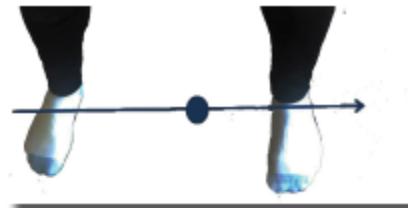
1. Leg Position

—The legs are the main support of this position, the pillars that hold the body and the weapon, also, control the balance and shakes by a great ratio.



Leg Direction

- The left leg has to be parallel to the right one as well as the target; depending on the body comfort and balance.
- The weight on each foot should be even instead of focusing on the insteps more than the heels; actually, the opposite is right.
- Balance is the primary goal of the legs position and shape; it can be achieved and mastered by closing the eyes while carrying the weapon and moving slightly—until you achieve it.
- Balance comes from the legs, as they support the body, keeping a strong position, without any displacement or curvature, and therefore must endure the body and weapon's weight.
- The legs' breadth affects vertical stability.
- The insteps direction also affects horizontal stability.
- The position must rely on bones, not ligaments nor muscles.
- Directing insteps to the outside makes the balance to the front while closing them makes the balance to the back.
- The balance point should be between the legs and to the target slightly.



Pelvic area

The pelvis' direction or the center of the body must be perpendicular to the target and in a natural position. Pushing the center to the target direction in order to have strong support to the left arm is favorable, taking into account its position [the center] concerning the legs as well as the upper body (Chest and Abdomen); the body must be stable, as it affects shooting accuracy.

The abdomen and chest position for the rest of the body also must be streamlined, allowing breathing easily, without any effect on the sight movement.

The chest in the standing position must be to the back to equal the weapon's weight and balance the movement or accidental shake.

The abdomen and chest's position should support the balance, breathing easily, and having a comfortable position for a long time—without any fatigue or exhaustion. Both should also fit the neck and center's position.

The mentioned position restricts and significantly affects the balance; the shooter must balance the body with the weapon to the center and the target direction. Additionally, it is important for the center to be pointed to the target automatically.



Shoulders

The shoulders' height must be almost equal, and no one is higher than the other; their shape should also fit the body.

The physical contact power of the shoulder and the butt pad must be fixed in terms of position and strength during each shot.

The shoulders' relaxation must be fully accomplished; this point is critical, as it is a common mistake in most beginner shooters and often caused by a lack of proper pointing height to the target.

The effect of the shoulders on zero points is also intense, so always take the proper position and look down.

The Left Arm

The left arm is the supporter and bearer of the weapon; it has a really important effect on zero points and stability, so you have to be highly relaxed before, during, and after the release.

Its inclination and direction influence the balance due to carrying the weapon's weight; it also must be under the arms directly, especially in the standing and prone position.

However, you should mind the weapon's position and forms according to the left hand and achieve the necessary support.

In that forms, whether pointing or stabilizing the weapon, it would be best to use the arm as a supporter only—without any muscle effort.

The Right Fist

Grasping strength varies from shooter to another and can be adjusted by NOPTEL method or silencing; we will discuss that in terms of grasping strength, tightening, controlling gravity, and direction.

- Its impact on the weapon's balance.
- Its impact on stability and the direction of the movement.
- Its effect on pulling the trigger, as the direction of the grasping and its strength affect significantly on pulling the trigger.



Shooting

It is adjusting the rear sight and the front one.

The front sight must be in the middle of the rear one. The distance between the eye and the rear sight affects the vision—should be 7–5 cm.



Positioning the cheek on the cheek rest significantly determines the parallel of both sights—the front has to be in the middle of the rear one as well as its height.

Positioning the front sight

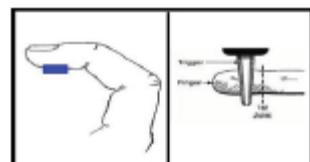
The front sight's wideness should be adjusted to suit your shake and achieve a clear vision of the target and the distance between it and front sight, which vary from shooter to another.

Trigger

It's necessary to study the trigger and how to adjust its movement in terms of



- The finger's position on the trigger and vice versa.
- The finger movement in terms of strength, direction, and timing.
- Its relation to the right-hand strength and its impact on the finger's movement.
- Mental management to pull the trigger during the moment of release.
- The trigger's weight and its system, whether with the pulling movement or without.
- The timing of pulling or touching the trigger in relation to the natural view.
- The trigger and finger's position after releasing the shot.



The goal here is to release the shot as stable as possible or at the stability's peak in the middle of the 10 meters circle without losing or impinging on it; this must be at a fixed time and form in each shot.

The cheek rests

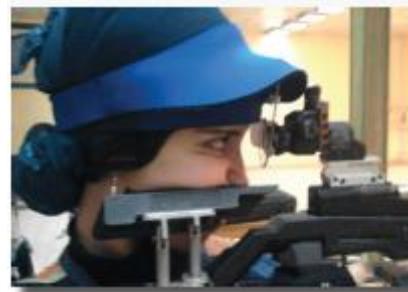
When positioning the cheek rest, make sure to perform the position first without it and shoot 5–10 shots; then raise it to only touch your cheek, as a guide. Finally, release a number of shots, and then get it closer to your cheek, for

- Comfortable position for the cheek and neck
- Seeing the sight naturally (front sight in the middle of the rear one)

The Head

The shooter's head is most of his body weight, so it must be balanced and not lean forward as much as possible.

That weight should not be added to the weapon's weight, as it will affect the stability and direction, and the shooter will not be able to control it. So, the appropriate position is the natural one and the weight should be carried by the body—not by the weapon.



Movements

The shooter performs plenty of movements in the shooting process; so, these movements are to be fixed in terms of number, pace, strength, and performance each time—such as

- Handloading movement.
- Grasping movement.
- Head movement.
- Cheek movement and its position



every time on the cheek rest.

- The whole-body movement and returning to the first position.
- Eye movement and vision's limit.
- The left-hand movement in take the right position.
- Performing the position and lowering are of the most important movements that affect the external position's shape as well as the Zero point; you've to employ the minimum possible movements and the shortest possible distance.

Aids

There are some things that always help shooters and have to be dealt with carefully.

- The ammo's location should be close and helpful to the shooter.
- The position of supporting the weapon must be to the nearest body point and not exceed the shoulder's height.

The Aids Provided to the Shooter for Self-sufficiency

The clock should be in a notable place, but not in the view, and after each shot, the shooter has to adjust the pistol measures.

The trainer must realize that measures' adjustment is of his main tasks and it differs from shooter to another.

Adjustment of measures is a process in which the weapon is fitted to the shooter so that he is in a natural state. Measures make the rifle points to the target without any muscular effort for the purpose of



- The external natural view is formed without any muscular intervention.
- Full control of weapon using a minimum effort.
- The weapon measures maintaining the external position of the shooter.

- Achieving the best stability.
- Harmonizing with the measures form helps in shooting identically every time.

First, choose a suitable weapon's height and adjust the sight to be pointed at the target via the butt pad, so if the latter raises the sight raises on the target and vice versa. Or, you can use the left-hand, as when gets closer to the body the rifle goes up, and when moving away—in the target's direction—the sight gets down on the target. Additionally, the method of carrying the weapon on the left-hand, whether on the hand grip, from the outside, or the palm, affects the weapons' height directly according to the target.

Second, the cheek rest is responsible for positioning the neck and adjusting the shooting view properly so that the front sight has to be in the center of the rear one and you to look from the middle of the latter.

Third, the weapon length (the grip being near or distance to the body) is determined according to the length of the shooter's arm and has to be comfortable when holding the weapon firmly by the right-hand—without employing any muscle.

Fourth the sight's height is determined according to the neck length so that the neck is not pressed down or extended up—it must be in a relaxation position.

Fifth the trigger's distance is chosen according to the length of the finger and should correspond to the best moment of stability as well as releasing. The more distance between the trigger and the shooter is, the more shooting time gets faster; the more it gets back, the more shooting time it takes.



Adjusting the Shooting Point (Zero Point)

After adjusting the external position and measures, we start the first step of the technique

It is how to adjust the shooter's position, point the weapon at the target, and stand in the right place to get the shooter and the weapon aimed at the target automatically—without any effort or change in the body position. Getting the best stability throughout the game and zeroing the position is also of the first step of the game plan. The shooter has to close the eyes for a long time and relax his body to execute the mentioned step correctly. We consider the zero point as the most important one because based on it the level is measured and any carelessness will affect significantly on the shooter's results—regardless of his current level.



The Zero Point

It is applied by taking the right position, not looking at the sights—but looking down as ensuring that the body is in relax position—and achieve appropriate muscle tune, and reviewing the entire body's position from the feet to the head.

Make sure to employ the appropriate muscular tension as well as the relaxation position so that the weapon's position on the right-hand grip, the cheek, the neck, the center, the left elbow, and the finger position on the trigger are all suitable.



Afterward, we are to look in the sight, see where the sight is pointing—right, left, above, or below the target—and repeat

this test about five times without any adjustment.

After making sure of the appropriate weapon's position, start making the following adjustments:

If the rifle is pointed to the right, move both legs back.

If the rifle is pointed to the left, move both legs forward.

If the rifle is up or down, adjust it by moving the butt pad back and forth, as you may find it pointed to the right or left, but not to find a change in the height. The legs breadth and center-lock, both, are responsible for the weapon height and should be fixed.

In each time, we are to take the same position, legs breadth, and center-lock; then all we need to adjust the direction is a simple move forward or backward.

That is in case the distance needed is short, but if you need to move the sight for a long distance, spin it around a fixed axis or point in the ground.

Important Note

When adjusting the zero point, maintain the relationship between the shooter and not to intervene, as if the shooter is a statue and you push him forward or backward or spin him but maintaining his external and internal position.

When making sure that the weapon or the sight is pointing to the middle of the target, emphasize on the relationship between the shooter and the weapon being strong while aiming at the target without any extra effort.

Chapter 5

Pistol

The Pistol

Pistol Shooting Competitions

10-meter air pistol men

50-meter pistol men

Rapid fire pistol men

10-meter air pistol women

25-meter pistol women and junior

Air Pistol

Air pistol shooting is classified as the basis of slow or accuracy shooting, as the shooting time per shot is not limited. The air pistol competition is at 10 meters and consists of 60 shots on paper or electronic targets for men and women, 4.5 mm caliber, the competition time is 75 minutes, and the total score is 600 points (10 points per shot.)



50-meter Pistol Men

Also, pistol shooting is classified as slow or accuracy shooting due to being at 50 meters and consists of 60 shots on paper or electronic targets using ammo of 5.6 mm caliber (0.22 inch.) The competition time is 1 hour and 45 minutes and the total score is 600 points (10 points per shot.)



Rapid Fire Pistol Men

Rapid fire pistol shooting competition is at 25 meters and two stages. Each one has three different times for shooting

8 seconds it includes two shot sets of 5 shots and 5 close targets (shot per target); 8 seconds for each set with 10 shots in total.



6 seconds it includes two shot sets of 5 shots and 5 close targets (shot per target); 6 seconds for each set with 10 shots in total.

4 seconds it includes two shot sets of 5 shots and 5 close targets (shot per target); 4 seconds for each set with 10 shots in total.

That is to be repeated for two rounds, with 60 shots in total, using ammo 5.6 mm caliber (0.22 inch). The total score is 600 points (10 points per shot)

Sport Pistol 25-meter women and junior

The 25-meter women and men pistol shooting competition is at 25 meters and is carried out on two stages



The slow shooting stage consists of 6 sets, each of 5 shots on one target, 5 minutes, and 30 shot for every set (300 points.)



The rapid shooting stage it encompasses 6 sets; each of 5 shots on one target, 3 seconds per shot, 7 seconds as a rest between each one, and 30 shots in total (300 points.)

Pistol Skill Performance

Basic pistol shooting skills include

- Applying the right position for the shooter.
- Sighting & aiming.
- Pulling the trigger.
- Control of breathing.
- Following through the pistol sights

In this book, we will discuss the air pistol skill performance (called, Mother of pistol), as it is the basis of slow or accuracy shooting.

Right-hand shooter (using his right hand in shooting) will be introduced as an example for discussing the shooting sport.

Applying the Correct Position for the Shooter

Before delving into explaining the correct position or the standing position for pistol shooters in front of a target, we must mention the shooter's optimum position and acknowledge the individual differences by which many characterizes, including elite shooters. That will be in little, limited detail concerning the anatomical qualities, physiological, and biomechanical, etc., though they are acceptable, not irregular, or far from the pistol shooter optimum position.

The shooter's correct position, as well as the correct standing position towards the target, is the basis of successful shooting; to perform a correct position, do the following

- The position and standing should be normal and comfortable throughout the training or competition.
- Employing less muscle effort and energy possible

- Having the maximum stability and balance, while having the less pistol shaking possible during aiming.
- Having the proper alignment concerning the target and enabling the shooter to point the sight easily and accurately in the right shooting area of the target.
- Applying the same position and technique every time. In case of exit or doing it once again.

Here, we will illustrate the correct position of the body parts that affect the shooting process

The Position of the Legs

Legs are like the basis of a building; if designed properly, it will remain strong and well-balanced. Meanwhile, in the shooting process, the legs should be in a correct position so that

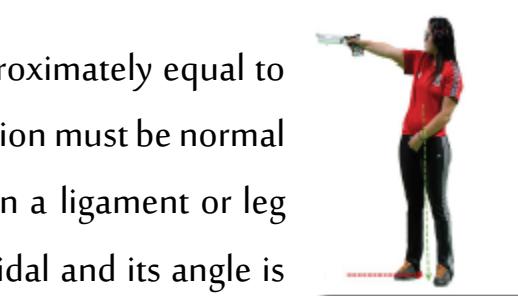
the shooter could perform comfortably and be in a stable, balanced position.



The distance between the legs should be approximately equal to shoulders width or slightly less, and their position must be normal and comfortable so that no tension or twist in a ligament or leg joint occurs. Legs' position should be trapezoidal and its angle is of 70–60 degrees.

The weight of the body must be divided equally on the legs and on the inside of each leg or slightly more on the ankles.

That position of the feet makes the body weight at the center when lifting the pistol in



the shooting position, making it almost in the middle of the two feet or slightly closer to the left one (in the case of lifting the pistol and pointing with the right hand.)

The body's angle towards the target—or, the angle between the imaginary line that passes between the two feet and the pointing line that passes from the eye to the sight to the middle of the target's pointing area—ranges from 0–45 degrees and the optimum one is approximately 22 degrees.

Trunk or upper half position

In the normal position of standing, without the pistol, the center of the body's weight is located midway between the feet, but when lifting the pistol, the shooter needs to adjust the body's position to balance the weight of the arm and the pistol. So, the shooter often bends slightly back (against the target's direction) and pushes the right thigh slightly forward.

By this method, the weight of the raised arm is equated with the pistol's weight; meanwhile, the body's weight is also distributed with the pistol's weight evenly on the feet, where, the center of gravity shifts slightly to the left foot area.

Right arm position

The right arm is the most important among the rest of the body in the pistol shooting skill, as it enables the maximum stability of the pistol during the pointing and bears the latter's weight. Additionally, it maintains the proper alignment of the pointing line between the eye and target, absorbs, and deals with the reaction produced by the pistol after the shot.

In order for the right arm to play this role perfectly, it must be in the position of shooting, the same way each time, completely straight for the following

- The distance between the eye and the sight should remain constant at each time.
- The elbow, the upper part of the arm, and the shoulder should be strong, tight, and integrated as one.
- The arm in this position can absorb the reaction of the pistol.

The Right-hand Position

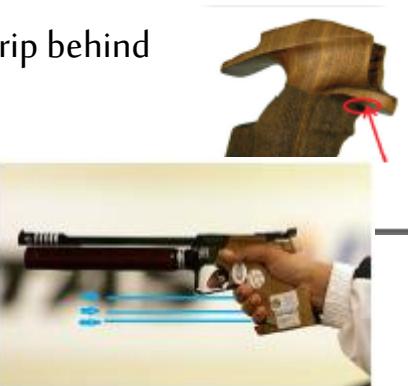
If the right arm is the most important concerning pistol shooting, grasping the pistol with the right hand is the halfway of perfect, accurate shooting.

Proper grasping means taking the correct position when holding the pistol's, modified, grip with the right hand in order to fit the shooter.

There are three main points of contact between a hand and a pistol grip that must be in their proper position



- The area between the thumb and forefinger of the hand should contact the part of the pistol grip behind the pistol pipe and under the rear sight.
- The lower area of the hand after the wrist should contact the part of the pistol's grip which the upper surface of the grip or the supporting part of the hand.
- The upper part of the middle phalange of the middle finger should contact the part of the grip under the trigger.



When the pistol is grasped during shooting, the grip should be controlled appropriately with force of the three middle phalanges

The middle finger, the little finger, and the ring finger should be vertical on vertical position and parallel to the pistol's barrel taking into account that the latter must not incline to either side.



The Left Arm Position

The left arm should not impact on the pistol shooting process and should be neutralized completely so that it does not disturb the balance or stability of the body. For this to happen, the left hand should be placed in the pants pocket, hung up, or should hold the belt. The only condition is to be in a comfortable position and be the same every time the shot is executed.



Head and Neck Position

The head is a very important part of the pistol shooting process; it is about 5 kg on average and is the center of balance and visual system. A sensitive network of many nerves, that connect the central nervous system to peripheral parts of the body, passes through it as well as many veins and arteries that feed the brain,



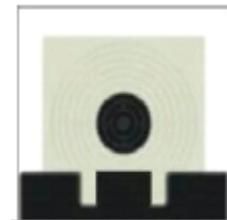
hearing, and sight. Therefore, it is to be dealt with very carefully and its position during shooting must be normal, comfortable, and balanced. When shooting, turn the head to the right, looking at the target without tilting either side, up, or down. The head position should be the following

- The best position to see the target and point on it.
- The best posture for the stability of the body's balance center.

- The best relaxing position of the neck muscles and natural blood flow through the veins and arteries.

Pointing

The correct pointing depends on the clear vision of the sight and focusing on it far more than the target or the shooting area.



The shooter should align the front sight in the middle of the area between the sides of the pistol's rear sight so that the two lateral distances are equal as well as the height of the two sights.

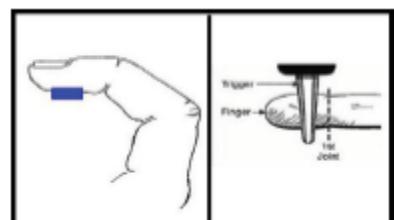
The process of shooting begins with raising the pistol to the top of the target or its upper edge; then aligning it with that area and descending slowly until reaching the shooting point, located below the middle of the black circle of the target, preferably between circles 5 and 6.

When balancing out in the shooting area, focus on the pistol's sights only without the target and on the front one greater than the rear one.

Pulling the trigger

The mechanism of pulling the trigger consists of three stages

- The first is called the negative path and ends with the stop.
- The stop: a noticeable pause separating the first and second stages.
- The second is called the positive path and ends with releasing or shooting the shot.



The first stage happens when the pistol reaches the area above the target. Before lowering the pistol, the shooter reaches the stop stage and maintains it without hesitation until the pistol is lowered to the shooting point.

When reaching the shooting point, the shooter begins the second stage of the trigger calmly, employing equal pressure without hesitation until the shot is released.

The law stipulates that the weight of the trigger (the weight of its resistance) shall not be less than 500 g and shall be tested before competitions by a special scale.

Breathing Control

Breathing is a vital function which differs from one to another.

The method of breathing control varies as well, but the most common one is

Before raising the pistol to start the shooting procedures, whether it is grasped on the table or in the bearer, the shooter is to breathe deeply and exhale quietly once or twice and then take a deep breath while raising the pistol and lowering it towards the shooting area. The exhalation process should be slow, while retaining half the amount of air, or more, inside the lungs until the shot is out.



Following up with the Sights of the Pistol

The concept of following up with the sight in the shooting process means that the shooter keeps track of the sight's movement after the shot and the end of the reaction resulting from firing and returning the parts of the pistol to normal.

Following up with the pistol's sight for about two seconds after the release of a shot is for the following

By following up with the sight after shooting, the shooter can evaluate the accuracy and validity of his previous shot from the view of the sight. Whether it

was correct, he would adjust the position or grip, if needed. After pulling the trigger and releasing the shot, it takes some time, though it is very short, to get out of the barrel. By performing the follow-up procedure and not lowering quickly, the shot is given the opportunity and time to get out completely and do not deviate, if the air pressure is disturbed due to rapid lowering after its release.

The good follow-up is one aspect of training and developing the muscular and mental memory of the shooting process.

Chapter 6

Target Sprint

Target Sprint

Technical Steps for Target Sprint Shooting

Since the target sprint competition combines running with shooting, making performance somewhat complicated, therefore, its performance should be divided into two main parts

First: shooting

Second: running



First: Shooting

The shooting process is divided into

1. position
2. pointing and pulling
3. Breathing
4. The follow-up



We will address each with a special explanation concerning the target sprint competition's shooter according to the nature of the performance.

1. The Position

As we know, rifle's shooter needs to be very accurate in pointing, so the anatomical position of the shooter is a form of bones formation as one by which he gets the best relaxation of the muscles.

The shooter's position is similar to the air gun player, but some anatomical and muscular conditions hinder the player in performing and getting the best result in less time.

A. The Feet

The position starts from the end of the running movement; it must be comfortable and smooth to take so that the player stands in the shortest time possible. The feet, in such position, are to be symmetrical and as wide as the shoulders or slightly wider to enable the player to balance and perform the position correctly.



B. The Center and Back

The center and back are identical to the rifle shooting, as the player extends his pelvis in the direction of the target and backs slightly to get the support from the spine and avoid moving any shake during shooting.



C. The Shoulders and arms

The position of the shoulders and arms should be relaxed, but as the target sprint player looks for stability and relaxation after a muscle tension resulting from running, that muscle tension affects the shoulders and arms. Thus, the player leans his arm that faces the target on the pelvic bones and the other arm on the pistol grip.

The shooter must take a position that assists the reloading process (shown in pictures.)

D. The Head

The head should face the target, so that avoid any muscular tension in the head muscles and pick a cheek rest that is suitable for that purpose during the pointing process.



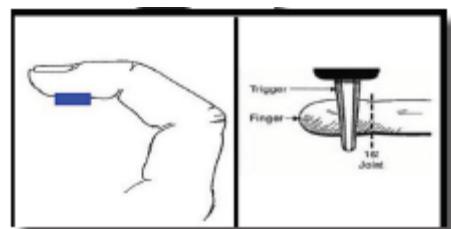
2. Pointing and Pulling

In target sprint game, pointing and pulling processes must be incorporated, as the player does not wait for good, calm, and harmonized stability then begins the pulling process. In fact, he performs a voluntary process of stabilizing and pulling due to not needing accuracy such as player air rifle player—via a good stabilizing and pulling he can hit the target.



3. Breathing

Breathing is a very difficult challenge, as the shooter must achieve stability under a very high physical effort as well as the body need of a large amount of oxygen, making the rifle move very sharply. Thus, he should regulate breathing as much as possible to try to obtain a relatively long moment of stabilization by stopping breathing for 3-2 seconds as the process of pointing goes to get a hit from the first shot.



4. The Follow-up

No performance is a follow-up free, but each varies in duration depending on its nature. The time might be very important for the players of target sprint but must know that hitting targets successfully is more important. The role of the follow-up in performance is to deliver the shot and ensure the body and its state from the moment it gets out until it reaches the target.



Second: Running

1. Starting
2. Running (initial)
3. Stopping and Releasing (shooting)
4. Running (continuously)
5. Stopping and Releasing (shooting)
6. Running (for the last time)
7. Finishing



We will be explaining the basic technical points of the hooter in the running phase of the target sprint competition.

A. Starting

The shooters stand at the starting line and then stand by for running and proceeding with the game.

The shooter starts running at 400 meters and continues according to the match management plan prepared with the coach—whether of medium or low intensity.

3. Stopping and Releasing (shooting)

The first stopping phase comes after finishing the first 400 meters in which the player is to hit 5 targets in the shortest possible time and then start off and run again.

4. Running (continuously)

This phase includes running for another 400 meters in which shooter heads to the last shooting set. The training plan varies from player to another and from coach to another, as it can be of medium or low intensity depending on the coach's preparation concerning the different running intensities.

5. Stopping and Releasing (shooting)

It is the second shooting phase which also requires the shooter to hit 5 targets in the shortest time possible.

6. Running (for the last time)

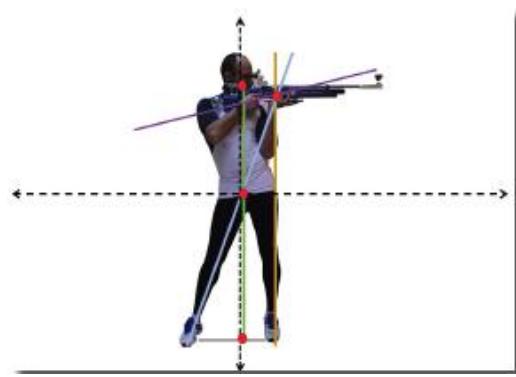
The shooter starts running for 400 meters to reach the finish line and often the maximum intensity is employed here, as the Shooter exhausts all his energy to register as short as possible time.

7. Finishing

It is the last phase that begins before the finish line at 10 m and ends after it. Here, the player should not stop, because he has almost reached the finish line and must keep going, as every second may affect his ranking in the game significantly—avoid wasting any second of the game.

The Educational Steps for Skills

We will discuss how to master those technical points essential to the player of target sprint and how to learn and master it from the beginning until being professional which affects the time of the game.



First: Shooting

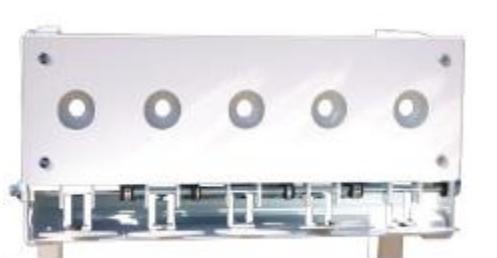
1. The Position

Basic steps that enable a player to skip the education stage

- The coach explaining the position to the player in detail.
- Making a statement of the position using positional or presentation methods.
- Having the shooters to shoot while the trainer adjusts their errors (without a weapon)
- Performing the position with a weapon while the trainer looks for errors.
- Performing the position repeatedly to memorize performance.

Afterward, the player will go through the basic learning stages of the position and the following are some exercises that make one a professional to form the shooting position in the shortest time possible.

- After running for 3 meters before the shooting line the player is to enter the goal, take the position, and repeat this exercise for 15–30 times.
- The player runs 5-3 meters before the shooting line and takes the position on the other hand, so if he holds the weapon with the left uses the other one and vice versa to increase the ability of the shooter to coordinate with all his body parts.
- The player runs for 3-5 meters before the shooting line and carries the weapon in addition to an extra weight using external weights.



2. The shooting

As mentioned in the previous technical points, pointing and pulling is the most important stage of the shooting process which determines whether the shot is a success, and therefore the player must have a good ability to complete that process successfully. Also, we will mention the most important exercises through which a player improves

- The player is to stand at 10 meters or more (e.g. 15-20) and perform.
- Minimizing the device's circles to increase the player's accuracy.
- The player is to shoot air pistol targets without running and repeat a number of shots in specific times determined by the coach depending on the degree of difficulty of the module employed to develop the coordination between pulling and viewing in less time.

Second: Running

What Varies in the Speed of the Shooter's Performance?

1. The step length
2. The step frequency

So, you should exercise continuously workouts that promote the ability of a runner and help to increase the efficiency of the fitness elements.

Some things must be taken into account during running to ensure the safety of the body and improve its efficiency

- Running in places suit running to avoid injuries.
- Looking ahead when standing to start running and raising the head to the level of the shoulders.
- Wearing proper clothes for running.
- Wearing appropriate shoes to measure of the



foot; it gives the person comfort during running and does not cause him trouble.

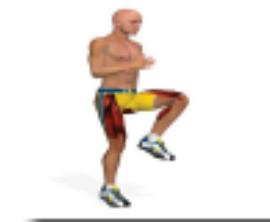
- Do not run in very cold days to avoid various diseases.
- Be aware of slipping when running on wetland on rainy days.

There are basic exercises that are to increase a target sprint player's general muscles efficiency.

There are some examples of exercises used for each specific muscle group

The Upper Muscle Group Exercises

1. Push up
2. Pull up
3. Medical ball workouts while pressing with the chest
4. Bench with the head



The Middle Area Exercises (back and abdomen)

1. Crunches.
2. Back workouts.
3. Medical ball exercises for the waist.



The Lower Muscle Group Exercises

1. Squat and jumping.
2. Rope Jumping.
3. Military training.
4. High knees.
5. Butt kicks
6. Jump jacks.
7. Side-to-side jumps.



All Body Parts

1. ABC exercises

2. Sprints

Common Mistakes of Sprint Target Shooters

First: shooting

The Position

2. Not completely standing on the feet while shooting.

Common errors

During the game, the shooter may be faster than training, but this should not be at the expense of the technical basics of shooting and running. During the competition, the shooter gets more enthusiastic and passionate about winning, which affects completely either positively or negatively, making him correspond to the routine of the competition which makes him forget the performance or do it incorrectly. The shooter must emphasize the correct performance to understand it, as it is the means of winning. Therefore, we will present some of the most common mistakes

First running

1. Short steps of the player during running due to the lack of flexibility in the leg's muscles.
2. Weakness in the speed frequency of the feet due to the weakness of the leg's muscles.
3. Leaning forward when running because of weak back muscles.
4. The weakness of the arms movement due to the lack of flexibility in the arms muscles.
5. The player cannot change the body's direction quickly in U-turns because of his weak agility.



6. Not starting well due to the weakness of the player's explosive speed and reaction speed.
7. Inability to coordinate between the movements of hands and feet because of poor coordination ability of the shooter.
8. Leaning to the back because of weak back muscles.

Second shooting

1. The player couldn't get the stability for shooting



- Lack of balance.
- The player did not pick the right place for the target.
- Poor fitness in shooter's position.
- Poor adjustment of the pistol measures.

2. the player's inability to point and pull



- Poor control of the weapon
- Over tension
- The weight of the trigger is not suitable
- The front sight is not suitable
- Blurred vision
- Wrong pointing



Chapter 7

Moving Targets

Introduction

- A. At the beginning of writing the reference during the end of 1996, moving targets shooting was the-end-of-the-line compared to the rest of the competitions, especially in terms of participants' number. In the Arab countries, members of the Arab Shooting Federation have not included the game back then. As a matter of fact, the only country that was planning to introduce it is Qatar, as the game was on their agenda for 1997 as well as making the first junior team as a nucleus to be the national team. The game was also absent in the African Shooting Union member countries. If we analyze the events of the Asia Shooting Championship held in Jakarta, Indonesia in 1995, we will find that the Asian countries participated in this competition were only 4 countries and the total number of shooters was 14—all participated in the 10-meter competition of air pistols for men.
- B. The International Shooting Federation Act of Technical Rules for the Art of shooting, in Article 6/2, states that moving targets shooting includes

shooting at 50 meters using a 5.6 mm pistol, as well as shooting at 10 meters using the air rifle.

- C. Men's and male juniors' competitions consist of 60 rounds, 30 shots for slow-moving targets, as it is exposed for 5 seconds, and 30 shots for quick ones, as it is exposed for 2.5 seconds.
- D. Women's and female juniors' competitions consist of 20 shots of slow-moving targets shooting and 20 for rapid-moving targets.
- E. The other competition is a mixed shooting, which combines rapid-moving and slow-moving targets, without knowing the type of speed expected. This competition so far is only for men and male juniors and includes 40 shots counted.

5.6mm Anschütz rifle for 50-meter moving targets shooting

Anschütz air rifle for 10-meter moving targets

The Legal Specifications of Rifles

A. Important specifications

- (1) The weight of the pistol and the telescope shall not exceed 5.5 kg.
- (2) The butt pad of a rifle shall not exceed 20 mm higher than the barrel's axis line.
- (3) The total length of the butt pad shall not be more than 150 mm.
- (4) The butt pad shall not lower down more than the barrel's axis line.
- (5) During the shooting, the butt pad shall lean against the shooter's shoulder.

- B. Any type of telescope could be used with firing rifles, but its barrel's axis line height shall not exceed 75 mm.



- C. Any type of telescope could be used with air rifles but shall have a fixed magnification force of X4, its length not to exceed 30 cm, and its barrel's axis line height not to exceed 75 mm.

Telescopes of Moving Targets Shooting

- D. Balancing weights could be mounted on the rifles with no more than the radius of 60 mm from the axis of the barrel. Those weights shall be considered among the basic weight of the rifles.
- E. It shall not be allowed to change or dismantle the weights during shooting.
- F. Before the appearance of the target, the butt pad of the rifle shall be above the bone pelvis and therefore it is necessary to put a tape on the shooter's jacket with a thickness of 10 mm and no higher than 20 mm of the pelvis bone and this position of standby.
- G. The same rifle shall be used with its fittings in both the slow and rapid shooting types without any change in any part after the approval of the weapons inspection committee.
- H. In 5.6 mm firing rifles, the trigger shall not exceed 500 g.
- I. The length of the barrel shall not exceed 1 meter with its fittings.

The Shooting Hall

- A. The hall shall have a horizontal opening that allows the horizontal movement of the target in both directions at a constant speed. The movement of the target from one direction to the other is called exposure. The sides of this opening shall be covered so as not to allow any part of the target to appear before the beginning or end of this hole. The side barriers' color is to be different from the color of the area on which the target moves.
- B. The horizontal breadth of the opening through which the target moves is to be 10 meters for 50-



meter shooting and 2 meters for 10-meter shooting. The speed of the slow-moving target shall be 5 seconds (+ 2 s for allowed error) and 2.5 in the case of rapid-moving targets (+ 1 s for allowed error.)

- C. The height of the 10-circle center, in moving shooting, of 50 meters shall be at 140 cm from the ground (+/- 20 cm) and the 10 meters be at 140 cm (+/- 5 cm) from the surface of the earth.
- D. The width of the shooting point shall not be less than 1 meter and face the center line of the target.
- E. The shooter, in the shooting point, shall be clearly visible to the public
- F. The necessary security precautions shall be disregarded.

Rules of Shooting

- A. The shooter shall be at the specified shooting point and time ready to shoot equipped with all his tools and equipment. It shall not be allowed to assist the shooter at the shooting point, nor cause any inconvenience to him as long as he has observed all the proper conditions
- B. Before the start of the competition, the shooter No. 1 shall be given the opportunity of silent shooting for a whole set.
- C. Always, the counted shots shall begin as the target move from the right to the left
- D. The player shoots one shot on each exposure.
- E. When the shooter finishes his preparations for the competition, he shall call (ready) before each test shot and the first counted shot of each set and then the referee shall move the target immediately. If the target is delayed for a period of 4 seconds, the referee shall redo the procedure after confirmation of not repeating the delay.
- F. If the target moves before the shooter calls (ready), he has the right to return. But if he hits the target, the shot shall be correct and counted.

- G. If the shooter delays in preparation and the referee found that the position allows, he could give the shooter up to 30 seconds and then move the goal.
- H. Each Shooter should have a minimum of 2 seconds after entering the shooting point to be ready.
- I. After the shooter calls (ready) for the first test shot, he shall be prevented from any contact between him and others (coach, administrative, etc.)
- J. After the shooter finishes, he shall be given 60 seconds to make the necessary corrections.
- K. After each shot, the shooter shall be given at least 4 seconds to see where the shot ended, as soon as he finishes, the next exposure shall begin. The referee shall have this process at a fixed time during all exposures.
- L. When shooting for 50 meters, the shot shall be counted and corrected in no more than 12 seconds after releasing it and the shooter shall be ready for the next operation in no more than 18 seconds.
- M. When shooting for 10 meters, the shot shall be counted immediately after throwing it and the target shall be changed in no more than 18 seconds and the shooter shall be ready for the next exposure in no more than 24 seconds.
- N. When the shooter violates the previous timing in the preparation, he shall be given a warning for the first time and a maximum of 2 degrees for each shot experiences a mistake.
- O. If a stop happens for any reason, without disrupt of the shooter, for more than 5 minutes, the shooter shall have the right to shoot 2 test shots (4 in 2 mixed shooting competitions).
- P. If the exposure ends without shooting, the shooter shall be given no points.

The technical foundations for shooting 10-meter moving targets

We meant—from the previous view of some legal, brief points on shooting the moving targets—to make it clear that the shooting technique here will be different from the previous shooting types, which features the appearance of the target and searching for it to take out the shot, but in the case of moving targets, the shooter must be in the legal standby position, holding the rifle by the hands provided that the butt pad of the rifle is to be down at the mark above the pelvic bone. In this case, the shooter should be highly aware of the appearance of the target and then places the rifle in the shoulder and points at the same time as he moves to follow the target, which disappears at the end of the exposure. So, the shooter will be under the control of the specified time from the moment the target appears to the moment of his disappearance and he has to select the best moment to release, under the influence of time pressure.

One of the most important features of this type of shooting is the development of movement coordination of the shooter to coincide with the speed of the target's movement, though any game includes two different speeds, which increases the difficulty required to master this type. However, your movement speed should be rapid as well as changing the position of the rifle in a short time to release a good shot; the movement of the shooter's performance consists of several basic movements

- Taking the proper standby position
- Raise the rifle to the shoulder as the target appears.
- Following up with the movement of the target.
- Pointing and pull the trigger during movement.

Following up and continuing Movement

- A. In this type of performance, the shooter's capabilities should allow him to build a good shooting position and then quickly changes the position, the speed of reaction, and dynamic coordination in a specific time, in addition

to taking quick decisions, and the muscular strength of the arms, shoulders, and back.

- B. The shot release has to happen automatically by all body organs during the movement so that it does not require the attention of the shooter. Meanwhile, the shooter needs all attention only when taking the standby position and then implementing the overlapping techniques of performance. This is what can be seen of the excellent shooters, as they appear to perform in an easy mechanism, but at the same time, they have spent a long time of detailed training before becoming so.
- C. The main objective of training the shooter is to achieve the proficiency of performance techniques and maintaining them, but at the same time, it requires some flexibility to meet the changing circumstances of the competition. In other words, he is to keep on performing a series of precise movements constantly provided that he will be able to make slight adjustments at unexpected changes in competitions.

D. Taking the standby Position

- (1) The shooter should know, in advance, the direction of the target's movement as well as its speed, as slow shooting continues for 30 shots and then comes the quick shooting that completes 30 shots in a separate course. Therefore, the shooter must take a suitable position that allows him to take the direction of the target's movement quickly
- (2) Since the only way to know the start of the target's movement is its appearance, the shooter needs to be in a state of anticipation so that he can raise the rifle in the shoulder immediately after the target appears.
- (3) Due to the large individual differences among shooters, taking the shooting position must be based on self-sense and nature of the body composition, but the shooter should identify the corner of shooting, the head's and arms'

position, the degree of grasping the rifle, and the angle of the barrel's height.

(4) The right hand should grasp slightly on the grip of the rifle, while the front hand should grasp lighter but keep the same position. The barrel's angle should also be constantly on the same elevation angle when waiting for the target to appear. However, we recommend the shooter to test his position to be able to raise the rifle with his eyes closed—whether the direction of movement is from the right to the left or vice versa—so that at end of the body's movement, the rifle will be pointing to the middle of the hole in which the target moves. When the shooter tests his appropriate position, it is important to consider the structural nature of his body and personal speed in turning around to follow the target and select the position after analyzing all body parts relations by which his movement coordinate according to the law and must choose the most suitable rifle for him in terms of

- The nature and shape of the fist.
- Adjustable cheek rest.
- Adjustment of the trigger in terms of distance and mechanical movement.
- Positioning the front hand.
- Optimum barrel weight.

E. Adjusting the Location of the Telescope to the Eye of the Shooter

The first appearance of the target is a guide to start moving the rifle from the position of standby to the shoulder; the shooter should always make sure that this movement is done quietly and without rush, the vertical movement from the bottom up. He also should make sure that the rifle at the end of the movement is concentrated in the same place according to the direction of the target's movement and on the line of the target's movement. That area is called the grasp

area and the shooter needs to draw attention to the way of raising his front hand and holds the rifle lightly.

In the same way each time, the front hand holds the pistol with a slight force and from the same area each time and represents the axis of rotation.

After raising the rifle, the shooter begins to turn his body around by the muscles of the center, thighs, and legs so that the movement of the rotation is coordinated and smooth. The movement of raising the rifle to the shoulder has to in the same way whether in slow or rapid shooting and the head to be in place over the cheek rest in the same way, strength, and place at a time so that it can achieve the best vision of the telescope and its center.

F. Following up with the Movement of the Target

It is necessary to follow the movement of the target after first realized and then perform the follow-up movement supported by the body muscles' movement thighs and knees, but the arms and shoulder do not have a role in that movement; their role is to maintain a steady grip on the rifle only.

The body rotation, to follow the target after raising the rifle, takes a fixed shape. If the target moves from right to left, the barrel of the rifle will move first down and then moving to the left in the direction of the target's movement a little lighter than the horizontal line of the target path; then the muzzle rises a little higher to be on the same horizontal line of the goal.

G. Pulling the Trigger

It is the decisive movement of the performance, which results directly the release of the shot. Always, there is one right moment to complete the process of pulling the trigger to get a correct shot. Pulling the trigger early or late will result in undesirable result. This moment is about 2.5–2.9 seconds for the slow shooting, while the rapid takes 1.5–1.7 seconds after the appearance of the target.

H. Following up the Target

You should continue the movement of the body on the same imaginary line of the target after its disappearance in the side to keep on moving and not to stop the performance immediately after the release of the shot.

The mentioned instance may develop automatic reactions that usually result in errors of the shot deviating from the center of the target.

When pointing with the telescope, the focus of the vision should be on the solid black circle located in front of the circular target and in the direction of its movement so that the circle becomes at the center point of the telescope's bristles.

Chapter 8

Shotgun

Shotgun

Shotgun Pistol

Shooting from an Olympic hole hunting rifle (trap), automatic launch of 200 plates.

Hunting rifle Skeet of 200 plates

Shotgun Forms

Over-and-under shotgun

Semi-automatic shotgun

Pump-action shotgun

Side-by-Side shotgun



Technical Performance

The technical performance is divided in terms of shooting moving targets (plates) into (shooting shotguns)

1. Standby Position.
2. Calling the target.
3. The primary movement towards the target.
4. Moving into the target.

Introduction

There is no essential element for producing successful performance, such as their ability to take a consistently effective standby position, which is the basis of the movement and pulling the trigger. Ultimately, the result is the shot.

Developing a steady standby position is a challenge that must be accepted as early as possible when learning shooting, as it is the basis of shooting techniques. A weak standby is like a weak basis of construction and will collapse, ultimately limiting the progress of the shooter.

As much as life varies, we can see a variety within the shooting community in regards to taking a standby. There is no one good way to take a standby, but it is possible to explain and enumerate the purpose we are trying to achieve. Knowing the purpose allows us to detail the standby position taking into account the structure of the anatomical and psychological construction.

1. Standby Position

How can we describe the standby position and all the facts of its performance?

As in teaching methods, it is useful to divide the standby position into groups of discrete components

- A. The standing of the shooter.
- B. Body position.
- C. Arms and hands position.
- D. The head position.
- E. The Place of pointing the pistol.
- F. The place of fixing the eye.
- G. Putting the weapon in the shoulder (shooting trap/Skate).

When all these elements are combined into a continuous and controlled set of events, we reach at what is needed, balanced, and appropriate to perform the standby position, which characterizes the shooter according to his personal traits and physical anatomy.

When the shooter takes the standby position, he enters the general ritual of the shooters performed prior to the shooter. Pre-shooting rituals can be described as a set of repetitive acts and movements performed by the shooter to prepare himself psychologically and physically for the shooting process.

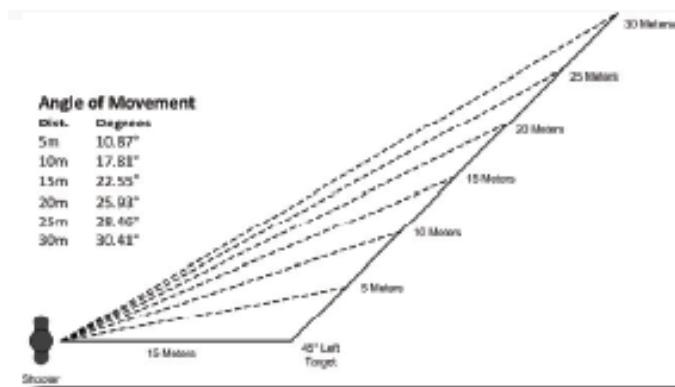
For most shooters, the psychological routine is they focus on in the pre-shooting routine, but we should not forget to what to do in the standby position, which provides fixing points for much of the psychological routine.

1) The Standing of the Shooter.

It is a personal component of the standby position. While the standby position in the trap competition ends with placing the rifle on the shoulder and the skeet competition ends with lowering the rifle, the underlying principle of the good position is somewhat common in the shotgun shooting. Trap-skeet

1. The Trap Position

The starting point of the standby position is to place the legs in a balanced, stable position. The overall shooting position is about catching the target and is located in the direction of the trap field



bottom. We need to take the range of motion to be performed by the shooter into account because of the target direction. For example, we can see the movement as an angle extending to 30 degrees in every side of the shooter; the total amount of

the movement extends to 60 degrees in trap. It's common to take the position in every situation as if you will shoot the central target of the set.

Because the targets of the set will intersect with each other within a small area in front of the middle point, taking the position forward and relatively to the center of the set gives the best guidance to maximize the movement of the shooter regardless of any goal shot.

The goal of the position is to provide a stable base for the body to perform individual movements to bring the rifle smoothly to the target temporarily and to make a successful shot. Any actions or movements that add nothing to this are unnecessary to the shooting process and need to be removed from the standby routine.

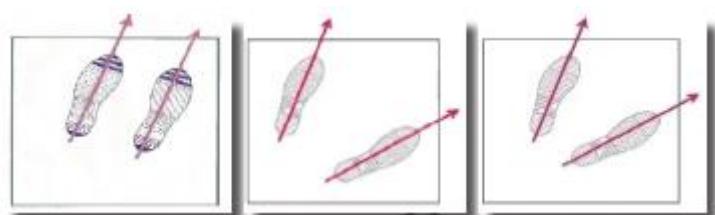
2. Skeet position

The skeet position requires flexibility in moving on the horizontal and vertical axis to complete shooting. Also, we need to take into account the need to stop when shooting double targets and then reverse the rifle to deal with the second goal.

Timing and the need for change produced by the movement requires a position that helps the body to make a smooth, balanced, and comfortable movement of the rifle towards the target.

Because the direction of the target is known to the shooter, he has the ability to catch the point at which the shot is shot.

| زاوية المركبة | |
|---------------|--------|
| المسافة | الدرجة |
| ٥ | 10.87° |
| ١٠ | 17.81° |
| ١٥ | 22.55° |
| ٢٠ | 25.93° |
| ٢٥ | 28.46° |
| ٣٠ | 30.41° |



Knowing the point of shooting, the position is meant to give the shooter the greatest opportunity to shoot while maintaining balance, stability, and ease of movement.

The main theme of a position has to be its ease of use. It is not recommended to take a different position between each situation. This does not mean that the direction of the position does not change but means that the position of the feet for some of them is constant, and it is much better to master one-position we trust.

Extrapolating the Standard Position

Each shooter has different physical construction, must benefit from its anatomical qualities, and derive a combination of positions that give him a stable base. We do not seek one-size-fits-all measures, but we can give a standard way of identifying positions that give a personal standby position for each shooter.

The simple act of standing straight requires the interaction of many muscle groups working together to make the body stable. When we enter the effect of the pistol in this equation, we ask the body to carry extra weight and adjust the body's position to adapt to this weight.

This adjustment occurs by moving the center of the balance and expanding the base through which the center of gravity operates. From this, we see that the stability of the standing results from its width, which is the connection with the feet to the overall state of the body.

We must recognize that while the movement of the shooter, we have a raised rifle by which the body creates a rotation movement that must be balanced.

The movement of shooting, by nature, includes different degrees of body parts' rotation; the hips and legs play a greater role in the skeet. We notice that the open position—where the heels are closer to each other than the front of the feet—

achieve cooperation between the ankles of the feet, the knees, and the hips, and gives control in the rotation of the upper body.

If both feet are twisted to the inside, they limit the ability of the ankles, knees, and hips to rotate and thus limit the ability of the shooter to create a controlled movement towards the target.

The Balanced Position and the V-shape Position

A good starting point for examining the position and its many differences is to look at the normal posture of the shooter and how he walks and stands when not shooting or at the speaking posture (standing with a friend).

In the identical feet position when standing naturally, it is common to have our feet slightly open, and this posture is called a V-shape or neutral one. Some may stand while his feet parallel to one another.

Keeping in mind that the purpose is to provide a stable foundation for the body to remain straight, we can deduce the features and functions we need in the position of shooting. First, the body needs to rotate through the hips' and torso's joints. The starting point of the movement in the trap competition consists of a rifle in the shoulder with a slightly tilted position for the front. As for the skeet, the position is smoother because the rifle is in the lower position and its movement, as well as the body movement, will occur at the same time.

Given that the starting position depends on the structure, strength and size of the shooter, and because the feet act as the basis through which the shooter balances, we have to check the amount of gravity's center transmission by the position of the shooter's body and the compensation weight of the rifle.

Some shooters can keep their balance even if the feet are close to each other—at least 15 cm between the ankles. The distance between the feet's front is determined according to the shooter. As for the parallel feet, it is for those who

want a wider balancing position. By compensating the rear foot, we keep the 7-shape posture but allow the weight to move forward on the front foot and create a wider center of gravity.

The images show the wide V-shape posture which gives the shooter great stability in maintaining the position when shooting the initial shot and allow more tilted, to the front, position.

The balanced position can control the amount of side maneuvering that comes from the knees and feet to the movement; it achieves greater use of the hips and upper body to control the movement from side to side.

It is also a factor in stabilizing the gun when the required movement includes a vertical movement as in situation (1.7). In time, the shooters adjust the selected position according to their demands, but starting with the standard position takes into consideration the stability of the teaching method—without introducing any unnecessary complications to the posture.

The Shoe

Wearing the correct shoe is not only important—the rules of the International Shooting Federation (tasks inspection committees)—but it is of great significance in building a stable posture for the Shooter. Choosing the suitable shoe for shotgun shooters is a personal choice and should achieve comfort and stability.



The initial purpose of the shoe is supporting the posture and enabling a steady grip in the shooting situation. For that to be achieved, some shoe's characteristics should be available to suite the shotgun shooters.

High-heeled shoe or running shoe

Any shoe of 2 cm height or more should be avoided as it creates an imbalanced and tilted position for the foot.

While running shoe is suitable for running, in the case of shooting, it puts excessive pressure on the bump of the thumb, which leads to the lifting of the heel during any rotation of the body.

Flat Shoe

It gives more natural position to the feet in relation to the position of the shooter's body. The flatness of the shoe is a personal choice but a few points should be kept in mind when choosing. The flat shoe can also be a problem especially if it is unfamiliar, as it can cause cramps in the leg muscle and in the foot arch if having no support.

Flat shoes are not common, but some specialized shoes are specially developed for weight lifting and boxing and it may be suitable for some shooters but also may create bigger problems for a shotgun shooter more than add.

Important Considerations for Shoes

1. Comfortable.
2. Supporting the foot arch.
3. Giving equal weight across the feet.
4. The heel should not be too high for the feet.
5. The shoe should not twist when the body is rotating.
6. Providing enough adhesion to the surface of the shooting hall.

B. The Body Position

When determining the position of the body to be taken by the shooter, we should take into account the general physical shape of the shooter, his center of gravity, and the symmetry of his rotation. For a shooter, determining the position of his body can be difficult because he does not have the outside view of his position

and must rely on his senses as well as his trainer; this is a crucial point, where the trainer can ensure that the shooter takes an appropriate body position.

During training, it is necessary for the trainer to correct any body-specific matters as early as possible before the shooter accustoms to the technique. Over time, many different methods of shooting have emerged. It is important to get familiar with the characteristics of current methods and know what support or oppose them. Knowing this background and understanding it, we can suggest a common set of position attributes that takes into account the needs of the shooter to deliver a successful shot.

Skeet

a) The Prone Position of the Skeet

This posture is characterized by a deep flexion in the knees to achieve a solid base through which allows the shooter's hips and knees to engage in performing a quick movement towards the target. By nature, it requires a strong muscular system and support from the legs and the lower back.



Having a low gravity center with a wide posture provides a steady base for the movement.



Using this position over long competing can lead to stress as well as the performance being unstable, so it should be combined with an appropriate level of fitness and physical preparations.

b) The Standing Position

In this position, the shooter stands still without leaning forward. It is used widely in American and British skeet. All in all, it features neither leaning nor bending, as the shooter stands still during all shooting stages.

This position provides a basic stability point due to being easy to use. It is not as stable in rifle direction rapid changing or in supporting the movement in 'doubles'. While this position is comfortable over long-time competing, it requires the shoulders and the upper body to move forward slightly. Tracking the rifle to the target might get slower in other positions so that this position is much popular in American and British skeet competitors.

c) The Kneeling Position in the Skeet

This position features a slight bending in the knees focusing on the front leg. This bending allows an easy rotation movement, as it is comfortable. The gravity center should be forward on the front leg as well as the head to provide a clear vision of the target. Additionally, this position allows the stock to touch the cheekbones prior to releasing the shot.

The degree of leaning might defer, as some shooters lower their head in the standby position to shorten the movement of the rifle—towards the shoulder.

The point of this position is to provide tight control over the process of approaching the rifle to the shoulder, where the slight bending, in the knees, is to allow rotating while controlling the rifle effectively. The upper body leaning facilitates lowering and raising the head before putting the rifle in the shoulder to move the former in a straight line, as possible of course, from the distinctive strip of the shooting coat to the shoulder.

The Trap

a) The Prone Position in the Trap

The main theme of this position is fully flexing the knees and the ankles, as the resulting strength takes part in the movement as well as rotating both joints to line the shooter's body with the target. This position can be performed by initially employing either the kneeling or the European position and finally bending the knees before calling the target.

As we see in the picture, the position completely relies on the knees, the ankles, and the hips. This relationship among joints creates weaknesses that require the shooter to have a strong muscular system to perform the position effectively; stress is to be expected in the case of long periods of training or competing. This position fully uses the muscular system of both legs and hips to direct the body to the target. Also, it can achieve a quick response towards either the target's track or other proceedings arising from the flying of the target.

b) The Standing Position in the Trap

It is the most common position in the European shooters; the shooting movement arises from the upper body and neither legs nor knees generate it, as it results from the hips and the upper body. This position includes dramatic differences in the arms position according to the body.

Raising the arms, as well as approaching them to the body, to fix the rifle's movement according to the upper body is a common theme in this position.

The shooter is to raise his arms, in this position, to put the grip in a horizontal level above the shoulder. This position is seemingly easier to keep and less strenuous, but the shooter must identify its balance point and gravity center. As the shooter gets tired, he shifts his weight to the rear leg to rectify the position which makes him shake during the shooting process, losing his control over the rifle's movement.

The gravity center's line is totally lined with the body center—except a slight drift towards the front leg.

c) The Kneeling Position in the Trap

How to determine what is acceptable as a kneeling position? Again, we can use the anatomy of the shooter's body as a basis and adjust it taking into account his balance, height, and strength. At this point, we need to consider the

impact of putting the rifle in the shoulder on the body, as it creates many variables to which the body should get used to preserve its balance.

Secondly, we will learn how to place hands when holding the rifle and deal with certain powers generated by its weight, but at this point, we should pay attention to the impact on the vertical position of the body during holding the rifle—the holding action includes twice the weight of the rifle itself.

The mentioned factors indicate the need for a position allows handling the recoil without losing the stability or the consistent control over the rifle. When combining all of this, we realize the need to move the gravity center point slightly forward in order to place 90% of the weight on the front leg.

The upper body leans forward as well as the knees and hips bend to keep the flexibility, as it and the muscular system, being relaxed, are crucial factors in allowing the body to rotate.

The Horizontal Angle of the Torso

Regardless of any adopted shooting style, we should take a closer look at the angle produced by the torso and the shoulder with the rifle.

The body doesn't form a right angle with the rifle, as it's placed in the shoulder and the former is forming an angle with the stock. The rifle/torso angle also affects the visual field necessary to line the eye of a shooter with the barrel of the rifle.

However, that angle takes part in choosing the shape of the recoil pad as well as the stress on the shooter's shoulder. As the angle gets more obtuse, the head gets closer to the end of the stock and the moving parts of the rifle. The shooter's ability to absorb the recoil without any adverse effect on the performance diminishes according to the angle as well.



As the angle gets wider according to the stock, the shooter needs a wider visual field to line the eye properly with the barrel. But a wide visual field might lead to

less effective use of the rifle and increases the practical and theoretical recoil impacts.

The Balance Center

For all shooting positions, one factor is to be fully regarded and understood to assess its success, namely the shooter's center of balance. In all shooting types (skeet and trap), having a suitable balance center is a critical factor in controlling the rifle over all the technical aspects.

When one takes a position in which the balance center is on the side of the legs' position, his body suffers to keep the position. So, he might succeed for a short time, but in the end, the rifle will shake and become unstable.

The balance center cannot be put behind the position of the legs and if so, the shooter might fall. In fact, that is introduced in many shooters who lean when shooting and miss eventually due to the unjustified leaning forward. So, they have to step forward in order to regain their balance.

As the shooter gets tired, he could shift his gravity center to the rear leg and when rising to shoot he could shift his weight to the rear ankle. The recoil movement may make the shooter shake (a shake in the rear leg resulting in losing the control over the rifle's movement). The more the balance point gets closer to the torso's center line, the more control over the rotating movement the shooter gets. The compensation of the balance center arising from holding the rifle, and its position, must suit the mentioned factor without the losing mobility.

The Position of the Shoulder

It is the place where the stock and the recoil pad are placed and is connected to the torso. It also determines the general features of the recoil pad and its physical contact effects.



The shoulder should not be raised when contacting with the stock and placing as well as raising the rifle, as that puts the muscular system under pressure exposing the shoulder to movement effects. When a shooter wants to raise his shoulder, it should be slight and enough to allow the head to lower towards the stock surface—here, we notice the poor placement of the stock. The poor placement of the stock forces the shooter to move the head, neck, and shoulder to adapt to it. Hence, it is crucial for the beginner to know how to place the rifle properly to prevent the existence of any bad habit or irritating things during competition.

The Recoil Pad

Recoil that affects the shooter may have long-term deep effects on both the performance and the health of the shooter. Some studies showed that unsuitable stocks and pads of poor quality can cause physical harm to the shoulder and that the recoil is the main reason for missing the target.

In fact, every shooter is unique in terms of physical features, but we often forget about this fact. Accordingly, we should look into the preparations of the recoil pad to meet the shooter's needs, and not take it for granted (unless it came suitable by default). As it's the only contact point with the body, we must check the desired function once we get the recoil pad to have the right effect. The recoil pad is what connects the body, the rifle, and the target and is the means through which the recoil reaches to the body. Typically, to reduce the recoil effectively, we need to identify the recoil index, as possible, according to a flat, large surface.

The contact point of the pad surface can be identified by spreading some talcum powder on it; then putting the rifle at its place and shoot. When applying this test, we see how much powder stuck into the shooting coat and its place in the shoulder.

Afterward, we could check the pad to see where the powder is, as the places that still have much powder on are the ones that haven't contacted with the shoulder for the following reasons:

- The curves of the pad do not suit the shoulder.
- The pad is really straight and contacts with the shoulder only in one point.
- The pad contacts only partly with the shoulder and most of it are not.
- The tip of the pad is pumping under the shoulder and not contact with it.

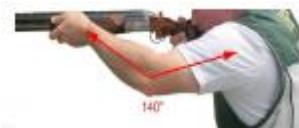
By using this powder method, we can modify the pad, by sandpaper, to suit the anatomical shape of the shooter's shoulder. We also must check the coat for any fold to avoid any issue in the contact process—by noticing the traces of the powder on the coat.

By modifying the pad, the stock might get shorter. It is best to apply the mentioned steps on a new pad to avoid spoiling the regular one that is used in competitions, as you might make many attempts to reach the desired shape.

The Position of the Hands

Holding the Rifle

It is important to place the arms and the hands properly when holding the rifle to track the target properly. The performed position should also allow smooth and controlled movement that can be performed easily throughout the competition.



Any position makes the shooter gets tired quickly is not good and should be only performed when seeking a certain goal and knowing the circumstances—for both the shooter and his trainer.

When assessing the ability to control the rifle, we should look thoroughly into the power of the rifle and how the body should adjust itself as well as its balance to adapt to the rifle's movement.

This position is a general one that is used in all shooting types (skeet and trap).

Placing the Hands on the Fore stock



Technically, we could look to the rifle as a lever and the hands as a fulcrum, while the stock as a fixed point in the shoulder. According to Archimedes principle, the place of the fulcrum is the core of the formula (compensation) of the rifle's weight with the shoulder's spindling point. Most of the rifles' balance center is one inch away from the foreshock or closer and when moving the holding hand closer to this point, the pressure of the weight lessens. While the arm's length is prominent, we could easily find an optimum point between both sides of the fore stock. The more the trigger's weight relies on the body, the less effort, by the biceps, is exerted.

In the picture collection of this chapter, we see the front hand grasping the rifle on both sides of the foreshock. Considering the angle of the arm with the trigger, we can see the impact of the 'loading distance' on the body's ability to hold the rifle.

There is a method ruling our control over the rifle, as when the arm is away from the body, our control becomes restricted due to the arms' ability to bear the weight. On the other hand, when the hand grasping the rifle gets closer to the holding point, our ability to hold the rifle becomes better but our control over the movement becomes weaker.

This impact is typically seen in shorter shooters, as they have to extend their hands after the holding point. On the contrary, we see many taller shooters use the end of the fore stock as a point for holding.



When identifying the holding point, we must assess the shooter's ability to hold the rifle comfortably and for a long

time as well as the ability to rotate smoothly and steadily. We also recognize the signs of losing control over the foreshock—through a rapid and random movement during the shooting process, as the end of the barrel shakes when moving. That happens, in the first place, when the holding point is close to the balance point of the rifle. Finally, if the holding points too far away from the fore stock, we might see an initial sign-on the drift, which arises from the lack of the articular power employed at the beginning of the rifle's initial movement, due to the extended position of the arm.

The Grip of the Front Hand

The direction of the grip is one of the personal preferences of the shooter, but we could show some different grips features and how it might suit a shooter without the other. All grips can be summed up into three kinds.

'Hands towards the Upward' Grip

In the grip kind, the weight of the rifle is focused on the palm of the hand, and the index finger might extend as if it is pointing to something. The most important advantage of this grip is being a natural one, as the wrist becomes in a better position to hold the weight and direct the arm muscles to be a better supporter.

'Hands towards the Side' Grip

The fingertips are the holding point, and the thumb can be put upward along the fore stock edge. As in the 'Hands towards the Side' Grip, the index finger might extend as if it is pointing to the target.

This grip is psychologically accepted as it points to the target, but it is not optimum in terms of holding the rifle's weight effectively though it doesn't require more than the usual strength.

The 'Standard Hands' Grip

This grip allows the hand to hold the fore stock firmly as if you hold a hammer and might differ in using the index finger to point to the target.

The strength of the grip, regardless of the type, must be enough to bear the weight and allow the arm to control the rifle and move smoothly.



If the grip is too firm, the arms muscles should relieve the tension before performing the movement.

Any type that is being chosen must be comfortable to the shooter.

The Position of the Arm Pulling the Trigger

The position of the arm pulling the trigger is highly determined by the shape of the stock and how it shapes the hand's grip of the shooter. The shooter can make a limited range of modifications, but the stock should suit the measures of the shooter's hand. Directing the hand, especially the wrist's angle, must be of the priorities of the shooter as well as avoiding the stressed wrist.



Also, the stock grip could be modified to suit the anatomy of the shooter's hand.

Some stock grips have pumps which makes the shooter feel much better as he holds it.

The stock might include a cavity for the thumb to allow the shooter more stable grip when raising the rifle in the skeet.

The main purpose of the stock grip is to facilitate the action of bringing the index finger closer to the trigger, achieving the best position for the shooter in order to release the shot without overextending the hand or the index finger.

Before raising the rifle and placing it in the shoulder, many shooters prefer to place the hands on the stock in the relaxed position in the trap. This gives a positive feeling to the shooter from the moment of raising the rifle, as he only has one step left to the achievement which is placing the stock in the shoulder.

High Wrist Position

In the high wrist position, the index finger is put downwards leaning on the trigger's blade. This position is most common with short stocks, as it allows nearing the moving parts towards the face.

Straight Wrist Position

In this position, the hands are in a straight position, the wrist is placed tight, and the index finger is extended, paralleling the vertical line.

Low Wrist Position (the grip of the pistol)

This position is the reverse of the high wrist position as the index finger is placed horizontally on the trigger's blade. This position is most common with certain stocks that allow nearing a lower position of the thumb of the hands holding the trigger. It is also common among skeet players.

The Finger of the Trigger Position

This position is a personal preference among shooters and the general instruction is to place the finger on the trigger's blade and flexing the first phalange. Using a fingertip pad is not recommended, as it is an area rich in nerve endings. While the shooter may feel that he or she has greater control over the trigger pulling process, it is also possible to have false signals or misses (expecting the shot to get out) due to the over sensitivity arising from the pressure of the game. When flexing the first phalange, we exploit its lack of nerve endings to reduce the possibility of this happening. The second phalange is not to be used in pressing the trigger. The index finger takes its position on the trigger by an angle; some of the triggers' designs allow the blade to be adjusted in the length of the drag track and the shape of the blade until it is completely on the phalange. The force required for the pressing process is up to 1 kg or more.

Using the first phalange, we ensure that the second one is a supporter to pull the trigger, which becomes more comfortable and gives movement that is more positive.

The three pictures show the perfect place of the finger on the blade. The first position on the blade is the hook grip where the blade is on the fleshy part of the finger between the first and second phalanges. This position does not give a great feeling to the shooter and is used by some as a way to reduce the probability of missing (expecting the shot to come out).

The second picture shows the place of the blade on the tip of the index finger. This position is unstable, includes the sensitivity of the finger pad, and is not an ideal one.

The third picture shows the position of the standard blade on the first phalange of the index finger. The length of the finger does not extend much to the outside but it appears slightly. The finger movement is established in the first phalange of the hand.

Using the Shooting Gloves

The use of shooting gloves when shooting gives great advantages, especially keeping a strong and safe grip on the rifle. When the weather is warm, the glove is a safe way to hold the rifle when the hands are sweaty; in cold weather, it achieves sufficient warmth and allows the shooter to feel the rifle.



Most of the gloves that are used are fingerless ones and its raw materials are able to absorb sweat for comfort and safe grip. It is thin but gives a degree of protection from cold and wind.

The Position of the Head

Face and Eyes on the Target

It must be comfortable and can be easily adopted by the shooter as part of his regular rifle fixing process. The movement of placing the head into the stock should be a single and smooth movement, as part of the rifle fixing process. The head of the shooter should be somewhat upright as he sees through the center of the glasses. Any other position of the head results in fatigue and stress and the head must not be tilted.

The Position of the Cheek

The cheek, when placed on the stock, leaves a gap of 2–3 cm approximately to the end of the stock, as a general rule of the thumb.



The Rifle Pointing Place

The Trap

The original point of all target's groups is in the front. The traditional waiting place for of rifle has developed over the course of time to include high waiting place and marks behind the shooting places.



The Traditional Waiting Place

It is to place the barrel in or above the front edge of the machine room and it gives the shooter the ability to see the flying of targets from the beginning and places the barrel at the nearest point releasing point.



This place keeps the barrel as close as possible to the flying track of the target and minimizes the conventional movement that the rifle must perform to pass through the target track.

It also places the eye on the barrel looking outward and upward, which is especially useful because it keeps the eye and rifle relationship harmonized (constant) during tracking the target.

The high Waiting Place of the Rifle

A high waiting place can be defined as any waiting place the rifle is placed on it from the traditional waiting point. Determining the height of this point is determined according to the personal preference of the shooters and can be affected by the surface design of the barrel. In addition, the element of physical ability is introduced here to some extent. Some shooters have a quick reaction and can move the rifle smoothly at the speed of the entrance by the high trap shooters as used in the double trap competitions (canceled in 2017). One of the advantages of the high barrels is that it allows the target to be seen rising from the bottom of its horizontal level and gives the shooter the ability to track the rifle to the target quickly and to see it more clearly without being distracted by the barrel that obscures the target. Typically, the waiting place of the rifle allows the shooter to make a straight move to the target. If the shooter is doing a leaning movement, we are to check the waiting place and take into account lowering it.

The Low Waiting Place of the Rifle

Some shooters in controlling the initial movement to the target used the method of moving the rifle's waiting part under and behind the trap mark. When the shooter possesses a rapid reaction, and rifle skill; moving the rifle behind the mark may compensate (equivalent to) for the jumping (as a reaction of the rifle) which might happen when releasing a shot. For shooters of high-speed rifle skill, the extra distance saves more effort and time for initiating the controlled rifle movement to the target. There is a scale above the machine room (trap); each grade is equal to a horizontal distance of one meter from the exit of the trap. By

modifying the waiting place of the rifle, the shooter can easily find a comfortable and then determine the distance.

The Skeet

The Waiting Place of the Rifle

In the skeet, we deal with a known goal track and a semi-circle throwing place, which gives us the opportunity to identify the waiting points based on our practice, and training experience. The waiting points are not usually fixed, but it varies due to lighting, background, and weather.

It is common for the following shooter to stand behind the executioner shooter as he releases his shot to confirm or mentally adjust the eye and rifle waiting points. This is an important step in preparing the shooter and using the front hand to track the movement of the barrel to the goal as well as strengthening the work.

The rifle's waiting place in the skeet depends on the speed at which the shooter can raise the rifle to his shoulder. The faster this movement gets; the shorter the rifle's waiting point will be to the target point.

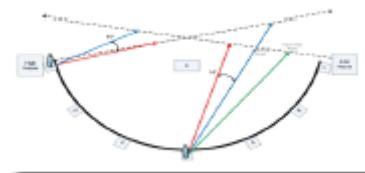


A shooter who needs more time to achieve this movement will need to adjust a waiting point closer to the target point. When the shooter does not change his shooting from a station to another, the components of the waiting and target points remain relatively unchanged—this is what can be described as the alignment triangle.

Regardless of the station or the target, there are two variables: the point of the rifle and the target's point. The base chord of this triangle has a relatively constant shape according to the deflection shooting distance (leading the target)—of approximately 1.5 meters. The actual length of this chord should also include the

distance from the waiting point to the target point. Any change in this point is a factor of the focal point of the triangle (the place of the shooters) when it moves around the semi-circle of the field.

Any change in the size of the triangle elements comes from the speed of the shooter in relation to moving from the waiting point to the target point. The faster the shooter is, the shorter the distance is. Yet, the shooter can move the waiting point back to the machines room.



This triangle also illustrates the difference between the actual and perceived deflection shooting distance. When the shooter moves from station 1 around the field, the angle of the triangle gets wider in conjunction with the perceived deflection shooting distance. In addition, at this time the base chord remains relatively unchanged indicating that the actual deflection shooting distance is not a variable.

The Distance to the Goal

The first unknown variable is the distance along the line of the target's flying where the target is hit. As noted, this can vary depending on the reaction time and the speed at which the rifle is moved because the speed of the target is fixed.

Petrov (ISSF Academy) devised a calculation method to use the total time to target as a reaction time of the shooter.

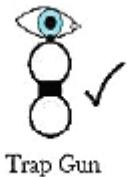
$$\text{The distance} = \text{the speed of the target (m/s)} \times \text{the shooter's reaction time}$$

In practice, the distance tends to be somewhat fixed. It can be deduced from this observation that the speed of the movement or the reaction time is constant for the shooter across all the stations, indicating that the executed movement and its timing is the same for all stations.

The Eye Fixation Place

Where does the shooter wait for the target (the distant)? How does he focus his eyes?

These two interrelated questions are frequently asked for the trainer in the training and the game, especially when the place is new, i.e. when the back and forward areas and the machines (dishes) are not familiar to the shooter.

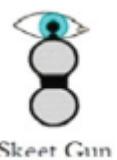


Trap Gun

These questions have many answers according to the underlying circumstances but coaches have to provide their shooters with a comprehensive understanding of how to determine the right and the wrong.

The Eye Height above the Surface of the Barrel

In the trap shooting, all targets rise so we must look above the level of the barrel surface to determine the target's track. The height of the eye above the surface of the barrel is also a major determinant of the shock point. The normal training for the trap in determining the height of the eye is to adjust the top of the wooden body so that the bottom of the iris is based on the top of the barrel surface when looking along its length. There are differences in this place as a part of the iris is blocked or most of the sclera is visible along the barrel. In general, the difference is approximately one cm.



Skeet Gun

If the eye is significantly higher, that the bottom of the eye or cheek is visible above the surface of the barrel, the shooters jeopardize to have a visual separation (between their sight of the rifle pointing and the target).

In the skeet, the well-known track of targets makes the waiting point of the eye a thing that can be calculated and estimated from one station to another. The target track gives a line or chord of a circle to see the target on. Also, we know the track, so we can point the eye waiting point to include the flying line of the target.

The variable action is determining the target flying point. This distance from the machine room will vary slightly from one station to another so it is important to make sure in choosing this point.

As in other shooting types, the background plays a part in making this decision; the reaction time of the shooter and the waiting point of the rifle also have a direct impact.

In skeet shooting, the height of the eye is relatively low when compared to the height of the trap. The key component of the track of the targets is relatively superficial so that a 50% collision point can replace the need for a high point of collision. The shooting point will be defined as being without vertical compensation—like the target track.

Other factors should be considered when the eye is low on the surface of the barrel and blocked by the surface or the moving parts of the rifle (the bolt). The moving parts and the stock will mostly block the eye vision. This surface can be also used for targets where the flying is horizontal to the level of the barrel's surface (the stock's surface) as in the skeet. As for the high targets, the shooters need to see the targets. Using the low eye position on the surface of the barrel, we must close the perceived gap between the barrel and the target until we complete the shot. As we do that, we should obscure the target's track before pulling the trigger. That is an important consideration should be taken into account when the shooter chooses the low eye height. When the optical connection with the target is lost, the head may rise above the stock trying to regain the target. That causes a change in the shooting point of the rifle and probably leads to a missed shot (what the eye sees the rifle does not).

The Coordination between the Rifle and the Dominant Eye

Coordination the Rifle

Coordinating and adjusting the rifle to the eye of the shooter is very important in shotgun shooting due to not having an adjustable rear sight so that the shotgun-rifle is adjusted to one shooter only and cannot be used by another shooter—that was in the past.

Now, the weapons manufacturers have developed the stock (the wooden piece on which the cheekbones are put) so that the height and direction can be changed.



However, the majority of shooting champions prefer to have their own stocks according to their personal characteristics in terms of wood color, the shape of the grip, and positions of their fingers to avoid any weather change. In the case of extreme heat, sweating leads to dropping the grip; while in the rain, the hands slip because of the water.

Adjusting the Rifle

A rifle can be adjusted in several methods, including the old ones, which are used so far because of its effectiveness, and the modern.

Adjusting the Rifle by a Control board

In this method, a wooden 1 x 1-meter board (or metal) is placed at a distance of 20–25 meters; a white paper with a black square (5 x 5 cm) in the center is to be attached to the board. Then the shooter is to release a single shot and check the black square for the smokeless powder of the shot in terms of height and direction. As a result, the error is corrected either by adjusting the position of the shooter's cheek or the stock.

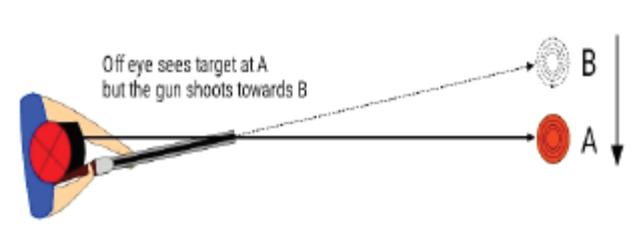
Adjusting the Rifle by a Trainer or Specialist

In this method, the shooter asks the help of his trainer or a specialist in determining the eye point on the rifle. The shooter places the rifle in his shoulder, takes a ready-to-hit position, and closes his eyes (so as not to correct automatically). Then he opens his eyes when the trainer is in the opposite direction to see the eye of the shooter when opening and determine the degree of deviation from the barrel axis. The trainer (specialist) is also to identify the cause if it is due to the head position in terms of descent, height, or inclination to one of the sides and correct the position—if it is caused by the shooter's position—or adjust the shape of the stock.



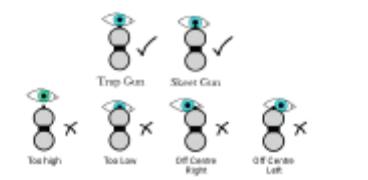
Adjusting the Rifle using the Laser Beam

In this method, the testing shot is used, from which a laser beam identical to the barrel's axis is released. The shooter points to the black square by the rifle and if the laser is pointed at the same place, the rifle is accurate. If there is a difference, a correction is done to match the point of the laser beam either by adjusting the head position or the stock position.



The Ocular Dominance (the dominant eye)

It is important to determine the right dominant eye as early as possible for the shooter in his career. A late diagnosis of the dominant cross eye makes solving the problem very difficult if not impossible.



The 'ocular dominance' term is the tending to use one eye than the other. Approximately, 2/3 of the people who have dominant eye are using the right one.

This also varies according to age. The dominant eye changes at different distances between some shooters.

The significance of ocular dominance in shooting cannot be underestimated. The dominant eye should be aligned with the rifle barrel. It is the eye used in providing accurate spatial perception and spatial information.

Choosing the dominant eye is straightforward and easy to perform, and there are many different methods that give direct eye preference whether left or right.

In a small number of cases, determining the ocular dominance can require a test executed by a specialist—if there is any doubt.



Method of Determining the Dominant Eye

1. Dolman Method (hole-in-the-card test)

The shooter is given a card with a small hole in the middle and asked to hold it with both hands. Then he is asked to look at a distant goal through the hole with both eyes. In this process, the shooter closes his eyes alternately or approaches the hole slowly to the eye in order to determine which eye sees the goal (the dominant one).

2. Near Convergence Near-point Test

The individual focuses his gaze on a target moving it towards the nose until a one eye drifts (i.e., the non-dominant eye).

Correcting the Ocular Dominance

The mind determines the ocular dominance but we cannot either maintain that adjustment or use mechanical intervention to either shift or change the dominant eye. In most cases, we will end up dealing with shooters who have a cross-eye command, which is the left eye is dominant, but they shoot with the right hand and shoulder.

Ways to Correct Ocular Dominance:

1. Change the shooting shoulder
2. Close or narrow the dominant eye
3. The hiding (blocking)
4. Optician
5. Placing the weapon in the shoulder (trap/skeet shooting)

Raising to the Shoulder

The standby mode for trap shooting consists of three stages:

1. Starting mode.
2. Raising the rifle to the shoulder stage (placing the rifle in the shoulder).
3. The final mode before calling the target.

During raising the rifle, the barrels safely point down the field (towards the depth of the field) at all times.

The starting point for the rising action is locking the rifle. At this point, the hand of the trigger lifted the rifle vertically while the front hand lifts the barrels to lock the moving parts (bolt) in a controlled manner but without rushing (fast or violent movement). In this position, the front hand is higher than the hand of the trigger, so the barrels point up at about 30 degrees with a comfortable and stable grip.

For the skeet, the end of the barrel is located at the bottom or on the expected flying line of the target. The position at this point is normal because the shooter prepares himself (calms down) before completing the rifle placement in the shoulder. It is essential to complete the following movement and the final one smoothly and positively.

Placing the Rifle in the Shoulder (trap)

Putting the rifle in the shoulder has become a personal act with many variations. The foundation of all different forms is bringing the rifle to the same point in the

shoulder with the head pointing and ultimately the eye in alignment with the barrel surface.

The Low Barrel Position

In this form, the rifle is directed out and down several meters in front of the shooter. The shooter leans forward from the hips and the moves back the stock of the rifle to the shoulder. The shooter then raises the rifle upwards to the machine room and bends backward to adapt to the movement. This method is inherently unsafe because it involves guiding the rifle down in the ground just a few meters from the shooter which presents the risk of ricochets. Consequently, we should eliminate using this position (it has been mentioned to illustrate the methods used only).

The Vertical Barrel Position

This method has several benefits in fixing the rifle, as it allows the shooter to place the stock at the shoulder cavity as well as keeping a strong contact between the stock and the cheek.

In this position, the rifle is raised that the end of the barrel is above the head level. In this mode, the rifle is placed in the shoulder in one movement and the barrel is lowered with the head placed on the stock. This method has been adopted by some very successful shooters. It has different shapes on the vertical structure that can include a starting position adjusted to the side that moves through and under the mark.

Regardless of any method used by the shooter, stability is the basis of this position. It requires training and dedication to be mastered as it can contain more movement than horizontal placement—it must be repeated consistently and accurately.

The rifle now is in the shoulder and head is in a horizontal position with the ground. The rifle can be lowered to the selected point of view.

The Horizontal Barrel Position

This is probably the most common and easiest method to learn for new shooters. It also has the advantages of a few movements which is placing the head in the standing position or the neutral one on the stock. It also requires less re-positioning of the body to bring the barrel to the waiting position.

The horizontal position relies on placing the rifle to the front that is almost horizontal. Afterward, the upper part of the torso is tilted forward because the neck and head are pushed forward. The rifle is then drawn so that the butt pad of the stock is placed to the shoulder at the same time as the top of the stock slips down the cheek.

The rifle now is in the shoulder and head is in a horizontal position with the ground. The rifle can be lowered to the selected point of view and the shooter is ready for the next stage in the technique of shooting.

Calling the Target and Moving the Rifle

Placing the Rifle in the Shoulder in the Skeet Shooting

Putting the rifle in the shoulder is a synchronous action with the rifle movement to the target. So, it is a more complex set of individual acts performed at the same time.

The rifle is directed so that it is placed in front of the center line of the body. This has the advantage of placing the rifle directly in the shoulder as well as employing the deflection shooting technique during flying.

Two distinct types of movement are included. From station 1 and 7 of the first goal, we can direct the body to the outside so that the movement is vertical in station 1 until the target reaches from above the head. The movement to the shoulder is a linear movement, directly vertical, and without a side component.

In station 7, the same movement is applied but the target rises from the bottom. In both cases the movement is minimal.

There is no need to possess a horizontal component; if we introduce an unnecessary step that can lead to a missed shot (zero).

In all other stations, there is some horizontal movement to bring the rifle to the shoulder and achieve the correct pointing. This movement is not of the steps, but a coordinated action and if divided into individual steps, this can create queues in motion that lead to loss of the controlled movement. When teaching this movement, it is best to start as slowly as we do with any complex skill. The movement speed can be realized when the technique is mastered as a natural result of continuous training.

Calling the Target

The final action prior to shooting the target is calling it with which the shooter starts. Historically, the word "call" is used, but the rules allow any sound that is clear and audible enough to operate the microphone.

Many different types of calling are used, while sound launching systems tend to be very powerful in their operation. There are certain types of calling that can cause a slower launch of the targets (slow start) and another that puts pressure on the body of the shooter.

Before examining the different types of calling the target, let's examine the purpose of the calling from the scientific perspective. The call is used to launch the target from the machines and the microphone that is placed beside the shooter's legs intakes the sound of calling and transfer it to an electric power full of volts that is used in the traditional engine of the machine. A certain amount of electric power is required in volts and some systems use an electric circuit to filter sounds from the field to prevent operating the machines to any random sound. The electric power of volts in the microphone is generated by the movement of the cover material or the membrane that vibrate when air pressure is generated from

the sound of the shooter. If the calling is very weak, the generated force, in volts, is either insufficient or late.

Types of Calls

The range of calls used is large and different, but we can take some of them, with the most obvious characteristics and qualities, and examine them in more detail.

Calling from the Diaphragm

The main feature of this calling is being generated from inside of the diaphragm and the lower body. The purpose is to exclude the chest and torso in the calling process which in turn can reduce the stress of the muscles in the torso. The output sound is like muttering and tends to be longer in frequency than the standard launching call.

The Escalating Call (increasing in intensity)

This calling is a sound rises from low to high intensity at the target launching point. The purpose is to create a controlled launch at some point in the calling process. This calling can experience slow launching issues, as the target is launched at the point of the gradual increase of the call, and it can vary from station to another and from field to another.

The Standard Call

It is the most common type of calling which uses the word "call" as a sound and focuses on the first two letters (ca), which creates a sharp sound. However, that sound is captured by the microphones and its intensity, as well as loudness, creates an effective mix as a standard calling.

The Basic Characteristics of the Call

After examining the calls, we noted the demands of the voice editing system. We thus can begin to evaluate the main characteristics of the calling.

a. Clarity

The call must be clear and uncomplicated. In the case of "no call", the referee must be able to hear clearly the call for the target. Also, it has a definite action which can be well integrated with the pre-shooting stage.

b. The intensity of the sound

The intensity of the sound must have enough power to operate the microphone but not so high that he is forced to shoot. The sound intensity of the call is preferred to be fixed than to be high or increasing gradually because it gives a more reliable and consistent calling.

c. Ease of production

It is necessary for the shooter to consciously think about his performance; the calling process must become a regular work that is too trivial to be realized by the shooter, as it is a key component of a successful shooting technique.

d. Consistency

The calling must be repeatable and consistent in its performance. The same call is required from one station to another and from one field to another.

e. Motionless

It is important that the call does not move the rifle consciously or involuntary and we must make sure that the rifle is kept stable and motionless during the call. The movement of the rifle at this point can cause a shifting in the focus of the eyes to the moving barrels at the same moment as the target gets launched from the machines room. This is a condition that should be avoided and can be difficult to overcome if the shooter developed that habit early in his performance (style).

The shooter must not link the calling to the movement towards the target. This is a common problem in the game, especially when the shooter is under pressure or anxiety.

f. Seeing the target

The optical characteristics of the target vary due to weather and lighting conditions. During poor lighting and cloudy days, the target can be perceived as being smaller and can create the impression of being faster than its real speed.

We must rely on the many hours of training to avoid confusion and modifying our technique reversely as we focus on imaginary something that is not present except in the mind of the shooter.

The target appears and very little of it is visible and we typically see its side. This visual effect is directly related to the impression of over speed. We must allow this and assure the trainee that he is well-trained for such a thing. The opposite happens when we have an excellent vision and a good background, as the target may appear slower and more visible to the shooter which gives him the impression that he has more time to shoot on the target. This causes a lack of attention and a missed target (zero) as a result of shooting behind the goal.

The shooters must spend time checking the targets in the field before shooting. They must use this time to observe the background effects as well as lighting effects on the target. We must avoid surprising when calling the target; it will cost us targets and destroy the confidence of shooters early in the round.

g. Opening both eyes

Keeping both eyes open during shooting gives us many advantages beyond what was stated. Our eyes are set to work concurrently and provide a better vision. This gives us the ability to estimate speed and realize the depth and distance to the target. When we close our eyes, we weaken our ability to perceive depth. This creates an obstacle for us in determining the track of the flying target and creates a limited scope of vision. Our eyes work together to create a visual image with no high-dividing lines. When we close one eye, this image changes and then we see a

smaller area of vision, which is tied to one side by the nose and the stock of the rifle.

The Initial Movement of the Target

The first movement of the shooter must be controlled and sequential. These words are easy to say but are much harder to implement and adopt within the technique of the shooter. After keeping the rifle stable during the calling period, the shooter begins the initial movement by involving the upper body and shoulders via moving the rifle toward the target. This is a coordinated movement including all the major muscles of the upper torso, back, and legs. It is difficult to analyze individual movements and it may be better to describe the overall effect and purpose instead.

The purpose is to create a smooth and controlled movement that causes the rifle barrel to reach the target more quickly than the target within a short period of time, which might up to approximately 5 seconds. The main theme of this movement is the time available for performing the movement. If we take a long time, the goal will move behind the best shooting place. This place will be the best point of the model and the optimal power point for the shot. This distance is generally measured as a 25–35 m distance to the target.

The Synchronized Movement

The arms and body must move together in a synchronous motion to maintain correct and accurate alignment of the eye along the surface of the barrel. We must avoid using the arms to raise the rifle towards the target in order to make a sudden correction to the track of the rifle movement.

The final result is the possibility of seeing the stock moving from the cheek, creating a visual separation between the rifle and the target. The term "shooting by the arm" is a direct reference to the style of the shooter in which he draws the

rifle to the target using the front hand as a driving force. He should get used to using the front hand only as a supporter of the rifle. Some shooters consciously attempt to achieve this by deliberately using the open hand technique to avoid over grasping the fore stock.

It is best to get used the proper use of the front hand as early as possible to develop the technique of the shooters. Dry-fire practice and simulations can have very positive results in enhancing movement coordination.

Moving to the Target

"Smooth and controlled movement"

This movement is characterized by a controlled and smooth movement to the target. The range of angular motion can be up to 30 degrees and requires the shooter to be comfortable on this range and more. In more simple terms, moving to the target consists of a controlled and smooth movement and perhaps we need to dig deeper into what happens physically as we do this movement and the factors that arise.

Factors of Mutual Connection (during the movement period)

- The Speed of the target
 - The direction of the target
 - The speed of the rifle
 - The time for target
 - The position of the body
 - The balance centers
- i. **The speed of the target**

The speed of the target is relatively constant on all target tracks and varies between 96 to 106 km/h. Based on this, we can see a 10% change in speed which is equivalent to a 0.1-second change in the timing of shooting. The speed may

seem to change as the angle changes. The targets that are straight in its tracks, from the perspective of the shooters, seem to be moving slower than the targets that have angles on the track.

ii. The direction of the target

Some target's tracks are easier to expect than others. Targets with shorter and higher angles give greater resistance and require more time. The problem is that the shooter may think that he has more time to shoot at the target. As noted in the previous section, the difference in speed does not exceed 10%—so the distance along the target track is only slightly different.

iii. The speed of the rifle

The shooter is responsible for the energy required to start the rifle movement, as the ultimate goal is to control this movement and perform it smoothly. A relatively large amount of energy is required to start the movement and this is the inertia of the rifle.

The first law of Newton

The inertia law: "The body maintains its speed and direction as long as there is no force affecting its direction of movement".

Based on this, we can see that the initial movement of the rifle provides individual strength which gives an amount of movement to the rifle. The following forces used by the shooter are not necessary to increase the rifle's speed according to the target as the initial movement will cause the speed to exceed the speed of the time-based target. If a continuous force (inertia) is used to move the rifle, we will have enough speed to hit the target within a distance of 20–30 meters. During the transition phase, the forces used are to control the track of the rifle only and not to speed it up towards the target. This underlines the significance of the initial movement in achieving complete success in the shooting process (the shot).

iv. The time for the target

The time spent during the movement towards the target is normally calculated from the moment of the call. Assuming that the time spent before the start of the movement is relatively constant; we can then look at the movement towards the target and its timing separately.

The time for the target describes the speed of the rifle according to the speed of the target. It is best to look at this sign from its angular component. When the rifle rotates through a curve to the target, it passes an angular rate of change, which can be expressed as degrees per second. This angular rate must be fast enough to bring the rifle to the target within 0.4 seconds. For wide-angle targets, this can happen only through the application of greater inertia which can lead to an uncontrolled and non-smooth movement. The alternative can be seen as preserving the smooth and control by the initial movement which is just enough to create a continuous force (inertia) to catch the target. In addition, if the shooter is trained on a constant timing, he will shoot the high-angle shots almost as quickly as he does with the front target and he will benefit more than using the rifle's angular movement as the timing for the target because he will shoot a smooth and controlled shot.

v. The position of the body

You should not forget the effects of the movement on the overall body position. The initial movement arises from the shoulders, torso, and hips. From a static position, the movement creates pressure on the body in the opposite direction of the movement, which is resisted by the muscular system of the body. If there is a weakness or lesser resistance at any point during this movement, we will be able to notice the signs through the changes of the body's position.

We have to look for major changes in the standby mode. One of these movements may show itself when the shooter assesses his/her body before moving to the

target and it can change the balance center of the rear leg. The hips may also move backward as the shooter leans forward.

The shoulder rotation

One key feature to look for during the initial movement is the shoulder rotation towards the target. The reason is the resistance or the inability to complete the full range of motion necessary to reach the target as well as the final movement via tilting the upper body exaggeratedly, which also involves with arms in releasing the shot. Some shooters can continue to perform to a high level even though they suffer a clear shoulder rotation, as that became part of their technique and the coordination required to perform the shot has been learned and controlled by the muscular system. It is best to deal with the shoulder rotation early before it becomes a part of the technique. Remember, even though he may hit the target, the rotation is a component of the technique, which disables most of the body's ability to move in a more comfortable and accurate way.

vi. The balance centers

As the shooter spins, there is a useful frontal adjustment in which he shifts the center of the balance by 10-20% more on the front foot. When exaggerating in this movement, the balance moves forward and the shooter is to lift his ankles from the ground to compensate. This is better observed when the shooter gets a missed shot or expects the shot to come out, as he steps forward to gain balance.

The reverse effect can also occur when the gravity center shifts to the rear foot which impinges on the position. The same effect becomes obvious as the weight of shooter moves to catch a higher target, relying on the rear foot. The movement thus suffers a loss of control.

The final result of not aligning with the balance center is an uncontrolled corrective movement by the body and increased loss of rifle control. Balanced body position is essential during the movement towards the target. Any additional

correction or extra effort during this stage will increase the odds of a missed shot (zero). In this case, the second shot is to be released immediately, as the mentioned effect creates a less than ideal starting position for this shot.

Leading the Target (Deflection Shooting)

Leading the Target in the Trap

The rifle moves at a faster angular speed than the target and it will reach the target and even exceed it—if its speed is much higher. We do not bother about the deflection shooting of the shot because its speed, when the rifle reaches the goal, gives an integrated speed, which is enough to break the target if the shot was released within the normal distance.

The common term for this is 'touching the target' which is the barrel's end of the optical point in contact with the target where it deviates. If the shot is released at this point provided that the rifle's speed is not reduced or stopped, the shot will have sufficient speed to lead the target for a successful hit.

Leading the Target in Skeet

The effect of circular shooting places gives an interesting phenomenon similar to the actual or relative deflection shooting. The position of the shooter for the target track changes from being close to zero degrees at station 1 to 90 degrees in station 4 and therefore the deflection shooting value of the target must increase in distance as the shooter moves around the semi-circle of the field. The actual deflection shooting value is a fixed number depends on the speed of the target and the distance from the target to the shooter and the speed of the shot. The speed of the shot and the short change in the distance between the stations and the target makes this value approximately 1.5 m.

In his book the "Art of Skeet Shooting", Tonino Blasi developed a mathematical calculation of the actual deflection shooting value and highlighted the difference between the perceived and the calculated one.

The deflection shooting value = (the machine room's speed ÷ the shot's speed) × the target's speed

Example: $(22 \div 340) \times 19 = 1.23 \text{ m}$

The following figure of the angular displacement required for leading the target shows the effect of the perceived deflection shooting value and how it makes itself visible to the shooter at the station. When the shooter moves around stations 1 to 3, he becomes more vertical on the target track and the perceived deflection shooting value exceeds the calculated or the actual one.

The Figure of the Deflection Shooting in the Skeet

The perceived deflection shooting value given to the target is a factor of the angle the target adds for the shooter's angle. When the shooter is at station 1-2, the target's angle for the shot creates the impression that a less deflection shooting value is required for a successful hit, and this is the alignment triangle.

The Eye/barrel/target Relationships

For many shooters, these are difficult to explain and often stated as a feeling or sensation that it's time for pulling the triggers. Also, they are combining the three things in the mind to stimulate the mental response of the shooter to shoot.

The first one, eye-to-barrel relationship is fixed and must be maintained for proper shooting. Any drift or slip in the barrel tilt can modify this relationship, causing the shot to be placed behind or below the target.

Second, when the barrel reaches the target, we feel that the movement between the barrel and the target has slowed down. This is an optical perception that can create a deception that the goal is going slower than it actually is. The result is that the shooter slows the movement and the shot is placed behind the target. The key factor at this point is to push the barrel through the target and when it touches the target, we pull the trigger.

Pulling the Trigger (squeezing the trigger)

For many, pulling the trigger is taken softly and is not fully examined as part of the overall technique. The long-term work of pulling the trigger includes all the preparations and such as bringing the barrel to the target to reach the final result. The weight required releasing the shot and the length of its track can vary and have a significant impact on the shot. If the force required to squeezes the trigger is intense, the result is a big muscular effort in the hand and the forearm to release the shot. If the required force is light, the shot might be released unintentionally. The length of the track of the trigger can be adjusted to suit the demands of the shooters.

Expecting the Shot Get out (missing the shot)

It is the involuntary ability to pull the trigger or release the first or second shot and it can be seen as a reaction of the body to the expected, distinct bounce and the actual bounce. This is a situation that we must be aware of its early signs. It may weaken the technique of good shots in some way. When we examine the reasons for this phenomenon (expecting the shot to get out), we notice a common theme which is the shooter has an over mental load. This overload is caused by unexpected events in the timeline of the shot, and also by the pressure of the game and anxiety. The solutions for this phenomenon may include the use of the middle finger squeezing method—as noted in the picture.

Methods of Squeezing

There are two common methods of squeezing the trigger in shotgun shooting:

1) The Slapping Method

In this method, the trigger is pulled quickly by the index finger; it is a serious form of pulling the trigger. If the shooter is really excited, this method can lead to missing the shot (expecting of the shot to get out) due to the sudden nature of the slapping.

2) The Fixed Contact with the Surface of the Trigger

The movement is a light one but the index finger does not leave the surface of the trigger. In this case, the fixed contact is maintained with the surface during the negative movement of the trigger after the first shot.

Following up and removing the Rifle (returning to the standby mode)

Once the first shot is released, it is essential to retain the forward movement of the rifle to allow the second shot to be released in case of missing. If the rifle's movement stops when the first shot is released, the movement must be started again before the second shot is completed. The output is likely to be an uncontrolled and intense rifle movement which can be described as "stabbing the target" and the head may rise above the stock to gain the vision. Hands may also be used to release the second shot.

An easy way to test this mode is to put a silent (false) shot without powder in the rifle, and when the shooter brings the barrel to the target, we will see more clearly if there is an expectation or vibration of the rifle. This also indicates whether the forward movement of the rifle is maintained.

The amount of follow-up in the skeet should remain the same regardless of whether the target is individual or double and remember that we do not want to create two separate shooting processes. In the double targets, we cannot afford a long follow-up because we will lose time and increase the distance to the second target.

Removing the Rifle (returning to the standby mode)

The final work of the shooting technique is to take down the rifle which requires the completion of the firing cycle and needs to be a positive and rehearsed action by the shooter. If the shot fails (zero) and the shooter begins to show a negative reaction to the shot, the chances are that he repeats the error and increasing the

result of the previous shot. The shooter should not give attention to the result of the shot; the missed shot (zero) should always be treated as a successful one. The shooter should also take the opportunity to check the rifle briefly to ensure that there are no failures and that the barrels are clean and empty (free of impurities).

Chapter 9

Maintenance

The regular maintenance of the weapon is the most important factors that the trainers must take into the account, as it has an important impact on the level of the shooter and neglecting it may cause a loss in the efficiency of the weapon. Thus, you always have to make regular maintenance, which is two types:



1- Daily maintenance

It is checking the player and ensuring the safety of the weapon before and after the training and taking care of the special cleanliness after the training according to the type of competition.



2. Complete maintenance

In which the trainer or player:

- i. Test the efficiency of the weapon and its parts.

- ii. Test the speed of the weapon.
- iii. Do the internal and external maintenance of the weapon
- iv. Choosing the suitable type of shots for the weapon.

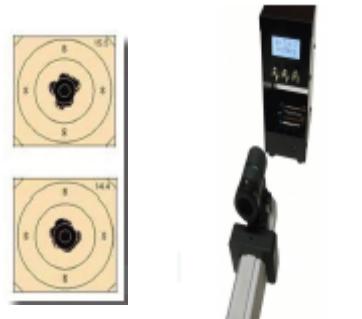
This operation has to be carried out before the training camps or before preparations of the competitions at an appropriate time .



The maintenance process of the weapon is considered as one of the most important points that the trainers must pay attention to, as it may affect the result and change the course of the games. The maintenance is a regular process, which keeps the efficiency of the weapon. The most important points to be ensured by each trainer towards his team—and there are many trainers do not know the technical condition of the internal parts of the weapons of his team. All of this is a wasted result.

1) The Cleanliness of the Weapon

It is regular cleanliness of the weapon, which is conducted every (6 - 21) month in which the player, under the supervision of the trainer, cleans the weapon and lubricates its moving parts.



2) Adjusting the Speed of the Weapon

Always check the speed of the weapon in terms of the stability in changing between shots. Check if the shot's speed is suitable for each weapon so that it does not cause a defect in the reaction of the weapon.

You should clean your barrel after about every 500 shots.
Air rifles should be serviced once a year.

3) The Caliber Size

It is choosing the suitable powder type of the weapon, which achieves the best result according to the potentials of the weapon and is the most important element in accomplishing the result of the performance of the shooter.

This process is always carried out before the camps. The regular checking of the selected powder type can be also during the training camps. When the player selects the suitable type of powder, he must keep training using it for a proper period before the match until he adapts to the type of selected caliber.

Maintenance of the Shotgun

Rifles require a lot of maintenance in order to keep its regularity at work.

Tools and materials used in the cleaning process:

Pipe Cleaning

- Small wooden stick with links can be installed on its front.
 - Brush of rough copper and any oily material to remove rust and the glued carbon stuck into the interior pipes.
 - Soft metal wire brush as well as adding the weapon oil to clean the weapon and melt any stuck materials inside the pipes.
 - Brush of cloth to clean the pipes from the inside, polish it, and wipe it from oil.
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Clean the moving parts and the extractor (which is responsible for emptying the shots from the ejaculation port of the gun).

Spray the oil-resistant material for cleaning and polishing.

Wipe the barrel carefully and then add the weapon oil to remove the rust, as it is harmful to the moving parts when left for a long time on the surface.

Wipe the weapon carefully of the oil and then add grease to facilitate the movement of the moving parts and preventing corrosion.

Cleaning the Wooden Parts

It must be wiped well by a dry cloth to remove any dirt.

Spray any material to polish the wood (Bulldog) and then use the toothbrush to clean the hand grip in order



to prevent the accumulation of sweat and dust which results in deposition of dust on the rough surface. That surface gives the grip the stability and strength to not slip or move in the hand of the shooter or becoming a smooth surface that is hard to control. The shiny material of the wood has to be carefully cleaned so that the color of the wood is fixed and not to leave different colored stains. Afterward, place that material in its plastic or wooden box. Maintaining these steps leads to consistent endurance of the rifle as well as longevity.

Chapter 10

Disabled People

General Rules

1.1. Competitions

1.1.1. The competitions Known to the International Paralympic Committee

| Category | Gender | Competition Type | The Competition |
|----------|--------|----------------------------|-----------------|
| SH1 | Men | 10 m air rifle standing | R1 |
| SH1 | Women | 10 m air rifle standing | R2 |
| SH1 | Mixed | 10 m air rifle prone | R3 |
| SH2 | Mixed | 10 m air rifle standing | R4 |
| SH2 | Mixed | 10 m air rifle prone | R5 |
| SH1 | Mixed | 50 m rifle prone | R6 |
| SH1 | Men | 50 m rifle three positions | R7 |
| SH1 | Women | 50 m rifle three positions | R8 |
| SH2 | Mixed | 50 m rifle prone | R9 |
| SH1 | Mixed | Falling targets rifle | FTR1 |
| SH2 | Mixed | Falling targets rifle | FTR2 |
| SH1 | Men | 10 m air pistol | P1 |

| | | | |
|-----|-------|------------------------|-----|
| SH1 | Women | 10 m air pistol | P2 |
| SH1 | Mixed | 25 m pistol | P3 |
| SH1 | Mixed | 50 m pistol | P4 |
| SH1 | Mixed | 10 m pistol | P5 |
| SH1 | Mixed | Falling targets pistol | FTP |

The Competition Programs

Competition Programs Known to the International Paralympic Committee

| | |
|-------------------|-----------------------------------|
| R1:R9-P1: P5 (FT) | Program (1) all competitions |
| R1:R5-P2:P5 (FT) | Program (2) air gun competitions |
| R6:R9-P3: P4 (FT) | Program (1) firearms competitions |

- The competition written between parentheses is optional.

Competitions and Levels

The Competition Levels Known to the International Paralympic Committee:

| | |
|---|-----------|
| International Paralympic Competition * | Level III |
| Paralympic Games, World Championships, Regional Tournaments of the International Paralympic Committee | |
| The Paralympic Committee and the Qualified Tournaments by the Local Paralympic Committee or the International Paralympic Committee for shooting | Level II |
| | Level III |

The Course of the Competition

The competitions of level III are held every four years as follows:

| | |
|--|-------------|
| Regional Tournaments except the listed in the Regional Games | First Year |
| World Championships | Second Year |
| Regional Tournaments except the listed in the Regional Games | Third Year |
| The Paralympic Games | Four Year |

The Annual Program of the World Cup Championships (Level 2 Competition) will be approved by the International Paralympic Committee for Shooting

The priority of acceptance will be determined for the program (1) competitions

If it is not possible to hold four competitions of the World Cup in the first program, the International Paralympic Committee may hold or organize two World Cup championships of the Program (2 or 3) in the same year instead of one World Cup championship in the program (1).

The Authorized Competitions

- The Local Organizing Committee is responsible for organizing competitions and it must be authorized by the Local Paralympic Committee and must have a structure approved by the International Paralympic Committee.
- The Local Paralympic Committee in conjunction with the International Paralympic Committee is responsible for the complete organizing of the tournament, its program, and ranking of the players as well as arranging all pre-screening devices before and during the competition.
- Procedures for hosting first and second level competitions.
- The first and second level competitions program can be applied by the first, second, or third program.

Participating in Competitions

- Participation procedures
- Participation Fees
- Basic Participation Fee: The Local Paralympic Committee with the approval of the International Paralympic Committee determines the basic Participation fee for all players of all games, executives, and participants of level 1 and 2 competitions. This fee is calculated according to the approximate value of the service's introduction to the individual during the competition (transportations, meals, etc.)
- Participation fees for each competition shall be determined by the International Paralympic Shooting Committee as well as the player and team participation fee for the 2nd level competition. It shall be collected as follows:
 - * Individual competitions: 5 Euros per player for each competition.
 - * Team competitions: 15 Euros per team for each competition
- The basic participation fees, as well as the participation fees for competitions, shall be collected by the Local Olympic Committee not later than the deadline for participation indicated by the instructions of the competition.
- The Local Paralympic Committee shall be required to supply the participation fees to the International Parliaments Paralympic not later than 30 days after the competition.

The Participations

- The lists of participation from the local Paralympic Committees of the participating



States shall be sent before the end of the deadline mentioned in the competition's instructions. Participation shall be closed by midnight from the specified and declared date.

- For World Cup championships, world championships, and regional championships; the Paralympic committees of the participating countries shall register their participations on the website by the end of the specified date as well as the total number of players, executives, and team competitions in which the country will participate.
- For World Cup championships, world championships, and regional championships; participations will be canceled for the following cases:
 - a. The maximum number of full competition participants allowed for each country in each competition is 4 players. (full competition participants mean that the shooter is allowed to reach the finals and achieve a score in order to have a rank)
 - b. Every country is allowed an unlimited number of participants (MQS), which means that all players are to achieve the qualifying score without competing on medals or ranks in the competition. If the shooting points are limited the participants' number shall be limited too.
 - c. When a country registers more than 4 players on the website, the country shall contact the International Paralympic Committee to assure who will participate in the full competition and who will by (MQS).

Late Participation or Replacing Players

- Late participation will be accepted according to the judgment of the Local Paralympic Committee and the International Paralympic Shooting Committee. The late participation fee is € 500 for each player in late registers.
- In case of any injury or condition that prevents the player from participating in the competition, the International Paralympic Committee and the Local Olympic Committee may agree to change the player accordingly to their judgment of the situation. The local Paralympic Committee shall submit supporting documents for their position to the International Paralympic Committee.

The Player's law

- All participating players shall commit to the international policy of the International Paralympic Committee (see the book of the International Paralympic Committee, the second part in 1.3 sections – the ipc).
- All contestants shall obtain ID with a special number issued by the International Paralympic Committee in accordance with the personal identification policy of the International Paralympic Committee by the end of the registration date.
- In Level 3 competitions: All shooters shall have an international rating of the situation certified or reviewed in accordance with the rating procedures or requirements set forth in the rating guide of the International Paralympic Committee for Shooting.

The Minimum Qualified Number (MQS)

- All shooters must obtain the minimum qualifying score to compete in level III competitions. The minimum qualifying number will be determined by

the Parliaments Committee Shooting in all competitions and will be published in the qualifying documents for each competition.

- There is no minimum for the qualifying score of the first and second level competitions according to the International Paralympic Committee for Shooting.

Organizing the Competition

- The International Paralympic Committee for Shooting has the right to organize world championships and level II competitions. The use of the "world" and "the International Paralympic Committee for Shooting" is not allowed in any event or any competition without the consent of the International Paralympic Committee for Shooting.
- The Paralympic Committee shall determine the laws and regulations governing the establishment of all competitions of the International Paralympic Committee.
- The International Parliaments Committee shall be responsible for all matters relating to the competitions and shall not interfere in employing the referees or executives of the competition (and shall have the power to postpone some competitions and give instructions in accordance with the law to establish these competitions).
- The competitions: (P1-P5), (R1-R9), and (FTR1) (FTP) (FTR2).
- For the level III competitions, the criteria for participation ('MQS', the minimum qualifying score, the competitions list, etc.) shall be determined in qualifying documents of each competition the number of shooters for each country
- The competition shall be held for each weapon if its minimum number of participants is determined and will be on a certain date and will be stated in the starting lists of the competitions.

- The Paralympics Committee has the right to cancel any competition in advance if deemed inappropriate in relation to the preparation criteria, including preparing the participants before the deadline for the participations. The Paralympic or Olympic Committee will announce in time for the cancellation of the competition.
- If necessary, the International Paralympic Committee will agree with the Olympic Committee on the maximum number of participants per competition according to the available number of points and the schedule of the competition.

The International Rating

- An international rating shall be carried out prior to the commencement of the competitions in accordance with the regulating laws and rules of the International Paralympic Committee for Shooting.
- Prior to the start of the competitions, a schedule will be made for the shooters to present themselves for the rating process and the Paralympic committees of the countries will be informed of the date of rating by the Bureau of the International Paralympic Committee.

The Technical Conference

- Before the beginning of the competition, a technical conference shall be held with the representatives of the participating countries and the organizing committee which is managed by the technical delegate of the International Paralympic Committee or the Chairman of the referee's Committee.
- There must be a period of time not less than two hours between the end of the rating process and the beginning of the technical conference.

The Starting Numbers

- The starting numbers for all shooters must be issued to all of them and written to all competitions' lists and schedules.
- The starting numbers of the shooters shall be printed on the back numbers issued by the International Paralympic Committee for Shooting and distributed by the organizing Olympic Committee. The back numbers of the disabled people of the category (SH2) will be issued marked by the letter (L).
- The back numbers' plates shall be designed according to the instructions given in Appendix (4).
- The back numbers' plates shall be always visible when the shooter or the disabled shooter is in the FOP.
- For wheelchair users using back seats, the back numbers' plates should be placed on the back of the chair.
- In the case that the back-number plate is visible to the shooter or for the disabled shooter, but not visible for the referee, he can prevent the shooter from completing the competition.

Technical Objections and Appeals

- Violations of laws will be dealt with as handled by the International Shooting Sport Federation and the International Paralympic Committee for Shooting.
- All objections in addition to the appeals on technical matters shall be dealt with by the International Shooting Federation laws using the official documents of the International Paralympic Committee for shooting which is available on its website.

- If the objection is not accepted, the objection's fees will not be refunded and will be in favor of the International Paralympic Committee for shooting.

Disqualifications

* Any player, team manager, team member, or any other individual: Violates the spirit of the fair play or offend any member of the committees, administrators, or arbitration commissions during the performance of their official duties or behave in a manner that is offensive to the International Paralympic Committee for shooting or any Paralympic Committee or any union in the competition may be punished in accordance with the laws and regulations of the International Shooting Federation and the Paralympic Committee International for shooting.

- * The situations that are not mentioned in the book of the law will be checked under the rule (case-by-case) by the technical delegate of the International Paralympic Committee for shooting at the earliest opportunity. Based on the situation check, a report will be written about the results and the procedure in the International Paralympic Committee office. In case the technical delegate is not available during the competition, the Chairman of the arbitration committee will cooperate with the Head of the rating committee, and with his attendance, to do the work of the technical delegate, consulting with the International Paralympic Committee and the local Olympic Committee if possible.

The Instructions of the Trainers

- * The trainers are allowed to approach the shooting line when requested by the shooter if he is allowed by the referee.

Target Changers

- * The presence of the target changers is allowed when requested. This depends on the field nature (e.g. paper targets) and the decision of the

Chairman of the Referees Committee and the Chairman of the Field Committee.

- * The target changer shall not be allowed to speak or give any signal during the competition to the player but only change his goals.
- * The target changer shall be behind the player at a distance not less than 1 meter during the shooting process. An exception can be made in accordance with the decision of the referee committee.

Results

- The results are calculated for all the Paralympic Committee's competitions as described in the ISSF Instruction Manual.
- If there is no system for calculating the official results of the competition, the Olympic Committee will be responsible for sending the results to the International Paralympic Committee no more than 7 days after the end of the competition and the official electronic results manual of the International Paralympic Shooting shall be used.
- The results manual should be organized by the technical delegate, the Referees' Rating Committee, the Office of the International Paralympic Committee, and the Local Olympic Committee.
- The official forms of the Paralympic Shooting Committee shall be used.
- The International Paralympic Committee have to publish the results manual within one day after the end of the competition.

Ranking

- The International Paralympic Committee for Shooting can maintain the global and regional rankings based on the final results lists adopted in the competitions known to the International Paralympic Committee.

- The ranking system will determine the best shooter for each competition each season using the points system.
- The shooters who hold a license and the reviewed rating status and have met the criteria to obtain a rating in the competition will receive the declared results for the purposes of the ranking.
- Ranking points will be calculated according to the level of the competition and according to the following table.
- The results to be considered are the level III (the best rank the player ever obtained), level II, and level I.

| | | | Calculating the results | |
|--|--|---|-------------------------|----|
| Level 1 competitions (listed international competitions) | Level 2 competitions (world cup competitions) | Level 3 competitions (Paralympic games, world championships, and regional competitions) | The rank | |
| 15 | 30 | 50 | | 1 |
| 13 | 25 | 45 | | 2 |
| 11 | 22 | 41 | | 3 |
| 9 | 19 | 37 | | 4 |
| 7 | 17 | 34 | | 5 |
| 5 | 15 | 31 | | 6 |
| 4 | 13 | 28 | | 7 |
| 3 | 11 | 25 | | 8 |
| 2 | 9 | 21 | | 9 |
| 1 | 7 | 18 | | 10 |
| | 6 | 15 | | 11 |
| | 5 | 12 | | 12 |
| | 4 | 10 | | 1 |

| | | | |
|--|---|---|----|
| | 3 | 8 | 14 |
| | 2 | 6 | 15 |

World and Regional Records

- The International Paralympic Committee shall ratify the international and regional records that meet the following criteria:
 - * The record was obtained in one of the competitions of the International Paralympic Committee for the shooting whether level II or III.
 - * The shooting rating complies with the rules of the International Shooting Federation and the International Paralympic Committee.
 - * The competition is held under the anti-drugs rules of the International Paralympic Committee.
 - * The official form of the regional and international records of the International Paralympic Committee for shooting shall be filled and available on the website of the country and sent to the Office of the International Paralympic Committee for shooting.

The Appearance and Equipment

- Complying with the International Shooting Federation's clothing rules.
- All individuals in the field of play and protocol areas shall comply with the International Federation Code for the shooting of Article (6.7.6.3.19.6.2.2.19.6).
- The shooters shall also comply with rules and regulations of clothing of the International Paralympic Committee as described in the clause (2.2).



- In competitions where the rules and regulations of the International Shooting Federation and the International Paralympic Committee are applied, everyone shall comply with them.
- The special clothing rules of the International Paralympic Committee for Shooting include jackets, trousers, and shoes.
- For contestants using chairs (not including high chairs), the maximum length of the shooting jacket shall not touch the base of the chair from the back and the front and does contact with the shooter's pelvis.
- Shooters who use high chairs or standing position shall use a shooting jacket according to what has been explained in the International Shooting Federation Law.
- The contestants are not allowed to sit on shooting jackets during the game.
- The same jacket can be used for all shooting purposes and the shooter is allowed one jacket which checked for use for all rifle games in one competition. There is an exception for this rule for the shooters of the SH1 category in the following cases:
 - a. Shooting from a prone position or from a table.
 - b. Shooting from kneeling position on the shooting chair.
 - c. In air pressure prone competitions, shooters may not prone but can use a table and a chair for shooting. If the shooter is forced to use a table, he or she will need it to use a shooting chair.

Shooting Trousers

- Shooting trousers are not allowed except for SH1A shooters when shooting from a high chair or standing position.
- For the specifications of shooting trousers, please refer to the International Shooting Federation Law, clause 5.5.7

Shooting Shoes

- Shoes shall be worn for all persons within the field of shooting.
- The shooter is permitted to wear shoes (for the consistency of the legs) or any shoes prohibited within the clothing rules (e.g. sandals) if he suffers a medical condition. This exception will be reviewed and recorded by the International Federation and stated on the shooter's license and the rating card. This type of shoes will not be checked during tasks.

Equipment

- Shooters shall use the equipment that complies with the rules and laws of the International Federation for shooting and the International Paralympic Committee for Shooting. Any equipment including weapons, devices, tools complementary tools, and so forth and that may give an unfair opportunity to others or not authorized or prohibited by these rules shall not be used.
- All tools used must be supplied by the shooter himself.

Chapter 11

Physical Preparation

Introduction

The physical preparation period is essential for building muscles, its symmetry, and coordination. Good preparation, as well as developing these elements, is a key factor in improving the performance of the shooter and his efficiency since the goal of fitness exercises employed herein is to make positive physiological changes to improve the physical performance.



On that, it is clear that both physical preparation and fitness are fully connected. In other terms, fitness is the only way to achieve physical preparation, which is the indicator of the level of physical preparation of the shooter.

Objectives of the Physical Preparation of the Shooter

The training process, trainers, and training foundations seek to achieve two main objectives over the course of the training process:

- Maintaining the training level of the shooter.
- Raising the physical and physiological condition of the shooter.

These are the two primary objectives targeted by all workers of the training field; to achieve them, some detailed points are to be worked on:

- * Developing and improving general fitness.
- * Focusing on the desired physical preparation of the sport (i.e. the shooting sport).
- * Mastering and perfecting the technique of the event.
- * Improving and developing the planning process.
- * Developing the involuntariness qualities (perseverance, self-confidence, and courage).
- * Fully preparing for the sports team.
- * Avoiding injuries, i.e. working on the health status of the shooter.
- * Carrying out tests and regular check-ups.
- * Providing players with the necessary information (training system, nutrition, analyzing games, the player-coach relationship, the planning aspects).

Types of Physical Preparation

General Physical Preparation

This kind of preparation aims at gaining physical and sporting strength generally, as well as acquiring the basic skills of the physical movement. The following are the most important characteristics of general physical preparation:

1. The comprehension of the fitness elements throughout the general preparation.

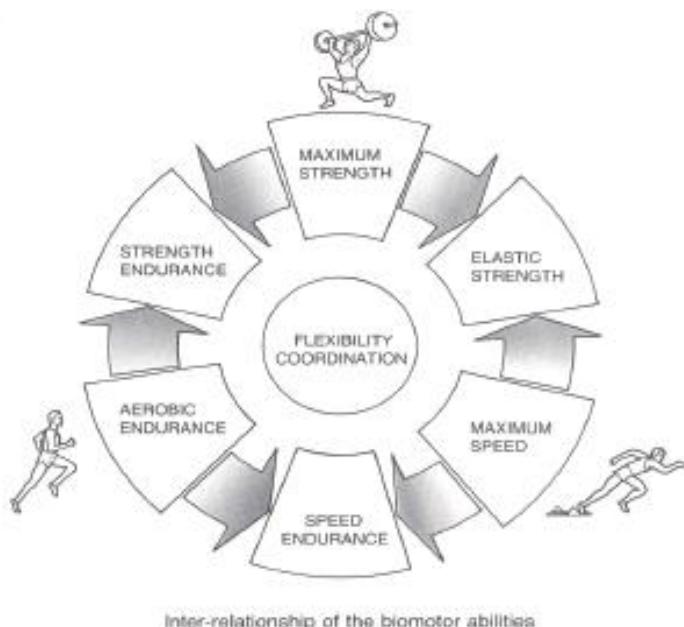


2. The exercises' components used in this preparation type vary according to the sport type.
3. The period of the general physical preparation process varies according to the sport type.
4. Escalating when developing the endurance.
5. Using unspecialized exercises.
6. Upgrading from general physical preparation to special physical preparation gradually.
7. Employing no breaks between the general and special physical preparation periods.
8. Using the continuous training method.

Special Physical Preparation

This kind of preparation aims at gaining the strength and skills of the shooting sport in order to level up and acquire the necessary physical requirements. The most important characteristics of this type:

- Considering the key elements of fitness necessary in shooting sport.
- Longer than the general physical preparation.
- Using loads higher than those used in the general preparation.
- Employing exercises according to the competition type.
- Using periodic and repetitive training methods.
- The training of this type grades from quantity to quality (i.e. the volume to the intensity).



Inter-relationship of the biomotor abilities.

The Physical Preparation Elements

1. Strength
2. Speed
3. Endurance
4. Flexibility
5. Balance
6. Agility
7. Coordination
8. Accuracy

The Fitness Elements of the Shooter

Flexibility & Stretching

A shooter needs appropriate flexibility to perform the correct anatomical positions of the shooting process easily—whether in muscles or joints. For example, in air rifle competitions, the shooter relies on the pelvic bones so that he must be properly flexible to lean his arm on his pelvis more easily in order to perform the anatomical shape of a correct shooting position. Factors affect the flexibility of the shooter:

- The age and training period.
- The shooting types.
- The type of joint and its structure.
- The coordination level of the involved muscles.
- The profession of the shooter outside the training process.
- The psychological state of the shooter

The Significance of Flexibility

- * Mastering and perfecting of the technical motion performance more easily.

- * Diminishing the energy and time of the performance as well as making less effort.
- * Delaying fatigue.
- * Developing the subconscious qualities of the shooter such as confidence.
- * Making injured joints regain their normal movement.
- * Contributing significantly to the performance of movements.
- * Mastering the technique of the shooting sport.



Examples of Developing Flexibility

1. Exercises for legs flexibility.
2. Exercises for back flexibility.
3. Exercises for arms flexibility.

Strength

It is the ability of the muscle to work against an external resistance (the weapon's weight) for a long time without fatigue. Increasing the endurance of the shooter is a key factor for keeping on performing and any problem in this factor affects the technical, psychological, and planning skills of the player greatly. Increasing endurance is to be accomplished via putting on more muscles and increasing its fibers, as every shot release damage some muscle fibers and the body begins to rest between shots. After the end of the activity, the body is to renew those damaged muscle fibers so they should be sufficient within the muscle to increase the endurance of the shooter and delay the fatigue and stress.



The Significance of the Muscular Strength in Shooting Sport

- * Muscular strength is a fitness component.
- * Muscular strength is used as a precaution against posture deviations and congenital defects.
- * It is also an essential element in the mobility of the shooter.
- * No physical activity can dispense with strength.
- * It is necessary for performing skills perfectly.
- * Muscular strength provides a base for shooters in all basic movements.
- * It controls the weapon appropriately.
- * It maintains the best performance of the shooter for a long period.



The Factors of Strength

- Physiological cross-sectional area.
- Muscles angles.
- The direction of the muscle fibers.
- Age, nutrition, and comfort.
- Genetic factors.
- The state of the muscle before the contraction.
- The muscle contraction period.



Examples of Increasing the Strength of the Shooter

1. Standing as long as possible.
2. Increasing the weights of the weapon in the training course.

The Coordination of the Shooter

In shooting sport, body coordination matters (visual, nervous, or muscular), starting from visual coordination (the eye and the view), and then the muscular coordination. Additionally, the nervous system is the link between the eye and the muscles (the index finger) through seeing the appropriate view (the shooting area) and stimulating the muscles. Then the eye sends nerve impulses to the brain for what has been seen, an appropriate chance of releasing the shot, and finally, the brain sends a nerve impulse to the muscles of two things:

1. Maintaining that appropriate view (the shooting area) and keeping the body stable.
2. Moving the finger to pull the trigger to release the shot.

The Significance of the Body Coordination in Shooting

1. It is of the physical and motor abilities.
2. It helps to master the technical performance and planning.
3. It helps the player to avoid expected errors.
4. It helps the player to do hard and fast performances of various degrees (in the finals).
5. It is essential, especially, in sports that require controlling the movement.

The Factors of Coordination

1. Thinking.
2. The ability to recognize the accuracy and sense of coordination.
3. Experience motor.
4. Physical ability development levels.



Coordination Development Methods

1. Beginning the training course with different positions.
2. Reversing the shooting process (using the other side of the body).
3. Restricting the speed and tune of the performance and changing the shooting distance.
4. Increasing the level of resistance within the performance (different temperature, high volume, different lighting, etc.), performing under abnormal conditions.
5. Doing exercises such as (rope jumping).

Agility

The ability to change the status of the body is often called agility; target sprint and shotgun shooters rely on this ability greatly. As the shotgun shooter performs the shooting process, and move appropriately, effectively, and quickly in conjunction with the target, he definitely needs to develop his agility. In addition, as the target sprint player runs and faces sharp curves, he undoubtedly depends on his agility to change the direction and position accordingly. While the body stops to perform the shooting process and then run again, that takes time concerning the agility and speed of the shooter in changing his direction. Agility provides the following:



- * The ability to make physical reactions.
- * The ability to direct the body.
- * The ability to keep balance.
- * The ability to coordinate between the different body systems.

- * The ability to prepare for movement.
- * Mobility.

The Significance of Agility in Shooting

1. Agility is a key component in general sports activities.
2. Agility contributes significantly to the process of acquiring and mastering motor skills.
3. The more agility the shooter has, the better the performance he achieves.
4. Agility includes a mixture of important factors for any sports activity, such as motor response.



Agility Development Methods

1. Teaching some new motor skills to increase the player's agility in all relevant skills.
2. Creating an unusual position to perform an exercise, such as training on the sand.
3. Changing speed and timing of movements.

Exercises for Agility

1. (Standing) plank jumps.
2. (Standing) zigzag running.
3. (Standing) running and changing direction.

Balance

It is the base upon which every position is built, as every muscle group is responsible for balancing a specific area. For example, the front and back muscles of the legs, the abs, and



the back muscles balance the center of the body. So, if a problem occurred (weakness) in a muscle group, the shooter loses the ability of balance during the shooting process and may get injured or distorted.

Factors of Balance

1. Genetics.
2. Muscular strength.
3. Mental capacities.
4. Kinetic-sensation realization.
5. The center of gravity and the balancing base.

The Significance of the Balance

Balance is a general ability that is pivotal in public life and in the sports field, so a number of important points must be clarified:

1. It is an important element in many sports activities.
2. It is a key factor in the stability of the shooter.
3. It affects the levels of stability.
4. It enables the shooter to deal with the reaction of the weapon.

Exercises for Balance

- Performing on one foot.
- Using airbags during the shooting process.
- Exercising blindfolded.

Cardiorespiratory Endurance

Shooting Sport is a combination of aerobic and anaerobic activities. During the release of the shot, the breathing process is stopped and the shooter depends fully on taken oxygen.

Consequently, the bigger the lungs, the more oxygen it could take in. However,



muscles take in oxygen during the performance process, making the shooter shoots comfortably without any muscle spasm or lack of oxygen.

Factors of Cardiorespiratory Endurance

1. Sports training.
2. Drugs effect.
3. Climatic factors.
4. Muscular stress.
5. Nutrition.
6. Personal habits.
7. Psychological state.
8. The efficiency of the heart muscle.

The Significance of Cardiorespiratory Endurance

1. It is of the most important components required for practicing most of those sports of long periods.
2. It is associated with many other physical components.
3. Cardiorespiratory endurance is linked to the interrelationship of psychological traits, particularly the determination of the shooter.
4. It is the first component of fitness.
5. It has a major impact on the time of stability.
6. It affects muscle control and the ability of relaxation.

Exercises for Cardiorespiratory Endurance

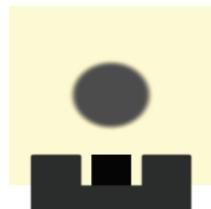
1. (Standing) run for 400–800 m.
2. (Standing) running for 12 minutes.
3. (Standing) repetitive running.

Accuracy

Accuracy is a fitness-motor component, as many scientists confirmed including Larsson and Yukkm as they said, "it is the individual's ability to control his voluntary movements towards a particular target." It also means efficiency in hitting the target, which indicates that all skills and plans to hit the target succeeded.

Types of Accuracy

- Spatial accuracy: Type of accuracy requires movements aimed at the location of an end-point.
- Accuracy Temporal: Type of accuracy requires motor speed according to the accuracy in motion time.
- Timing accuracy: Type of accuracy requires motor speed according to the accuracy in movement timing.



Factors of Accuracy

1. Taking the physical specifications of the shooter into account, according to the shooting sport type.
2. The safety of the nervous and muscular systems and the five senses, especially vision and hearing.
3. Paying attention to the psychological and emotional side of the shooter.
4. The continuity of the training so that it has no long periods of relaxation.
5. Keeping on training according to the nature of the competition.

Accuracy Development Methods

The development of motor accuracy is linked to the development of other elements of fitness as well as the following:

1. Using certain devices and tools to reach the required accuracy.

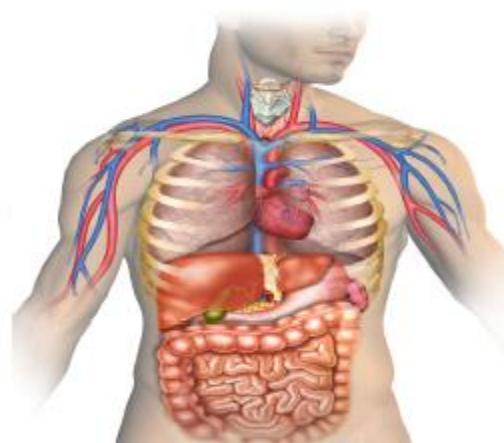
2. Using devices and tools of various sizes and weights to adjust the required movement.
3. Performing movements at different speeds.
4. Recognizing movements and connecting them.
5. Training on exercises similar to the performance of events in the various competitions.
6. Adjusting the new motor skills.
7. Practicing motor accuracy exercises at the beginning of the training course.
8. Stopping the accuracy training during cases of fatigue and exhaustion, especially those characterized by excessive training load.
9. Preferably, start the accuracy training at early age due to the flexibility of physiological systems.

Chapter 12

Physiology

Introduction:

Physiology is one of the important branches of biology that studies the biological phenomenon of the living organisms generally. An organism is a biological unit (i.e. structural, integrated, and interconnected unit which components interact to produce the phenomenon of life).



Physiology Science

It is the science studying how the biological functions of organisms happen, such as the circulatory system, respiratory system, and the muscular system.

This means:

- Describing the organs of the living organisms.
- Explaining and interpreting these functions in view of the physical and chemical laws.

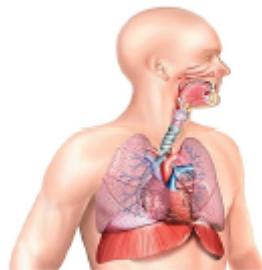
This is done by identifying the components of these functions. Physiology is associated with morphology sciences including anatomy, cell biology, histology, etc. Physiological studies are based on observing and experimenting natural

phenomena in order to describe and determine it. These studies aim to answer the following questions:

1. What are functions?
2. What are the factors influencing a function?
3. How this function performs?
4. How these functions integrate with other subjects?
 - Pumping blood to all parts of the body and providing the body cells and tissues of oxygen.
 - Receiving blood from all parts of the body during the period of the heart muscle relaxation, followed by contraction.
 - Factors affecting functions are what features an individual (age, gender, life, and sports conditions).
 - The heart is linked to most of the vital processes in the body such as the movement of blood from the vessels to all parts of the body and to provide oxygen.

The Significance of Physiology in Sports Training

It is one of the main topics of training through which we discovered the physical training methods' influences on the vital systems of the athlete's body so that we can determine the training load that is suitable for the individual. Training for one time or performing any physical activity causes responses in the functional systems because of this activity—this is related to the first point. The mentioned responses are temporary sudden changes occur in the functions of the body due to physical effort, although it all disappears afterward (i.e. high blood pressure, increased heart, and breathing rate). On the contrary, when practicing for a long time, adaptation processes occur in these systems.



The Significance of Physiology Science

1. Selection.
2. Determining the training load.
3. Identifying the physiological effects.
4. Tests and measures.
5. Recognizing the health status of the shooter.

The Physiology of the Heart and Respiratory System

Structure & Components of the Circulatory System

It consists of the heart and a network of blood vessels beginning from the aorta, the largest one, to a wide range of vessels that is less in width to the blood capillaries. However, the most important function of the periodic system occurs in those capillaries, which are exchanging gases and nutrients necessary for the tissues. As tissues get what is needed of oxygen, nutrients, vitamins, minerals, and water, it disposes of the metabolism productions and the blood turns from arterial blood to venous blood, heading back through the veins to the right side of the heart—namely ‘the systemic circulation’. Finally, the blood is pumped from the ventricle to the lungs where it is oxidized and converted into arterial blood again; then pumped back to the left side of the heart (left atrium to the right ventricle) where it pumped again to the body via the systemic circulation.



Pulmonary circulation/micro-circulation: The circulation between the right ventricle to the lungs and then to the left atrium. Based on that description, the heart works as a pump that transfers blood to all cells through the circulatory system.

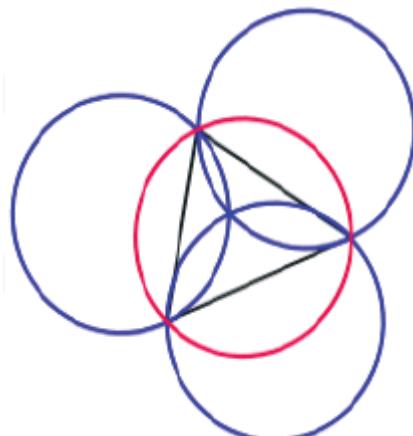
The General functions of the Heart and Blood Circulation

All functions depend on the presence of the blood inside the heart and circulatory system:

1. **Nutritional function:** Through the circulatory system, the food is distributed from the digestive system to all body cells of the shooter to get the different nutrients.
2. **The function of the respiratory system in the body:** The circulatory system supplies the body's cells of its needs of oxygen and absorbs the carbon dioxide. 
3. **The excretion function:** The circulatory system absorbs the metabolism productions from the different cells of the body and direct them to the excretion organs (kidneys for discharging urine, the skin for discharging sweat, and the lungs for breathing out carbon dioxide).
4. **Transferring hormones:** The circulatory system transfers hormones excreted by endocrine to its premises.
5. **Regulating the body temperature:** Heat lost is 20% of the overall body heat, as the heart pumps most of the blood to the skin in order to get rid of excessive body heat in the case of high body temperature—via extending the blood vessels of the skin. On the contrary, a large amount of blood is pulled from the skin in case of low temperatures via contracting the blood vessels of the skin.
6. **Maintaining internal stability:** This is by replacing missing nutrients and removing the superfluous subjects.

Feedback:

This process plays an essential role in the function of the body systems, as it solves any dysfunction of



body organs, forcing it to its normal rate, via providing feedback to the controlling centers of these functions.

Cardiac Output

It is the amount of blood pumped out of each ventricle per minute with each heartbeat.

A heartbeat per minute: The amount of blood pumped out of each ventricle per minute × Repetition

Cardiac Output Rate

In adult human = 70 cm³ with each pulse

Per minute = 5 l/min = heartbeat × heartbeat rate

$$\text{Cardiac output rate} = \frac{\text{Cardiac output per}}{\text{Human body size}} = \frac{5 \text{ L / min}}{1.7} \approx 3.13 \text{ l/m}^2 \text{ per minute}$$

Factors of Cardiac Output

Cardiac output ranges between 4.5–3.5 l/min.

1. Venous return rate.
2. The efficiency of the heart muscle as a pump.

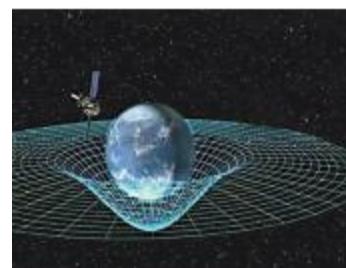
Firstly: Factors of Venous Return

1. The natural rate of the blood pressure of the circulatory system: About 100 in the aorta, 90 in medium arteries, 85 in small arteries, 35 in the arterial side of the bristles, 15 in the venous side, zero in the veins, and -2/-3 within the thoracic cavity and the right atrium.
 - Minus: The degree is less than the degree of the atmospheric pressure.
 - Zero: The degree of atmospheric pressure.

2. The breathing center during inhalation: The venous return increases and in exhalation decreases
3. Skeletal muscles contraction and muscular tone: It helps in venous returning, as in the contraction of blood vessels; it is squeezed to pump the blood towards the heart, increasing the venous return rate. Skeletal muscles are sometimes called peripheral pumps (because the heart is the central pump).
4. Arteries widening rate: Scientists found that venous return as arteries widen.
5. Capillaries tone: About 20% of the capillaries are open, while 80% are closed. This percentage is almost constant, but the capillaries shift positions with each other and its tone changes from one organ to another. Blood amount may increase or decrease depending on the degree of activity. In case of severe widening, not suitable to the blood amount, the blood pressure decreases as well as venous return rate—and the cardiac output as a result.
6. Gravity: It runs against the venous return, from the bottom of the body, while it helps from the top of the heart to the bottom.
7. The contraction of body blood stores: Some organs retain a portion of the blood, such as the spleen. When blood vessels constrict in these organs, the blood size increases, as well as the venous return rate.

Second: Factors of Heart Muscle Efficiency as a Pump

1. Venous return rate: The more venous return rate gets; the more muscle contraction strength gets within the physiological limits (Stirling law). For example, when rising a weapon and get off from the top or side of the aiming point, the shooter



takes a certain position (extend muscles) and then return to the shooting area. This is a result of an increase in the primary muscle length as there is a positive correlation between the primary muscle length and the length of the contraction. This also applies to the heart muscle due to being a muscle in the human body.

2. Heart muscle size: The greater the size the stronger contraction and vice versa, which increases the cardiac output for athletes.
3. Sympathetic nervous system: Scientists found that it increases the heartbeat rate and increases the strength and the rate of heart contraction.

Heartbeat

the heart works as a pump at a rate of 80:70 beats/min, but this rate reacts and changes in conjunction with the physiological changes of the body:



The change in the heartbeat rate is very important because it is one of the key determinants of cardiac output (for the performance of the athlete).

How to regulate the heartbeat rate:

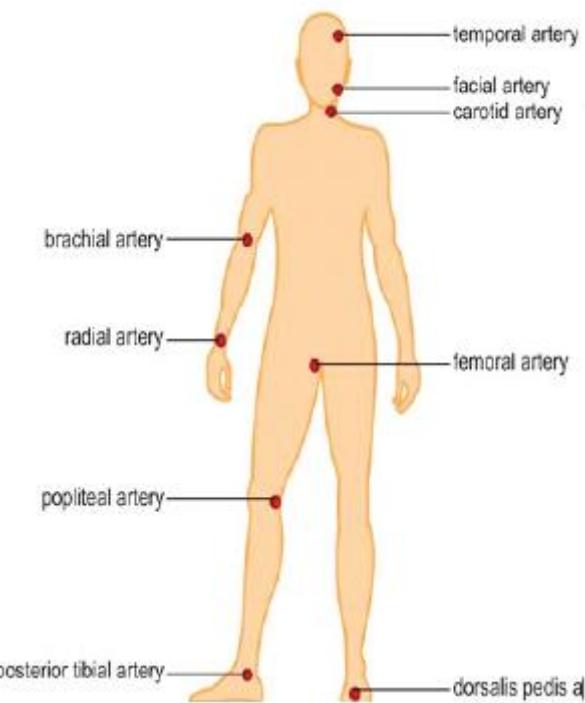
- * The physiological differences control the pulse of the heart.
 - * Increasing the activity of the vagal is the main influential of the heartbeat.
1. Age: An example is a fetus in the womb whose pulse is up to 140 beats/min.
 - * The newborn's pulse is up to 120 beats/min.
 - * The first-year child's pulse is up to 90–100 beats/min, and then gradually reaches 70 pulses/minute. Afterward, the heartbeat rate reaches the natural limit at the twenties and increases again during the aging stage.
 2. Gender: the heartbeat rate of females is slightly higher than males.



3. Lifestyle: It refers to the state of being athlete or non-athlete because the heartbeat rate of the athletes declines, especially when undergoing a special training program, to 40 beats/min while non-athletes' pulse is of a higher rate.
4. Sleep: The pulse rate declines at sleeping.
5. Psychological state: The Heartbeat rate increases due to psychological pressure and stress.
6. Pregnancy: The heartbeat rate increases during pregnancy due to physiological changes.
7. Body size: There is an inverse relationship between the heartbeat rate and body size.
8. Daily changes: Pulse decreases in the morning and increases in the afternoon.

Areas of Measuring the Pulse

- 1) Temporal artery
- 2) Carotid artery
- 3) Brachial artery
- 4) Radial artery
- 5) Femoral artery



- 6) Popliteal artery
- 7) Posterior tibial artery
- 8) Dorsal artery of foot

How to Control the Heartbeat rate during Shooting

There is an area in the brain (brain stem) responsible for regulating the heartbeat rate according to the physiological status (functional) of the person. This area subjects to many influences that control its activity and thus reduce heartbeat rate depending on the functional state of the body. The mentioned influences:



- * The circulatory system

In the circulatory system, some receptors record the changes and send them to the indicators of the heart to control its rate. These areas are the 'sensory areas' because it includes a number of receptors:

The blood pressure changing receptors and the chemical changes receptors of the circulatory system. These sensory areas are at the arc of the aorta and at the beginning of the internal carotid artery and send stimulants as follows:



I. Stimulants from the Arteria:

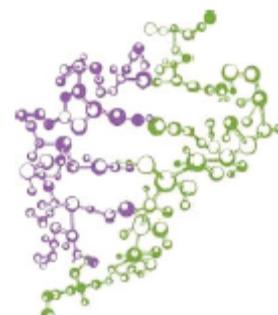
Scientists noted that when the blood pressure increases, these stimulants send signals to the centers, leading to a decrease in the heartbeat rate in order to restore the normal blood pressure. Likewise, when the blood pressure decreases due to bleeding or severe blood loss, these receptors send signals to the centers to increase the heartbeat rate, leading to a contraction in the blood vessels to retain the normal blood pressure. That is to afford a sufficient amount of blood to the various organs, especially, brain, heart, liver, the rest [small amount].

II. Stimulants from the Veins:

These stimulants are excreted from the right atrium and its major veins. When a large amount of venous blood returns to the right atrium and its major veins, the venous blood pressure increases, sending stimulants to the heart. That leads to an increase in the heartbeat rate in order to deal with the additional amount of blood.

III. Stimulants from the Skeletal Muscles:

It was found that when the skeletal muscles contract, it triggers stimulants to the heart to increase the heartbeat rate in order to meet the needs of these muscles, e.g. during the muscular contraction of the shooting position.



IV. Stimulants from any Painful Area:

When a part of the body hurts, it triggers stimulants to the heart demanding an increase in the heartbeat rate—except some parts, the so-called sensitive areas, of the body including the eyes, behind the ears, the throat, the genitals, above the stomach, etc.—e.g. when the heart is touched via watching an emotional scene. When the mentioned areas hurt, a neuromuscular activity is begun: The heartbeat rate declines, the vessels dilate, the blood pressure decreases, the breathing rate decreases and so forth.

V. The Influences of Other Senior Centers:

The cortex can affect most of the brain centers, including the heart, through its function as a senior center of conditioned actions. The hypothalamus is one of the senior centers responsible for organizing the volitional nervous system functions (sympathetic & nervous systems) and can increase the heartbeat rate when stimulating the sympathetic nervous system or reduce the heartbeat rate when stimulating the parasympathetic nervous system. The hypothalamus controls the reactions preceding emotions that are weak, average—accompanied by a

neurological sympathetic activity—or severe, be accompanied by neurological parasympathetic activity.

- * The Breathing Center:

There is an integrated relationship between the function of breathing and the heart's function.

Chemical changes:

The cardiovascular system and the brain include special receptors for chemical changes, which respond to the breathing gas pressure changes (carbon dioxide & oxygen) and the ph. It has been noticed that the heartbeat rate increases when the carbon dioxide increases, so as for the oxygen rate decrease or the hydrogen rate increase, either directly (a direct effect on the heart) or indirectly.

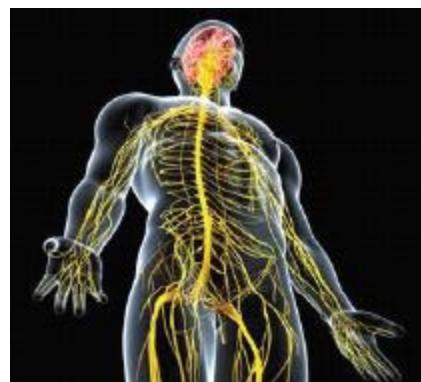
- * Natural Changes in the Body:

Scientists noticed a positive correlation between body temperature and the heartbeat rate—15 pulses/minute per degree.

The Nervous System of the Shooter

Anatomy:

The volitional nervous system encompasses some of the cerebral nerves including the third, seventh, ninth and tenth nerves (the vagus nerve). it also encompasses the spinal nerve, which comes from the sacral part of the spinal cord and is called (this cerebral and sacral part) the parasympathetic nervous system. The other part of the volitional nervous system is in both the thoracic part of the spinal cord and the abdominal one and is called the sympathetic nervous system (SNS).



The Foundations of the Volitional Nervous System Division

| | | |
|----------|--|---|
| | The parasympathetic nervous system (metabolic) | The sympathetic nervous system (catabolic) |
| Anatomy | Has cerebral and sacral output | Has thoracic and abdominal output |
| Function | Preserve energy and the metabolism | Prepares the body for abnormal conditions (critical) and emergencies. |

Distribution and Spread:

The sympathetic nervous system covers all organs and systems of the body and prepares the body for critical conditions and emergencies. Without the involuntary nervous system, a human or animal cannot survive these circumstances.

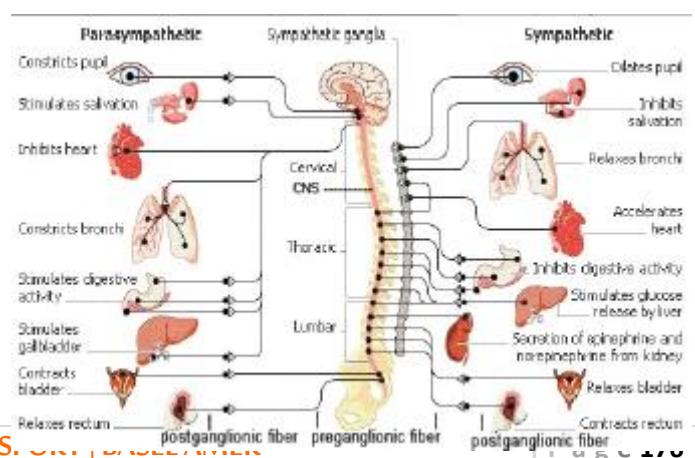


The Significance of the Sympathetic Nervous System

A man cannot survive any abnormal condition (danger, freezing, extremely hot, athletic performance, etc.) without the function of the sympathetic nervous system, as it prepares the body organs and systems to meet these conditions as follows:

1. Head and Neck

The body stimulates the dilation of the pupil and increases the space between the eyelids in order to widen the sight. In



addition, it excretes sweat to reduce body temperature after evaporation, of course. It also stimulates the thyroid gland to trigger more thyroxine hormone in order to increase metabolism due to the needs for energy. Finally, it increases the blood supply of the brain.

2. Heart

The body increases the heartbeat rate up to 70 cm^3 and 180–200 pulses/minute and makes the heart muscle contract harder. In each time, it pumps an amount larger than 70 cm^3 to $180\text{--}200 \text{ cm}^3$ and this would be reflected on the cardiac output, which will go up from 5 liters/minute to 35 liters/minute.

Coronary circulation: the coronary arteries are dilated so much to suit the functional status

3. Lungs

For the airways and the bronchus, fluids are secreted to facilitate the process of breathing during the shooting process (170 L/min for men and 120 L/min for women) and the blood vessels are contracted to pump the stored blood out for the rest of the body.

4. Abdomen

It converts glycogen to glucose during the shooting process, stimulates the adrenal gland marrow to secrete adrenaline and adrenaline, and leads to a constriction in the abdominal blood vessels to re-distribute the blood to the critical organs (heart, brain, and muscles).

The Inhibition of the Digestion and Absorption Processes

1. Pelvis

During the shooting process, the body postpones the excretion process, the secretion of sexual glands hormones, and the constriction of the blood vessels of the pelvic organs.

2. Extremities and Skin

The body stimulates the secretion of sweat to get rid of excess heat during the shooting process and constriction occurs in the blood vessels of the skin to re-distribute the blood to other organs.

3. Skeletal Muscles

A dilation occurs in the blood vessels to supply the necessary energy. In addition, the body delays the feeling of fatigue and increases the speed of healing.

The Muscular System of the Shooter

The muscles are one of the systems that help the body to carry out its functions through movement and interaction with the internal and external environments, seeking out food, escaping from an enemy, or walking in the land of God thinking in his creatures. However, the muscles are a dynamic system that identifies the relationship between the body and the environment—by the help of the nervous system, especially its volitional and physical part. Thus, humans always paid attention to the health of their muscles since the dawn of civilization. They also keen on increasing its strength to be able to overcome his fights, surviving and making living. In addition, the muscular contraction in the human being is responsible for speaking, eating, manufacturing, and performing the individual daily needs, etc. Not to mention the excitement of the sports that have become useful fun for which competitions and festivals are held around the world.

Muscle:

Muscles, like the rest of the various organs, are made of cells but special ones of a particular type, as they are long and thin. A large number of muscle cells gather to combine the muscle unit that is the muscle fiber. The strangest qualities of the muscle fibers are its ability of constriction and relaxation. The word muscle is derived from the Latin 'Musculus' which is the little mouse. This is because some



muscular movements remind us of the rapid movements of a mouse. Muscles make up 40–50% of the body weight. The body contains more than 600 muscles, namely the protective mass.

Muscle Types:

The human body contains various types of muscles:

1. The voluntary linear muscles (skeletal muscles)

The muscles that we can control and performs a particular function, you need or want, e.g. foot muscles, hand muscles, and hundreds of muscles along the body. The name 'linear' is due to its vertical and horizontal lines, while 'skeletal muscles' is attributable to that they are attached to the skeleton, which joints connect its parts. These muscles appear in the form of lines under the microscope, and of several types:

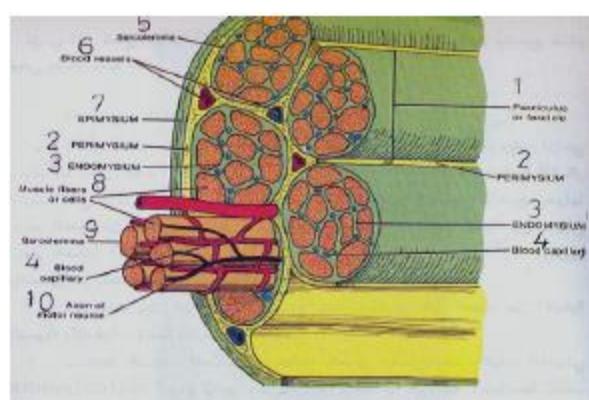
Circular (eyelid muscle), flat (temple muscles), wide membrane (the diaphragm), fusiform (the voluntary muscles).

2. The involuntary muscles (smooth muscles)

The muscles that cannot be controlled and do slow and involuntarily contractions. Smooth muscles are found in the internal organs such as the stomach, blood vessels, and urinary bladder. It is smooth (soft), non-linear, not attached to the skeleton, and do not subject to the will. The autonomic nervous system controls its functions (e.g. diaphragm muscle). Function: push substances through narrow passages. Advantages: Slow the movement and able to contract for a long time using a small amount of energy.

3. Heart muscle (cardiac muscles)

A distinctive muscle that has features similar to the voluntary muscles, but the autonomic nervous system cannot control its function voluntarily. It is a



muscle mass made up of special muscle tissues, covered by the stiff outer membrane of the heart, namely the pericardium, and the inner membrane of the heart, which is a thin layer of flat cells folds in some places to form the valves.

Muscles Structure

- * Firstly: Skeletal muscles

A muscle is a fibrous tissue features the ability to contract and relax, while a skeletal muscle consists of thin fibers in the form of bundles and each fiber consists of a number of cylindrical cells. The membrane of the fiber is called sarcolemma. The muscle fiber encompasses myofibrils through which a liquid called sarcoplasm. A myofibril consists of pieces of single, contiguous fibers called sarcomere, which are protein filaments—the thin actin and the thick myosin. Figure shows a diagram of the muscle structure: bundle [1], perimysium [2], epimysium [3], capillaries [4], endomysium [5], blood vessels [6], sarcoplasmic reticulum [7], muscle fibers [8], fascia [9], and axon of motor neuron [10].

- * Second: Smooth muscles

A muscle has no distinctive lines of the skeletal muscles, and consists of long thin cells tapered sides; each contains a nucleus surrounded by a small amount of cytoplasm. One may notice distinguish a number of long thin filaments in the cell—the myofibrils. As these filaments shorten, the muscle contracts and it consists of actin and myosin. However, the amount of protein and nutrients in it is less than of the skeletal muscles.

- * Third: Cardiac muscles

The muscles that are found in the heart's surface only and feature both the characteristics of skeletal muscles and smooth muscles (voluntary and involuntary). They are not long but is rectangular shaped and each fiber has a nucleus. Fibers merge with each other by side bridges and there is a clear intercalary disc between every two fibers.

- The figure shows: Cardiac linear muscle fibers

 1. Nuclei
 2. Discs.

The Muscle Mechanism of the Shooter

The muscle responds by a contraction or relaxation through an electrical nerve impulse transmitted from the brain to the muscle cells in order to provide the appropriate muscular contraction for the shooter. Myosin filaments slide on actin filaments by energy. The muscle energy is derived from a chemical in the whole body, called adenosine triphosphate (ATP). Second, the nervous stimulant resolves it to a simpler chemical substance called adenosine diphosphate (ADP) + energy. This energy moves the myofibrils of the muscle, contracting the muscle fibers.

* Firstly: Muscular contraction

This process follows a well-known physiological theory, the sliding filament theory, which is carried out via cross-bridges attaches actin to myosin, as they are bumped prior to contraction. When the energy stored in muscles disengages, it moves those cross-bridges to the inside and slides the filaments to complete the process of muscle contraction.



* Second: Muscle relaxation

Muscular relaxation happens as the muscle fibers return to its place before constriction, i.e. the cross-bridges disengage and move to the outside. This process takes place after the motor nerve stops conveying nerve impulses to the muscle fibers. On that, the heat, chemical energy production that was the cause of the cross-bridges' intersection stops. Relaxation also



gives an opportunity for the muscle to get its needs of energy and it occurs for the shooter during the break between shots in which the lost muscle fibers during shooting are recovered.

Types of Muscular Contraction and Factors

All human volitional movements occur due to the use of muscular strength, while the latter in turn causes muscular contractions because of daily exercises. As known, the goal of training is to increase the strength of muscle and that is done only through the muscular contraction, regardless of its type. The muscle works because of the integration between the muscular system the nervous one to overcome resistance using muscular contractions, although it varies depending on the different forms of shooting sports (pistol, rifle, shotgun, and target sprint).

1. Isometric Contraction (rifle and pistol player)

It is energy exerted against a constant thing (e.g. pushing a wall or trying to raise an extra weight), because of the increased weight. Training using fixed exercises was at the beginning of the 1950s; this type of contraction was widely employed due to providing much strength to the shooter. Hunger and Mueller proved that using this training of muscular tension daily by two-thirds of the maximum value of the individual for 6 seconds for 10 weeks, we get an extra

5% force per week. This exercise works on fixing and directing the muscle groups to perform the anatomical position the shooter trained on. We cannot make use of these exercises unless we take the necessary time to practice, and not to be surprised when putting on more size to the working muscle. The shooter can feel the difference training through his sense of strength when performing.



It must be noted that the isometric contraction leads to stress in the nervous system and increase the speed of movement, causing a lack of muscle flexibility, and a reduction in neuromuscular coordination. However, if the training sessions are regulated properly between work and rest so that the muscle of the shooter rests completely during the workout, it can overcome all the problems and damages. There are views that reject the use of endurance training for shooters in relation to the muscular contraction because its defects as described as follows:

- 1) Inability to learn and master the motor coordination through constant contractions.
- 2) It affects the motor sensation and the ability to relax and flex the muscle.
- 3) In the case of permanent use, especially when training one side only (i.e. the neglect of balanced training), it will have a negative impact on the shooter.

Some argue that we can avoid many problems by more stretching and relaxation exercises as well as proper training using a combination of isometric contractions associated with isotonic constrictions. Developing the isometric contraction that remains fixed along the muscle and only change the intensity of muscle depends on the internal expansion of the muscle without any closeness between the beginning side of the muscle and its end side.

2. Isotonic Contraction (the Target Sprint player)

This is the type of contraction in which the length of the muscle changes. It is a force exerted against a changing thing and it is shown in many different sports such as jumping and shooting. When lifting weights and the muscle lengthens, it is called a positive contraction. When the muscle shortens, it is called negative constriction. Therefore, we can say



that the positive isotonic muscular contraction is necessary particularly when performing, while the isotonic negative muscular contraction is less important when compared to the positive one. The isotonic constriction changes the length of the muscle fibers, which causes an increase in the muscular strength but less than the isometric muscular contraction—without the endurance and flexibility affected.

3. The Ericsson Contraction (shotgun player)

This type can be seen often during the shooting performance, as the muscles work under conditions close to the isometric contraction. For example, when the shotgun player moves holding his weapons towards the target (or when the target sprint player integrates running and shooting); the performance is both relaxing and contracting. This usually happens by doing some movements and exercises such as lifting weights off the ground until reaching the level of the arms or knees and then stopping; this means that muscular contractions have stages. When the muscular contractions happen while the muscle is stable, this called isometric one. On the contrary, if it happens and the muscle's length changes, this called isotonic one. On that, the Ericsson contraction is a combination of both contractions. All the muscular effort exerted here completely depends on the qualities of the athlete in terms of lean muscle mass, as the more resistance is (the weight of the weapon), the greater the load on the muscles involved. Nevertheless, the question is what is the relationship between these contractions? Undoubtedly, these contractions are interrelated and working on the development of any of them may be at the expense of others, but we believe that the shooter cannot abandon any of them. The isometric strength of the muscle

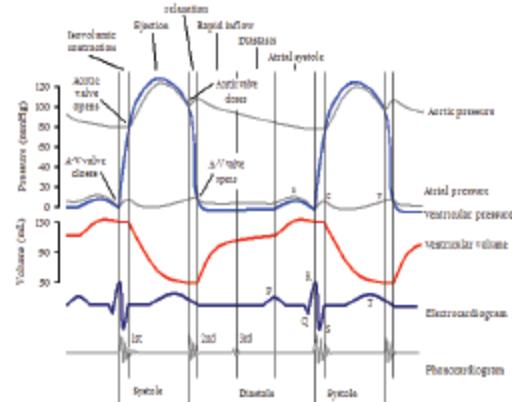


groups develops as the isometric strength evolves, but what should shooters and coaches focus on? This depends on the type of movement aimed, as the competition that requires great strength to have high speed will benefit the most from the isometric one. Actually, the matter requires a long tension that is employed in these contractions.

Factors of the Muscular Function

* The factors of the muscle:

- The mechanical differences that affect the muscular tensile strength such as the lever and the angle of the force, the position of the shooter's body, and the shape of his weapon.
- The ideal length of the muscle is that allows more myosin filaments to activate in order to generate enough energy to complete the contraction process. In addition to the relationship between the length of the muscle and the exerted effort, the maximum distance of muscular shortening is half the length of the rest time. This means that if the muscle lengthens before the work, its shortness will be longer by default.



* The factors of coordination:

It is linked to the central muscular system and its efficiency of managing; these factors can be divided into two groups:

- The mechanical factors of major muscles coordination between that perform the required movement and that corresponding muscles so that the work of each muscle group is done at the right time and by the required extension.

- The mechanical factors within the muscle that include the number of motor units involved at work.

- * The standby power:

It is difficult for the central nervous system to push the muscle to produce maximum voluntary strength; this means that the strength resulting from voluntary contraction is less than the real strength. The difference between the real strength and the voluntary strength is called the backup superpower. The psychological state of the shooter plays a major role in the output of standby power; this explains the improvement of the level of shooters during the general training and the private training—or in massage or localized heat by the devices meant for so.

- * Period of muscle contraction:

The length of the muscle contraction period reduces the strength of contraction, while the shortness increases the strength of muscle contraction, so if we are to achieve a less force, we have to get it out in less time possible.

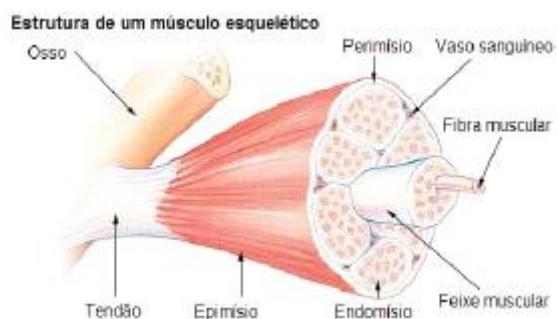
- * Muscle fiber type:

- Red muscle fibers red (slow) (endurance player)

It features less fatigue and is caused by provoked muscular contractions that are powerful and slow for long periods. The shooters select the proper practice during competitions require endurance dramatically—i.e. shotgun, rifle, or pistol player.

- White muscle fibers (fast) (speed player)

It features rapid constriction and fatigues quickly so that the shooter is characterized by aiming fast movement and transition, which is necessary to run in target sprint competitions.



- * Neuromuscular coordination:

The production of muscular strength depends on the status of the neural excitation of the central nervous system and the coordination of muscle groups in response to it. The more the coordination between muscles and nerves, the more muscular strength. The more muscle fiber size is, the more muscular strength is and vice-versa. Training focuses on increasing the muscle fiber size; this general increase is due to the increase in the components of each muscle fiber in terms of increasing actin and myosin filaments, the capillaries feeding the muscle, and the strength of the tendons.

- * Stimulating the muscle fibers:

The muscle fibers follow the role of all or nothing; if one fiber is stimulated, the muscle either fully contracts or not at all. This law applies to all of the muscle and its muscle fibers, as one nerve feeds a group of muscle fibers. Therefore, the expected strength of the muscle groups is associated with the degree and intensity of excitement.

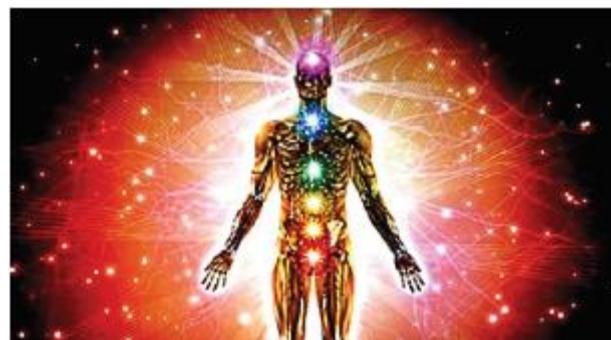
- * Preparing the muscle fibers:

The preparation meant is to give muscles the needed warm-up for warming the internal components of muscle fibers. The warm-up process is either natural by doing some general and special exercises or collective by stretches, massage, or heat therapy using specialized devices.

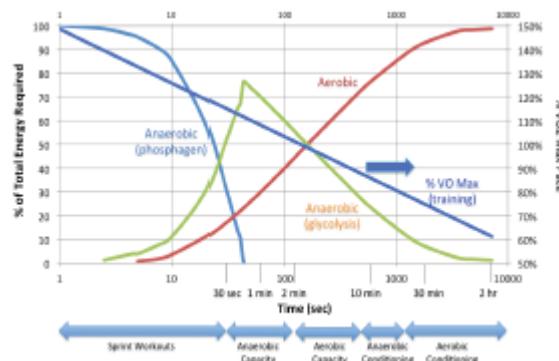
What is Energy?

Energy is defined as the ability to exert an effort, and there are several types of chemical, electrical, and mechanical energy. Energy can neither be created nor destroyed; rather, it can only be transformed or transferred from one form to another (i.e. becomes stored energy or kinetic energy), as the total energy of any system consisting of potential energy and kinetic energy. When the stored energy is released, it turns into kinetic energy. There are many forms of energy:

1. Electric energy
2. Mechanical energy
3. Chemical energy
4. Thermal energy
5. Light energy
6. Nuclear Energy



The main source of energy in the universe is the sun, as it gives light, thermal, and electromagnetic energy and other types and forms of energy. This energy spread into space during reaching the earth and the plants convert it into chemical energy stored in the form of carbohydrates, proteins, and fats with the help of chlorophyll, carbon dioxide, and organic materials and non-organic ones coming from soil and water. This is a complex method called photosynthesis. All creatures need the energy of the universe to keep on living.



Bioenergy is one of the important sciences to study for shooting sport. The vital energy of the human body is the source of movement, muscular contraction, and performance by all types. The muscular contraction that causes movement and fixes positions cannot occur without the production of energy. The energy used by muscle fibers are chemical so that it is stored in chemical molecules and can be transformed into kinetic energy within the muscle cell—these molecules used by muscle cells are adenosine triphosphate (ATP). The mentioned molecules contain three sets of phosphate and when one separates by a specific enzyme, it releases chemical energy estimated at 7.6 calorie/ mill (ATP). The myofibrils of the muscle fibers use this energy to cause muscle contraction and produce a certain strength.

ATPase



Other outputs of this molecule are adenosine diphosphate and one molecule of phosphate; the adenosine triphosphate enzyme helps in this partial decomposition located in the myofibrils of muscle fibers leading to the use of the released energy directly. It is useful to note that ATP macromolecules are only used for the production of muscle contraction or muscular strength; rather, used to supply energy to all vital operations of the living cell.

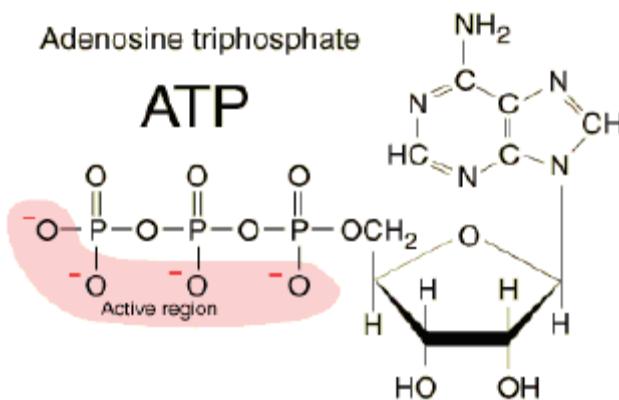


The human body needs the energy to carry out the following duties:

1. The mechanical contractions of the muscle fibers.
2. The internal organs doing its various functions (heart, stomach, intestines, lungs, etc.).
3. Providing body heat and maintaining a constant temperature.
4. Building, forming new materials, and compensating the damaged are used in the cell formation process.

Energy and Fitness

The energy of the human body is the source of movement, muscular contraction, and performance of all types. Muscle constriction that because movement cannot occur without the production of energy. The energy required for muscle contraction or athletic performance is similar, where the energy required for rapid contraction differs from that of long-period slow contraction. The body includes different energy systems for producing fast and slow energy power and cannot do any simple activity without the presence of energy. Therefore, one cannot acquire fitness that fits his activity without knowing the system produces it. Next, you must first identify the appropriate energy system and thus train to improve it in order to develop fitness. Each sport has its own requirements, which differ from the energy requirements of other sports. Moreover, energy is used differently in each sport, so the coach must fully learn how muscles use the available energy. Therefore, energy is defined as the ability to perform an effort. The biological activity includes movement of molecules through the cell membrane, the occurrence of the voltage difference in the muscle and nerve cell membrane, and metabolic processes including its construction and deconstruction process as well as micro-wicks movements of the fiber muscle to complete muscular contraction. Physical education science relies on learning how energy production occurs in humans. The significance of this reveals as the individual thinks of the biology of the body and its relationship with the type of movement and sports activity that can practice. For example, performing rapid exercises require a certain amount of energy within a short period. Energy is the



ability to carry a certain performance and is found in the body in the form of carbohydrates molecules, fats, and protein.

The benefits of bioenergy can be summarized as follows:

1. Classifying sports activities according to energy systems.
2. Designing various training programs according to the development of efficient energy systems at different levels.
3. Designing recovery programs during training in several different ways.
4. Organizing the diet of the athlete before, during, after training to ensure the continuity of energy supply as well as the speed of compensation.
5. Adjusting the weight of the body via nutrition programs and choosing the exercises that achieve so.
6. Improving fatigue resistance during training and competition.

Compound (ATP):

When this compound splits (the primary key for muscle contraction), it leads to the production of a large amount of energy, about 72 calories, a two-adenosine phosphate (ADP), as well as inorganic phosphate (Pi) as shown in the following equation:

$$\text{Energy (ATP)} = \text{ADP} + \text{Pi} + \text{Energy}$$

There are many sources explaining the division of energy production systems:

Resan Kharbat divided them based on the re-formation of ATP into three systems:

1. Re-formation of ATP by phosphocreatine.
2. Re-formation of ATP by glycolysis oxygen.
3. Re-formation of ATP through the aerobic process (decomposition of oxygen).

All three systems produce energy to restore the compound, which is the primary key for muscle contraction.

Systems and Energy Sources during Sports Activity

There are three energy systems, all supply ATP to the muscle and differ in how much the amount of the production of this enzyme and these systems:

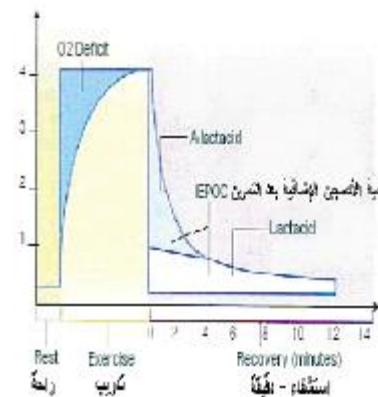
- * Anaerobic system (phosphate).
- * Lactic system (glycogen and lactic acid).
- * Aerobic system (oxygen).

1. Anaerobic System (phosphate)

This system is essential in the training of sports events that depend on anaerobic energy production. Thus, it is essential for speed training.

This system is based on adenosine triphosphate (ATP) and phosphocreatine (CP) without oxygen. The amount of ATP in the muscle of even well-trained athletes is not enough to keep the maximum muscle power more than three seconds, while there are plenty of sports activities depend on anaerobic endurance such as races, so it is necessary to generate new ATP continuously. Energy starts to release after all ATP stored in the muscle runs out by the phosphocreatine (CP), which is another chemical compound with a high-energy phosphate bond. Phosphocreatine can provide a sufficient amount of energy to produce ATP directly or combine the phosphate dissolved ions of CP with ADP or AMP. Needless to say, that the amount of CP is two to four times the amount of CP in the muscles. Most importantly, the muscle in which phosphocreatine is stored becomes prepared immediately to any muscular contraction and do so within a small fraction of a second. The combined amount of CP and ATP is called 'cells of phosphate energy system', which provides muscle capacity, and anaerobic endurance that extends to 10 seconds—almost enough to finish 100 meters race at full speed.

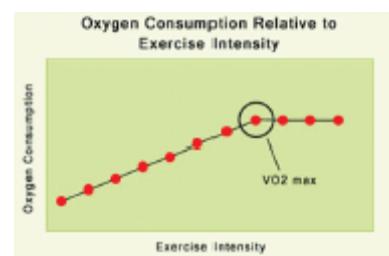
2. Lactic System (glycogen and lactic acid)



Many sporting events employ the lactic system for energy production; anaerobic exercises rely heavily on this system by developing anaerobic endurance and increasing the anaerobic ability of all body organs. The lactic acid system begins after the decomposition stage of ATP and lasts from 1.3 to 1.6 minutes and it can be used in all events that end within this time. Its mechanism starts by splitting the glycogen stored in the muscle in order to turn into glucose, which is used then for energy production. This process takes place without oxygen because when glycogen decomposes, each glucose molecule splits into two molecules of pyruvic acid, energy is released, and four molecules of ATP are generated from each original glucose molecule. When the amount of oxygen stored in the muscle cells runs out, the oxidization stage of the pyruvic acid starts; then it turns into lactic acid, which spreads outside the cellular fluid of the muscle cells to the blood. On that, most of the muscle's glycogen turns into lactic acid, which in turn leads to severe fatigue because of accumulation in body fluids. However, during this process, the large energy of ATP is produced without oxygen consumption. The production of ATP in this system is completed only after 1.6 minutes as a maximum in addition to the 10 seconds the phosphate system takes.

3. Aerobic System (oxygen)

The aerobic system depends on the external oxygen regarding its mechanism and it is used in sports events of long periods due to having enough time to deliver the oxygen inside the lungs to the working muscles through the blood.



This system is employed in sports events that lasts for almost two minutes or above and works on saving energy through oxidizing nutrients found in cells by the decomposition of glucose, fatty acids, amino acids and oxidizing it by the air within the body to release large amounts of energy. This energy is sufficient to

convert (AMP) and (ADP) to (ATP) continuously and for long periods according to the sporting event of long period, as it needs building and a different development unlike the other energy systems of other sporting events.

In general, all energy production systems are linked, as the energy produced from the glycogen system is used to re-compose (CP) and (ATP) and the energy generated from (CP) is used to re-compose (ATP). In addition, the energy of the aerobic system is used to reproduce the other systems, all of them. The lactic acid accumulated in body fluids due to stress will disappear in the recovery period due to the energy of the aerobic system. That is by either re-converting it to pyruvic acid and then restored in the tissues of the body or re-converting it to the liver in the form of glucose to be used later in supporting the glycogen of the muscles.

The aerobic energy production system produces much more energy than the anaerobic system, as each glucose molecule produces 38 ATP molecules. With oxygen, the muscle contraction can last endlessly before reaching the state of exhaustion, as lactic acid that caused muscle fatigue does not precipitate. Nevertheless, if the intensity of the exercise is too much that the heart is not able to secure the required oxygen in time, the body will shift to the anaerobic system.

The body stores fat far greater than glycogen and therefore very rarely it runs out of fat, but glycogen stores could completely deplete. That affects endurance activities in which you must provide small amounts of glycogen to burn fat and produce energy from them. Marathon runners deplete glycogen after a period of running and then the body is forced to use protein.

Muscles Energy Source

Muscles usually contain a small amount of ATP, which is the main source of muscle contraction, as a result, this amount is only enough for a few contractions.

There are other sources of energy, including:

- * Creatine Phosphate (CP): A quick source of energy for only seconds, and during rest its concentration becomes five times as much as the concentration of ATP.
- * Glycogen: Multiple enzymes decompose glycogen and it results in glucose that is oxidized and decomposed to provide 38 ATP molecules—in order to supply the muscle with energy for 50 minutes of exercise.

In the process of fermentation, the glycogen decomposes to give two ATP molecules only. The muscle employs the fermentation process when the contractions are consecutive, fast, and the amount of oxygen is insufficient to complete the glycogen decomposition process. As a result, the lactic acid accumulates in the muscle, causing a condition known as muscle fatigue, as the excess acidity resulting from the accumulation of lactic acid decreases the power generated by the cross-bridges of the muscle. A simple rest is enough for the muscle to constrict if alerted, as lactic acid is consumed to build glycogen and creatine phosphate again.

Muscle Spasm

The lack of ATP keeps the cross-bridges linked to one area of actin, leading to continued contraction—the muscle spasm.

Muscle Function

Bending the forearm is a double process in which the biceps constrict and the triceps relaxes at the same time. Extending the forearm is also a double process in which the triceps contracts and the biceps flexes. That is the secret of most body muscles, as they work in groups—the leg muscles, the finger muscles, or the six muscles that move the eyeball; there is no single muscle working alone. Regardless of the effort exerted by the muscle, another muscle does an opposite action. Rather, the simplest of movements requires the work of entire muscle group, and some might be even away from the place of the movement, e.g. when

you pull a rope, you find that leg, back muscles, and toes help the arms. When the muscle contracts, it shortens but gets thicker in the middle; that happens in the muscle fibers and thus appear in the entire muscle. Therefore, biceps get bigger when contracted.

Maximum Aerobic Capacity of Oxygen Consumption (VO₂ MAX):

The fitness of an activity is measured by the maximum amount of oxygen consumed when performing exercises.

The maximum aerobic capacity of oxygen consumption (VO₂ MAX) is the amount of oxygen in milliliter that the individual can use in 1 minute per kg of body weight. Players of high fitness have high values of VO₂ MAX and can practice intense exercises. Studies have shown that a player can raise the VO₂ MAX by working to 65%–85% of the maximum heartbeat rate. The average rate for male athletes is 3.5 milliliters/min, and female is 2.7 ml/min.

The body consumes at rest 22050 milliliters of oxygen per minute, and there is a certain oxygen consumption limit that cannot be exceeded by any human. That limit varies depending on the type of sports activity practiced by the individual as well as the "intensity of effort", which can be up to 5000 milliliters per minute or more, particularly champions.

Methods of Measuring the VO₂ MAX

1. Techniques that depend on the physiological response, including the use of Astrand-Rhyming, which focuses on the relationship between the rate during physical exertion and the amount of oxygen consumption so that the heartbeat rate up, during the effort, to 12070 beat/min.
2. Measuring VO₂ MAX by running.
3. The vital capacity test, which is an indicator of the following physiological processes:
 - i. The respiratory system efficiency in delivering air to the blood.

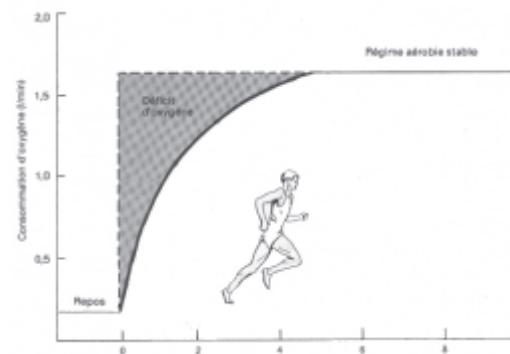
- ii. The efficient of oxygen uptake processes, which is associated with the blood volume, the number of red blood cells, the hemoglobin concentration, and the ability of blood vessels to convert blood flow from the tissues to the working muscles.
- iii. Muscle efficiency in consuming oxygen, i.e. the efficiency of metabolism and energy production.

Aerobic Capacity Levels:

The ability levels of aerobic capacity vary between the maximum limit and below; it is called the maximum capacity of aerobic. This indicates the maximum amount of aerobic energy that the individual can produce during one minute, although it is not the main basis for the performance of most sports activities, as many of those activities are performed at less than the maximum oxygen consumption—less than 80%. Therefore, it is called the anaerobic threshold. Nonetheless, we will explain the maximum oxygen consumption and the anaerobic threshold in some detail.

- * Firstly: The maximum oxygen consumption (VO₂ MAX)

Muscles cannot continue to work without oxygen (anaerobic) more than ten seconds, while the work may last for more than a minute in the case of continuous supply of oxygen by delivering it from the lungs to the working muscles. The greater the intensity of the training load, the more the speed of oxygen consumption. The largest volume of oxygen consumption during muscle work using more than 50% of the body's maximum oxygen consumption is the maximum aerobic capacity.



The aerobic endurance of a muscle is associated with its ability to keep on working as long as possible depending on aerobic energy production; this, of course, means increasing its efficiency of consuming oxygen. Nonetheless, in this part, we refer to the role of the muscle regarding this topic only, emphasizing that slow muscle fibers are responsible for long performances and the oxygen consumption within. Slow muscle fiber efficiency in aerobic metabolism is due to the following reasons:

1. The slow muscle fibers contain a large amount of myoglobin, 2 times more than fast fibers, which is the reason for its red color.
2. Increased mitochondria in the slow muscle fibers and increased enzymes that help in the aerobic metabolism and reduce the lactic acid accumulation, resulting from increased oxidation of pyruvic acid.
3. The slow fibers contain the largest number of capillaries surrounding each fiber, allowing oxygen to spread more quickly and the disposal of metabolism wastes.
4. The slow fibers contain more fat and enzymes that help in oxidizing the latter, reducing the dependence on muscle glycogen and maintaining its level.

It is known that the maximum oxygen consumption reflects the body's aerobic ability; three basic systems that are responsible for this: The respiratory system, circulatory system, and muscular system. Despite the significance of these systems' functions and cooperation, the most important of them is the muscular system, as it is the determining factor of the aerobic efficiency.

* Second: The anaerobic threshold

The anaerobic threshold is a physiological condition the player reaches during an athletic performance; it has special physiological specifications and is related to energy production and the efficiency of the body regarding these functions—

particularly the relationship between the composition and decomposition of lactic acid, the maximum oxygen consumption, as well as the pulmonary ventilation. A player can reach this condition when the speed of lactic acid composition is greater than the speed of disposal. The anaerobic threshold is the level of endurance in which the composition of lactic acid, transferring from the muscles to the blood, is more than the disposal rate.

Matthew Fox identifies this condition as the high intensity of training load or oxygen consumption while increasing the speed of anaerobic metabolism, while Lamb defines it as the peak point of pulmonary ventilation stop or the level of physical load in which the aerobic energy production increases via the lactic system because of its increased concentration in the blood.

The Anaerobic Threshold & VO₂ MAX

In fact, a player cannot perform his muscle work using the maximum oxygen consumption, by 100%, it is often at 90-95%. He also cannot keep on performing at this high level for more than 105 minutes, so the player does not depend on the maximum oxygen consumption when performing long physical activities. However, the anaerobic threshold is a factor that distinguishes endurance players in the case of equal maximum oxygen consumption. For example, if two swimmers are equal in the maximum oxygen consumption level (5 L/min each) and they swim with a speed requires the use of 85% of the maximum oxygen consumption, the swimmer who has a superior anaerobic threshold can maintain his level of speed for a longer time due to less lactic acid composition. Actually, the other swimmer who had a less anaerobic threshold level will develop more lactic acid, because he cannot get rid of it as needed—so he reaches the anaerobic threshold faster. From this standpoint, developing the anaerobic threshold is more important than the maximum oxygen consumption. This result was observed on a large number of players such as Derek Clayton, the marathon player, who has low

maximum oxygen consumption level but higher anaerobic threshold—more than 90% in compare to his rivals—so he runs at a high level of maximum oxygen consumption without an increase in the accumulation of lactic acid.

Based on the above, we can point out that the aerobic endurance does not depend only on maximum oxygen consumption, as it is not that of a superior factor, and the anaerobic threshold level is the decisive factor.

* Comparison between anaerobic and aerobic capacity

| | Aerobic capacity | Anaerobic capacity (lactic acid) | Aerobic capacity (APT-CP) |
|---|--|--|--|
| 1 | Aerobic (it depends on oxygen). | Anaerobic (does not depend on oxygen in releasing energy). | Anaerobic (does not depend on oxygen in releasing energy). |
| 2 | It works in light and medium intensity movements for a long time. | It works in high-intensity movements with a time ranging between (30 seconds and less than 2 or 3 sec.). | It works in short time high-intensity movements that range between 10–15 seconds). |
| 3 | Uses carbohydrates and fats for energy production and uses proteins when depleted. | Carbohydrates are the primary source of energy production. | Depends on ATP-CP stored in cells. |
| 4 | The released energy is very large. | Low energy produced. | Very few energies released. |
| 5 | To release energy, it needs a longer time than the rest (LA and | It needs a wide range of chemical reactions. | This indicator lasts for very little time. |

| | | | |
|---|----------------------|---|-------------------------|
| | ATP-CP). | | |
| 6 | Slow energy release. | Fast in releasing energy and leads to the accumulation of lactic acid in the blood. | Fast in energy release. |

Chapter13

Psychological Preparation

Psychological Preparation for Shooters

Introduction

Sport psychology discusses mental health besides physical health. An anxious or stressed athlete cannot achieve anything even if he trained or learned the concepts and theories of training. On that, it becomes clear that this science is important in recognizing these mental illnesses as well as getting rid of them as much as possible through the optimal use of mental health theories and personality traits development. The sport is, in general, a valuable opportunity to develop and modify some personal attributes of the athlete, such as cooperation, self-confidence, and obeying the laws.

Sport psychology increases the motivation level towards accomplishing better achievements by taking into account the needs and desires of athletes and reminding them of the important gains and fame of high achievement and sport level stability. Often, the player's level when training differs in the game! Here



comes the psychological preparation significance; an educational psychologist in the training program is to help the player get rid of the fear that affects him in front of the public, especially in crucial matches. It also contributes to determining tendencies.

The Character and its Concept

'Character' is a commonly used term in our daily lives for describing those aspects that make a person attractive or unattractive in others' point of views. Accordingly, we love individuals who are described as possessing strong characters or being nice and of good qualities. On the contrary, we do not like who of weak characters or permissive. The character, on this, is the dynamic regulation of the psychosomatic systems within the individual that determines his unique nature regarding behavior and thinking process.

- * The 'dynamic regulation' expression confirms the ever-changing nature of the individual.
- * 'Within the individual' expression refers to the internal concerns more than the appearances.
- * The 'psychosomatic systems' expression refers to the link between psychological and physical factors and dependency.
- * The word 'determine' means 'direct' and 'make' decisions about certain behavior and thinking suitable to different examples.
- * The word 'unique' indicates that every individual has distinguished and distinctive character and no two people have the same personality.
- * 'Behavior and thinking process' phrase means what the individual performs of internal and external activities, trying to adapt and coordination with the environment to take hold of it.

Personal Theories

There are many theories and models presented by scientists and philosophers in the field of 'character' and its applications for the athlete, including:

- Psychodynamic psychology.
- MBTI.
- Trait theory.
- Social learning theory.
- Transactional analysis theory.
- The interactive model theory between personal factors and situations:

This theory is based on the interaction between the character and the environment. In view of this, looking into personality in terms of personal characteristics only or its situation may lead to inaccurate results. Thus, we should link all personal factors, characteristics, and attitude effectively to reach accurate results for a better understanding of one's character and predicting his behavior.

To demonstrate this perception, especially in the field of sport psychology, a person may be aggressive in a particular situation but not as so in some public life situations. As is the case for anxiety, one may be anxious in an exam but not in kinetic response situations.

Cox's personal interaction and attitude model of the player's overall behavior was to evaluate the player in terms of personal factors and sporting attitude and its impact on sporting behavior. In fact, this behavior represents 5% of the player's attitude, while the remaining percentage is represented by the physical and motor skills development and the degree of difficulty of performance or task and the level of competition represents 5%.

Motivation

Motivation is among the most important topics that paid the attention of many scientists and researchers of general psychology and sports psychology, especially. Thus, they indicated, since the beginning of this century, the significance of studying motivation, as it is the main drive for all types of human behavior. In fact, a branch of psychology called motivation psychology or the science of motivation was linked to the emergence of many theories, models, and hypothesis that tried to define the concept of motivation, its conditions, how it appeared, its direct and indirect effects on human's behavior, and the ways of activating it in order to achieve goals in life. In view of that, sport psychology scientists, since the late fifties, have not ignored the attention paid to motivation. Therefore, many researchers perceived that motivation is the key to real sports practice on different levels and is the most important variable that drives and encourages the athlete to achieve international and global achievements.

The Concept of Motivation

Motivation has many terms, concepts, and conditions can be defined as follows:

The Motive

An internal state excitement that stirs and direct behavior. It is seen as a state or internal power that contributes to directing the behavior to achieve a particular goal.

The Need

A case of need and lack associated with a particular type of excitement that disappears when you eliminate the need and fulfill the lack. It may be physiological, such as the need to warmth, or psychological, such as the need for achievement.

The Instinct

An innate state occurs always or regularly in response to specific and complicated reactions among all members of the same gender when distinctive or certain types of insights.

The Drive

Some researchers use the term Drive instead of instinct, as the latter is only an innate instinct works to evoke certain types of behavior to achieve certain goals.

The Incentive

The incentive is different from the motive; while the motive is internal, the incentive is external. In fact, reward and punishment are types of incentives that can satisfy the driving conditions. It may also be material or moral and is associated with the external environment.

The Tendency

Sometimes called interest and it is the willingness of an individual that draws his attention to certain things and evoke his conscience to identify tendencies regarding sports activities; it requires the following:



- Verbal expression of love or hatred towards a particular activity.
- Practicing the activity that the athlete tends to spend time exercising.
- Having information on the chosen activity.

The tendency or interest in a sport does not always mean practicing because materializing the tendency requires another condition [the ability], as an individual may love basketball and tends to it, but not necessarily have the ability or kinetic skills required for this game.

The tendency towards a physical activity may be positive and reflected in practicing a particular type of sport and it may be receptive, i.e. the individual receives his tendency by reading or watching everything relevant to the activity.

The Attitude

It always has been seen as a particular type of motivation that modifies behavior. Many researchers intended many definitions to the 'attitude', e.g. the attitude is a tendency to respond in a particular way to a special or certain set of stimulants, the attitude is a default state of readiness to respond in a systemic way that supports or oppose a certain exciting situation.



Intrinsic and External Motivation in Shooting Sport

Motivation can be categorized into many different classifications; in the present time, many psychology researchers almost agree that in order to understand motivation, we shall classify it into intrinsic and external.

Intrinsic Motivation

The intrinsic motivation of sport meant here is that comes from within the shooter and is fulfilled by practice or athletic performance, such as satisfaction, pleasure, and excitement resulting from sports practice and the satisfaction of overcoming hard physical exercises or require more courage will. Alternatively, it comes from the aesthetic pleasure of coordinated performance, excitement, and challenge of some obstacles or difficulties of performance. On that, intrinsic motivation suggests that athletic performance is the value itself.



External Motivation

The external motivation of sport is not resulting from within the individual, but evokes and directs his behavior towards the athletic performance, e.g. trainers, administrators, parents, or friends are external motivation to the shooter. In addition, various means that stimulate the shooter to achieve are external motivation such as material or moral gains as getting a bonus, prizes, encouragement, or acquiring health and fitness.



The figure illustrates the relationship between external motivation and intrinsic one, as it has been shown that intrinsic motivation manifests during the performance and is reflected in the sense of self-fulfillment, joy, and satisfaction. On the other hand, it shows that the external reward motivation manifests after the performance in the form of excellence, praise, and multiple rewards.

In view of the above, intrinsic and external motivation are closely related, like two sides of the same coin, as all athletes practice to get both, but vary in terms of the effect on the shooter. Here comes the role of the coach, i.e. knowing which kind has the upper hand on the shooter. Moreover, we can increase the intrinsic motivation of a shooter via increasing the external one, which may be of use in inducing the shooter to practice the shooting sport or develop his performance for a certain period but does not guarantee the continual practice nor achievement. The point is that external motivation loses its influence faster than the intrinsic motivation, as rewards and prizes represent the experiences of brief success but the primary goal is to continue practicing in order to achieve pleasure and satisfaction, through the practice itself, which is achieved through the intrinsic motivation. As mentioned earlier, external motivation can boost external

motivation, e.g. when offering external motivation sources (reward, prizes, etc.) to improve performance regardless of the results (winning or losing).

Furthermore, when offering the mentioned external sources (reward, prizes, etc.), you earn the junior's tendency towards a particular practice, growing his self-reward motivation, taking into account that keeping on will dramatically reduce the significance on intrinsic motivation and vice-versa.

Some Theories explaining Motivation

- * Maslow's hierarchy of needs.
- * Instincts theory.
- * Stimulating theory
- * Social learning theory.

Maslow's Hierarchy of Needs

The hierarchy of needs theory presented by Abraham Maslow offers a cumulative chain of human need, ranked from the lowest to the highest (Maslow, 1970). He also pointed out that individuals fulfill their need according to a natural system of priorities of the body and mind—these priorities are two categories:



- * Deficiency needs

It includes the necessary needs or basic life needs, including consumption and energy recovery needs such as the need for food, water, and sleep and the need for security and safety that have a priority in human life.

- * Growth needs

It includes the psychological and social needs such as love, belonging, friendship, self-esteem, and self-fulfillment as shown in Figure:

From Maslow's perspective, Deficiency needs should be satisfied first before growth needs, as the need for food and water is more urgent than the need for love, friendship, and appreciation. Surprisingly, when fulfilling the shortage needs, they are no longer needs but become something greater. On the other hand, needs should not be allowed to express themselves nor be fulfilled before the most important ones.

Instincts Theory

Instincts theorists tried to explain the motives of behavior based on instincts and pointed out that each activity performed by a human is linked to instinct, for example, man seeks food because of the instinct of searching for food, the mother loves her children because of the instinct of motherhood. Moreover, these instincts are subconscious and inherited, non-educated or acquired, and is common in the same gender. The instinct, from Sigmund Freud's perspective, is a physical function, as it is caused by physical, external stimulation, impulse, or tension towards a particular topic to reach something, achieving pleasure and fulfillment. He also pointed out that the individual is driven throughout his life by the instinctive energy he called libido. It turns out that instincts are only physical needs forced by the physical nature human body, its structure, functions, and organs. Therefore, the principle of, what was called, searching for food instinct is the body's need for certain elements that generate energy for doing his activity. On that, the instinct to searching for water is basically the need for a certain amount of water or it will stop performing its functions; the same applies to the sex drive, as it is due to glands of particular activity and secretion of certain hormones that generate sex drive.

Activation/Arousal Theory

Wittig indicated that activation/arousal concept in motivation areas assumes that the individual has a certain level of activation/arousal and that behavior is

directed to trying to keep this level (Wittig, 1992). This means that if the stimulants of the environment are high, the behavior is driven to trying to reduce the activation/arousal level, while if the activation/arousal is very low, the behavior would then be driven to trying to raise the level of activation/arousal. Despite both the drive theory and the inverted U model concepts have a different theoretical core, the different conditions of motivation can be interpreted on the basis that activation/arousal is the motivation for the performance or behavior, as the drive theory suggests that the relationship between motivation and performance is proportionality. The higher the levels of motivation, the better the behavior or performance. While the inverted U model essentially indicates that the higher the levels of activation/arousal, the better the behavior or performance to a certain point and then the increase in activation/arousal (motivation) lead to decrease in the level of behavior quality or performance.

Social Learning Theory

This theory, in the field of motivation, suggests that previous learning is one of the main sources of motivation, as the success or failure of response leads to recognizing aspects, which may lead to positive or negative results. Hence, the desire and motivation emerge to repeat the successful behavior and learning by observing the success or failure of others may be enough to produce motivation.

Alberto pointed out that social learning theory is based on learning by mobilizing or the ability to learn by observing or imitating others. Thus, when an individual observes the behavior of others, he will be able to perform some or all of this behavior. For example, the trainer offers a model for a certain kinetic skill, the shooter by observing this model is driven to learn and try to imitate him accurately as possible—as if the motivate of performance is resulting from his observation and drive to try to imitate him (Bandore, 1990).

Why do children play, not only in sports activity, all forms of play? Philosophers and scientists have tried to answer this question for a long time but recently it has been possible to explain it in the view that a child is born having a certain amount of excitement, namely the need for excitement or pleasure. Moreover, there is an optimal level of excitement in the case of the shooter as when the excitement level is very low, he feels bored, and when it is high, he becomes afraid or worried. More importantly, the state of optimal excitement occurs when the shooter breathes throughout the activity, as he loses the sense of time and feels that everything is going properly when he does not feel anxious or bored. Excitement is a self-reward motivation for the shooter, so he participates in shooting sport to enjoy the experience only. Here comes the coach's role in making the practice of shooting an enjoyable experience.

Trends to Make the Practice 'Experience' and 'Joy'

- * Teach skills that are within the limits of the shooter's capabilities and of suitable difficulty to evoke him; not very high, so not to be concerned and anxious; not very low so he feels bored. When the degree of difficulty is in the level of the shooter or a little more, they become a source of fun and excitement.
- * Be sure to increase the amount of activity for each shooter and avoid increasing waiting periods or not participating at all.
- * Avoid giving instructions constantly during training or playing and try to provide opportunities for the shooter to enjoy the playing or kinetic activity. Shouting and giving instructions during competitions make the shooter lose the chance to have fun and excitement experience.
- * Avoid exaggeration in assessing the behavior and performance of the shooter as fun experiences do not happen when he feels the pressure of constant assessment, by coach or himself, whether positive or negative

assessment that an appropriate time should be devoted to assessment—but not during the involvement with the activity or competition.

- * Be sure to provide opportunities for fun social interaction as the shooter finds it amusing and enjoyable to be with his colleagues. Do not increase the spirit of competition between team members so that each one feels that he is against the other but support cooperation, love, and belonging.

Emotions in Shooting Sport

As the shooter continuously interacts with his environment, and carries out processes such as training, competing and connecting with others, events, objects and even with himself, he may feel the sense of joy, enthusiasm, or pleasure, and sometimes feels anxiety, stress, or discomfort for some reason. All of these are self-experienced emotions the shooter goes through, called emotions. In fact, they are self-developed responses that have stimulants, functions, and outcomes. They also may have some real-life consequences, ideas, or just internal perceptions. Emotions have external references or expressive movements such as facial, extremities, or body expressions and internal changes such as high heartbeat rate and fast breathing.

In view of that, an emotion is a state of self-unconscious in a living creature accompanied by physiological changes whether internal or external manifestations that often express the emotion's type. Hence, it can be divided in terms of impact on the player activity and the general state of tension of an individual into two types:

- Positive emotions or pleasant: happiness, joy, security, success, win, etc.
- Negative emotions or unpleasant: Grief, fear, anger, hatred, etc.



Characteristics of Emotions

Characterized by emotional experiences the following characteristics:

1. Subjective: Emotional experiences are always subjective, as it varies from player to another depending on the degree of realization of material things around, the different positions he goes through, as well as his relationship with others. In fact, a shooter may feel angry or upset when he sees phenomena or someone, while another shooter may feel joy and pleasure. However, another one may not respond at all.
2. Diversity: the shooter's life is full of numerous emotional states such as joy, sadness, shyness, remorse, anxiety, hatred, much more of the terms that reflect the many cases of emotional states.
3. The difference in degree: Emotions are different in degree, e.g. the joy when seeing a friend, succeeding in an exam, or winning a sports competition is not the same, but uneven in intensity or degree. Therefore, we can look into emotional degrees as a one-dimensional line—from the highest to the lowest degree.
4. Organic changes and external changes relationship: Different emotions relate to many phenomena, physiological internal changes in the organs of the body, as well as multiple types of manifestations and external physical changes that often reflect the emotion's type.



Physiological Manifestations Associated with Emotions:

Since they are self-internal states characterized by physiological changes that differ from emotion to another and are the changes of the circulatory, heart, the respiratory and digestive organs, internal secretions glands, and muscle:

- The mentioned change is in the increase of heartbeats rate speed, blood pressure, the breadth and narrowness of blood vessels, and fast or slow blood flow to the organs.

For breathing: Emotions are associated with excessive activity in muscles work, as well as speaking up, as breathing movements play a major role in reflecting emotions because it does two functions:

- First: Strengthening the gas exchange process, and therefore ensuring to supply the muscles with oxygen.
- Second: Allowing the air to rush from the glottis and ensure the necessary audio cords vibration.

Digestion and glands activity: the shooter sometimes feel high pressure, which, in some cases, may cause obstruction or interruption in movement of the intestines. Canon was able to, by scanning the peristalsis, to notice a stop in the case of fear. Some changes can be observed due to changes in the marrow secretions.



Psychogalvanic Reflex: Feret and, the Russian, Trkanov could prove that the body's resistance to the electrical current decreases in the case of stimulation and increases in the case of relaxation. As we can measure the body's resistance, this phenomenon is called the psychogalvanic reflex. We use the galvanometer to measure the mentioned resistance of an individual by holding its two ends while

being under an emotional impact, the index goes up to refer to low electric current resistance, and thus a state of emotional impact.

Based on all the above, we find that emotional processes contain a lot of changes in all the functions of organs; thanks to Canon who explained the positive important role of the emotions, as they make the individual in a state of readiness, allowing him to use maximum energy to achieve environment adoption factors.

External Manifestations Associated with the Emotion:

Emotional experiences are not related to internal changes only, but usually include many of the external manifestations that come into existence in:

1. Expressive face movements.
2. Expressive movements of all parts of the body.
3. Voice expressions.

Anxiety

Definition

It is a physical, psychological confusion features widespread fear, a feeling of insecurity, and the expectation of a disaster; it can escalate to the point of panic.

The concept of anxiety in the sports field:

Anxiety is an extreme, mysterious fear possesses the individual and causes him a lot of chagrin, distress, and pain. It is a general feeling and is of the most important psychological phenomena that affect the performance of athletes.

This effect may be positive and motivate them to do more or negative that impinge on performance. Anxiety concept is used to describe the severity of the behavior and the direction of emotion and it has types:

- Anxiety state: A temporary variable quality reflects the degree of anxiety.
- Anxiety trait: It is fixed and involved in shaping personality.

The Impact of Anxiety on the Shooter

Shooters express their personality's aspects in all achievements including emotions and behaviors, as sports achievements do not depend on developing the physical and skill structure only, but also are influenced by psychological factors such as motivation, thinking, anxiety, etc.

There are two types of anxiety state in the sports field:

- Type I: When the anxiety is the stimulant and assistant of the shooter which support his knowledge and awareness of the anxiety source and thus prepare himself.
- Type II: When the anxiety hinders and impinge on the shooter.

The methods of recognizing anxiety for the players:

As the coach notices the behaviors during the performance, he can identify the degree of anxiety of the players, for example:

- I. Committing many mistakes can be interpreted as anxiety, especially in competitions.
 - II. Anxiety may appear in the performance of critical positions in the form of random shots (random performance).
 - III. Not sticking to the planning duties and forgetting it during the competition is an indicator of rising anxiety.
 - IV. The tendency of making up injury may be an indicator of competition anxiety.
1. Identifying the type of anxiety (physical - cognitive) that distinguishes the shooter:



Studies suggest that there are two common types of anxiety strike players:

- Physical anxiety.

- Cognitive anxiety.

The characteristics of physical anxiety include stomach disorder, increased sweat, and high heartbeat rate.

The characteristics of cognitive anxiety include an increase in negative thoughts. It is expected that physical anxiety will affect physical performance, while cognitive anxiety will impact on mental processes.

2. Identifying the appropriate level of concern for the shooter:

Almost no psychological preparation specialist disagrees on the impact of the players' emotions and its impact on the level of performance, but the question is 'how emotions affect the performance?' Actually, directing the emotions of the player depends on two main factors:

The Nature of the Sports Character

The nature of the situation:

It is important for the coach and the shooter to realize that anxiety does not affect the performance and that way of responding to it is what affects the performance.

The prevailing concept of the sports field is that anxiety does harm and should be ignored or forgotten, though this is totally wrong. In fact, this concept may lead the shooter to be more worried and anxious before the competition, as continuous encouraging, emphasizing on the significance of the competition and the need for excellence as well as achievement, not to mention repeating the talk of reward and punishment may result in negative consequences reflected on the performance. Therefore, every training and psychological preparation specialist is to know that potential impacts taking into account individual differences.

The Psychological Preparation of the Shooter

Modern sports training science depends on scientific foundations that achieve comprehensive growth for the various elements of the preparation, whether

physical, skill related, planning, or psychological elements, to make the shooter reaches the highest levels of the sport.

Psychological preparation is one of the necessary elements of the training module; without it, no one can achieve success in shooting sport. In the recent years, psychological elements have become increasingly important, as practicing sports training does not mean developing the physical characteristics and composing the kinetic capabilities only, but also means improving the psychological qualities and honing the shooters' strength psychologically. Thus, it requires from the shooters to show psychological qualities to achieve high results.

Psychological Preparation Goals

1. Building and the forming positive tendencies and attitudes towards practicing the shooting sport with stimulating the motives.
2. Developing and employing the mental capacities contributing to the success of the performance in the framework of shooting practice.
3. Providing educational guidance and psychological counseling for athletes during the stages of training and competition to offer the best conditions for the best performance.
4. Developing and employing the personal attributes of the shooter associated with the practice of shooting to support athletic achievement.

Factors of Achieving Psychological Preparation Goals

1. Believing or not in the effectiveness of such methods.
2. The relationship between the player and the coach as well as the impact of the latter.
3. The training age of the shooter.
4. Choosing the most appropriate times of psychological preparation.
5. Standardizing the conditions of the exercises.
6. The trainer should be a practitioner of the sport he trains.

7. Conducting useful psychological exercises (self-preparation) to achieve relaxation and calmness in a dark room far from noise and of suitable temperature.
8. The shooter must take the appropriate position for the performance of those exercises.
9. Increasing and repeating the performance of hypnotic, psychological exercises rate twice a day does not result in any harm to the shooter.

Steps of Psychological Preparation

The coach should begin from a solid point to build the psychological preparation of the shooters, as understanding the psychological characteristics of each individual is vital to building it. That is as follows:

1. Knowing the type of psychological characteristics of each shooter in order to find out the best ways for him and the shooting sport.
2. The coach must teach the shooter how to avoid emotions and maintain self-control for the sake of his interests and the interests of the team.
3. Learning the psychological, motivational, and stimulating methods aim to prepare the shooter for participation in training and competition.
4. Merging the psychological preparation with the skill and physical preparation of the shooters.
5. Conducting psychological preparation in pre-competition period and during the competition.
6. Identify the vulnerable psychological features of the shooter to emphasize it in the psychological preparation program.
7. Applying the training models in conditions similar to the location of the competition, playing in weather similar to the country of the competition, as well as including, in exercises, all the variables that may happen to the shooter.

8. Applying psychological preparation for the purpose of relaxing and calming after the match.
9. Applying psychological preparation that helps the shooter to overcome some difficult, negative situations in both exercises or competitions.

Types of Psychological Preparation

- * First: Long-term psychological preparation
- * Second: Short-term psychological preparation

Long-term psychological preparation: In shooting sport the planning of long-term preparation begins as soon as the shooter participate in training at an early age and lasts for up to 10 years or to retirement. This kind of preparation is considered as the basis for short-term psychological preparation and its applied operations rely mainly on two aspects:



1. Building and developing the personal characteristics of the shooter
2. Building and developing motivation

The most important goals of this kind of preparation are to develop the athletes' motives towards the sport and help them acquire new strong motives. This happens only through good preparation, not to mention that these motives will help to continue the struggle and exert more effort. As a result, the shooter will develop positive attitudes leading to fix his personal components that are necessary to succeed in his sport. To achieve long-term psychological preparation, use the following methods:

1. Grant an opportunity for the shooter to struggle, depending on the level of his abilities.
2. Help the shooter to evaluate and compare his results to his colleagues' results of the same level.
3. The shooter must participate in sports competitions.

4. Make the shooter get used to making effort and struggling to win.
5. Pay attention to the health status of the shooter.
6. Be clear with the player, pay attention to the training process, and believe strongly in him, as that increases the motivation to improve the level of this shooter.

Short-term psychological preparation: This kind of preparation is to prepare the shooter psychologically before participating in the match, reaching a state of readiness that qualify him to exert the utmost effort and achieve the best results during the race.

Short-term psychological preparation seeks to mobilize and activate the abilities of the shooter to compete with the highest level.

Sometimes, shooters experience some



conditions before competitions including sleep disorder, insomnia, or increase in the degree of stress and excitement to the point of cramping, fatigue, lack of thinking, low degree of enthusiasm, and not caring about participating in the competition. Thus, the short-term psychological preparation is to exceed all of these things the shooters may experience before the competition. However, having a good mood before the match is an important factor to reach a peak in achievement. There are some ways of short-term psychological preparation for shooting, as follows:

1) Alienation:

To use the various ways and means which for making the shooter avoid thinking about the competition.

2) Charging:

One of the psychological charging methods for shooters employed by coaches is to draw the attention to the significance of the game, repeat the important points that must be considered, and remind them of the gains of winning, etc.

3) Massage:

Sports massage is used as an assistant factor in relaxation due to being able to calm the muscles and improve the functioning of blood circulation. Also, it significantly affects the psychological aspects of the shooter, providing comfort, removing anxiety and tension.

Nonetheless, the coach has to take into account several points affecting the short-term psychological preparation such as the age of the shooter and his experience, as any junior's preparation is to be based on highlighting the positives, while preparing advanced shooters is to include appreciation and full consideration of the different circumstances in view of modesty and enthusiasm. In addition, the coach, on the last day before the game, must stick to the following:

1. The psychological preparation on this day is based on providing the most confidence among shooters
2. The shooter or the team should know the strengths in their technique.
3. The shooter should be ready to perform under all circumstances and variables of the game.
4. The coach must train the shooter to have a psychological influence on the thinking of the competitors.
5. Finding typical pre-match training positions for the game.
6. Providing a calm atmosphere for the shooter especially at night of the game to sleep and relax.

The Role of the Coach in the Day of the Match

1. Working on how to make the shooter controls his emotions and mood.

2. Providing a suitable warm-up to raise the readiness and mobilization required in the shooting sport.
3. Providing psychological preparation until the last seconds before the game, as it is required to have full readiness to start the competition
4. The coach must make the shooter feel stability and gain the desire to win.

The role of the Coach During the Match:

1. Employing psychological training based on words to prepare the shooter for unexpected circumstances.
2. Spreading the spirit of enthusiasm and optimism in the psyche of shooters.
3. Working on making the team united, each one has duties without waiting to see what others do to share responsibility.
4. Using the objective criticism method without offending any of the shooters.
5. The coach is to intervene immediately if he feels a deterioration in the position of any of the shooters as if observed any of them away of the full psychological readiness for their match.

The psychological States of the Shooter during the Competition:

Shooters experience psychological pressures accompanied by anxiety and tension during the sports competitions. The states are as follows:

First, the state before the beginning must be defined:

It is the stimulation and suppression operations of the brain and is divided into three cases:

- * Initial fever
- * Apathy
- * Readiness to struggle

1. Initial fever: An increase in the stimulation operations and a decrease in the suppression operations, e.g. when the shooter wants to pee before the start

of the competition directly, feels pain in a body part or suffers from a muscle strain, etc.

2. Apathy: A decrease in stimulation operations and an increase in suppression operations, e.g. when the time of the competition has come and a shooter feels that he is not ready to compete or unwilling to participate in the competition.
 3. Readiness to struggle: A balance between stimulation operations and suppression operations in the brain, e.g. when the shooter feels that he is prepared and ready to compete to the greatest extent possible.
- 1) In 'initial fever', the shooter is stressed, hasty, and perform hastily and make errors.
 - 2) In 'apathy', the shooter is almost lethargic, perform slowly, and make many errors.
 - 3) In 'readiness to struggle', the shooter is active and ready psychologically and make mistakes rarely.



Now that we know the state before the beginning and its three cases, let's look for solutions:

The solution to overcome the 'initial fever' or 'apathy' could be treating the shooter smartly, while the other solution could be the objective way—the shooter overcomes the problem himself. For the shooter to be able to prepare himself and avoid the 'initial fever' or 'apathy', he must first know what are the three cases and choose the 'readiness to struggle'; if he felt that the stimulation is more than suppression, he should try to calm himself, and if felt that opposite, he should encourage himself.

Mental Training

Psychological Skills of the Shooter

Definition

Psychological skills play an important role in accomplishing sporting achievements that overlooking this role impinges on the performance greatly. Thus, using such skills and developing it must accompany improving the physical fitness and is to be considered as much as strength, speed, and agility, as each of them contributes to reaching the ideal performance. The following are the most basic psychological skills:

- 1) Relaxation
- 2) Mental visualization
- 3) Focusing attention



First: Relaxation

Generally, relaxation is one of the main themes of getting rid of tension and anxiety and is characterized by the absence of activity and stress. Moreover, it is a period of calmness and avoiding the use of the senses. Relaxation is one of the basic elements in preparing for competitions, as it contributes to the reduction of unwanted tension and stimulation that can arise in such circumstances.

Relaxation definition:

The absence of any contraction or tension in the muscles or reaching the point of no muscular activity.

Second: Mental Visualization

Recalling the image of the skills, previous experience, or events and situations never happen before.



Moreover, the shooter can recall his feelings and emotions associated with this position.

Types of Mental Visualization:

External visualization: The player imagines himself as if he is watching a movie, or watching himself on videotape.

Internal visualization: The player sees himself as if there is a camera mounted above his head, capturing images of all the things he sees during the performance.

The Absence of Mental Visualization:

It is the absence of any previous form of visualization whether internal or external forms but the player goes through the experience via the sense only.

Third: Focusing Attention

Focusing attention is one of the important mental skills, which is the basis for succeeding in the process of education, training, or competition in its various forms such as recognition, thinking, remembering, and expecting and is the ability to focus the mind on a particular topic by selecting the sense.



Definition of Focusing Attention:

The ability to fix attention for a selected period of time.

Skills of Attention

Attention skills include:

1) Selecting attention:

The ability to choose the correct stimulants or symbols that the player is to focus the attention on among many variables.

2) Shifting attention:

An ongoing process between the stimulants in the environment to try to choose the correct responses that achieve the goals. In the sports field, it is to move from

the inner self to the atmosphere of competing according to the situation and must deal with internal and external changes, whether in training or competition. That requires effective attention, control, and shifting the attention ability and its direction. It is important that the athlete learns how to shift attention in terms of area (wide- narrow) or direction (external – internal).

3) The intensity of attention:

One of the important skills of attention, as after choosing the right stimulant and having the ability to shift attention, the player must have the ability to focus his attention intensely at specific times. The player must prepare for the performance in order to get an effective one. It is known that visualization is a part or stage of mental training and that kinetic learning process is divided into three phases:



1. Raw stage (raw coordination).
2. Development stage (developing precise coordination).
3. Retaining stage retention (the automatic mechanism).

Visualization can be used in the second stage of learning as an assistant factor that develops the process of kinetic learning, its mastery, and develops the mental and cognitive aspect of the player.

The mental visualization: It is a reflection of manifestations and things that have been already experienced in the past that do not affect him at the moment of visualization. Visualization is less clear than perception.

The mental perception: It is a reflection of the external things that affect the individual directly at the moment, occurring as a result of nerve stimulation matching in the brain and is characterized by the nature of stability more than visualization.

The Difference between Imagination and Visualization:

Firstly: The concept of imagination

Imagination is the flow of waves of ideas that you can see, hear, or sense, as we interact mentally with everything through the pictures. Meanwhile, images are not only visual but maybe smell, texture, taste, or voice; it is an internal expression of your experiences or illusions and is one of the methods through which your brain encrypts and stores information as well as express it. However, it is a tool by which our minds interact with our bodies.

Types of Imagination and its Development:

Imagination skill needs training daily in order to be strong—usually a week to a month. Here are the types of imagination and its examples:

1. Visual imagination: The most beautiful picture of you, a wall clock, a tree, a red car.
2. Auditory imagination: Rain voice, the voice of your mother, the voice of the wind.
3. Tactile imagination (touch): Fur texture, marble texture, the texture of a hot surface.
4. Olfactory imagination (smell): The smell of fried fish, the smell of favorite perfume, the smell of mint.
5. Gustatory imagination (taste): The taste of the tea, the taste of grilled potatoes.
6. Visual kinetic imagination: Meteor burning in the air, imagining that you run.

Usage:

These images are used to generate a deep state of contentment and pleasure. For example, you can, when you feel a deep relaxation, imagine yourself calm pleased



as you merge this sense with the sense of coldness that you felt at the end of the exercise; a subjectively generated model. In fact, you can imagine yourself in an iced place frame or in a relaxed state walking slowly on a meadow covered with ice or imagine any other image other than the feeling of the heat and annoyance. Regardless of the mental image, you draw in your mind, it is necessary to first achieve relaxation before mental imagination.

Psychological Characteristics of Shooters

Before we delve into the details of the psychological characteristics, needed by the shooting player, we must refer to that sports psychology scholars assert that playing a sport influences, greater than any type of activity, on the development of volitional personality traits. There are differences in personality, not between the athlete and non-athlete only, but among the athletes themselves, according to the sports activity. Actually, we find that every athlete has psychological characteristics depending on the nature of his performance within his sport, as some require courage and boldness such as diving and gymnastics while others require rapid reaction such as running and swimming. Also, there is the third type that requires the ability of team play, for example, team games.

On that, every sport has conditions and requirements in terms of building and composing personality. However, in shooting sport, some personal characteristics, other than mental health, are extraversion, toughness, boldness, self-confidence, high ability to withstand pressure and adversity, the love of control, belonging to others, discipline, organization, ambition, etc.

The most important psychological qualities that the shooter should have:

1. Will, perseverance, and determination.
2. Intention and struggling for the win.
3. Courage and firmness.

4. Self-confidence.
5. Obedience and respect.
6. Altruism.
7. creativity.
8. Intelligence.
9. The ability of isolation.
10. Positive thinking.
11. Performing under pressure.
12. Directing ideas.
13. Controlling emotions.
14. Analyzing ability.

Important Psychological Features for shooters

Many psychology researchers pointed out that acquiring and developing the psychological characteristics of athletes is among the most important components of long-term psychological preparation due to its direct impact on the character of athletes.



Some psychological traits that the shooter should acquire and develop and develop within the long-term psychological preparation processes are as follows:

| | |
|--|---------------------|
| * Purposefulness | * Decision-making |
| * Self-confidence | * Controlling ideas |
| * Isolation | * Independence |
| * Self-control | * Courage |
| * Psychological health | * Toughness |
| * Politeness and will | * Boldness |
| * Facing pressure during the performance | |

We will interpret some of the features of the shooter:

Purposefulness

The ability to identify clear goals for development and pursuing them seriously.



Methods of developing purposefulness:

Define clear objectives (The clarity of purpose leads to it).

Self-confidence

The belief and trust in one's athletic ability and skills to perform. High sporting confidence is among the most important features of shooters of high achievement motivation. Methods of developing confidence:

- Self-talk.
- Self-affirmations (summoning motives and the desire to enjoy competition).
- Stopping negative thinking and turning it into a positive one.

Independence

The ability to aim at the goal initially, creatively, and smartly without influencing the behaviors of others.

Methods of independence development:

- Assigning the shooter with certain tasks or duties.
- Assigning the shooter with analyzing his strengths and weaknesses.
- Participating in competitions without relying on the guidance of the coach.
- Employing various exercises and plans that require initiation.
- Distributing organizational, administrative, and technical duties on all team members.

Perseverance

The ability to keep activity for a long time until reaching the goal and not to give up even when facing unexpected difficulties.



Methods of perseverance development:

- Choosing an idol of the professionals.
- Grading in increasing the training and competition load.
- Forming sports training or competition in a particular image linked to the emergence of some obstacles or sudden difficulties.
- Determining certain levels for the shooter and encouraging him to achieve them in a given period.

(physical qualities, kinetic skills, planning capabilities)

Self-control

The ability to control behavior during tough situations that feature overwhelming emotions such as failure, defeat, overload, or facing obstacles.



The qualities of the self-controlled shooter:

- Lack of fear, confusion, or giving up in the case of failure or defeat.
- Shows no obvious symptoms of anger, or nervousness for some arbitration decisions that are not in his favor.
- The ability to control internal conflicts and control himself and his emotions.
- Shows no depression or deep sadness when encountering an early defeat.
- Does not lose hope to win and struggles to compensate for the defeat and improve the result recorded.
- Can respond with suitable emotions to different situations in the course of the competition.
- Can think properly in sensitive positions in the game.

Methods of self-control development:

- The coach must possess this quality, first.
- Draw the attention of shooters to the behavior contrary to this quality.
- Reinforcing positive behaviors.
- Organizing the participation of the shooter in experimental competitions to the development of self-control quality.

Courage

It is of the volitional features that work on directing the emotions properly in serious situations, and attitudes. Also, it allows the shooter to overcome fear.

(Closely related to the determination feature)

Methods of courage development:

- Exposing the shooter for situations require courage.
- Eliminating fear from the mind of the shooter.
- Providing security, safety, and self-confidence factors, especially in the kinetic performance.

- Engaging the shooter in some sports activities that contribute to the development of courage feature (boxing- gymnastics- diving).

Toughness

This feature appears in the shooter in the following aspects:

- When confronting difficulties.
- Not giving up in cases of defeat or not succeeding in the play.
- The ability to withstand criticizing without going mad.

Methods of toughness development:

- Assigning the shooter with performing some tasks that cannot be achieved without using such a feature.
- Making the shooter get used to facing various obstacles and difficulties gradually according to a specific plan, such as:
 - Training during rain, hot, or cold.
 - Playing and struggling in the case of any shortage of number in teams, injury, or expulsion.



Politeness and will

Congenital and volitional features play a key role in the formation of the shooter's personality that significantly contributes to upgrading the level of abilities and preparations. Politeness is of the most prominent personality traits that distinguish athletes from non-athletes (an acquired, social feature that is based primarily on the attributes approved by the group and seem clear) and is almost fixed in the behavior of the individual. Politeness is not limited to simply one trait but is a composition of a full range.

Psychological features:

- * Tendencies and behaviors towards others (respect, affection, friendship, brotherhood, trust).
- * Tendencies and behaviors towards the external community (loyalty to the team and community).
- * Tendencies and behaviors towards his work and his activity (perseverance, love, commitment, innovation, attendance)

Developing the politeness:

- * The responsibility of moral education is the responsibility of educational means: family - school - club - coach.

Psychological skills of the sport of shooting:

Psychological Skill: An ability could be learned and mastered by learning and training sessions, such as skills (aiming and stability); shooters cannot acquire and master it without learning and training. Psychological skills that should be learned in the long-term psychological preparation are as follows:

- * Relaxation skills
- * Visualization skills
- * Attention skills

Individual Differences in the Sport of Shooting

Factors of Individual Differences:

First: Genetic Factors

The genetic factor plays a vital role in acquiring the personality traits of the shooter and even the relatively stable ones that normal environmental factors cannot change. The impact of genetics in determining different ratios of mental capacity or physical ability of the shooter include:

1. Physical type
2. Maturity

3. The ratio of the female and male hormone

Second: Environmental Factors

Those factors that are composed in the first moment of forming the embryo to the first day of birth along with the subsequent life. Environment affects the formation of the character, habits, and the influence of the society in which the individual lives. The factors are:

1. Geography
2. Society
3. Culture

Third: Education and Training

The kind of education and training to highlight the individual differences, these factors that affect the individual differences include:

1. Mental preparation
2. Physical preparation
3. The period of the training
4. Maturity and readiness
5. The improvement of the level
6. Age

Fourth: Nutrition

The body is affected by the amount of food intake, especially in the necessary tissues and cells formation stage of the child's growth stage in which the body builds his health, energy, and protein. Nutrition can also be related to the environmental factors; the society that has good nutrition is to be healthy, especially if the following components are available:

1. Carbohydrates
2. Fats
3. Proteins

4. Vitamins
5. Water and salts

Individual Differences Sections

1. Differences between the shooter and himself

As shooters are different in terms of their abilities and personal traits, the shooters' capabilities and characteristics differ in terms of strength and weakness. In fact, he may be a highly intelligent shooter but weak-willed or suffering from mental illness. On the other hand, he may be superior in musical ability and below average in language ability or be skillful in handling machines and not as such in dealing with people.

2. Differences between the shooter and the last

Shooters differ regardless of gender and race, especially, the physical differences including length, obesity, speed, flexibility, or mental intelligence ratios, as well as differences between of age.



3. Gender differences

There are differences between males and females in the composition of the body and its organs; these differences are the following:

- 1) Anthropometry differences (physical measurements).
- 2) Functional differences.
- 3) Psychological differences.
- 4) Maturity and growth differences.
- 5) Hormone secretions differences.

Types of Individual Differences in the Sport of Shooting

- 1) Physical individual differences.
- 2) Technical individual differences.
- 3) Tactical individual differences.

- 4) effectiveness individual differences.
- 5) achievement differences.
- 6) Age differences.
- 7) Gender differences.

Shooting and individual differences

Individual differences as mentioned are the differences and variations in mental, physical, and kinetic ability; the most important reasons for the



development of higher levels are these differences. For this, we see high achievements and ranks at the level of teams and individuals; without these variations, there will be no achievements.

All events of shooting competitions are controlled based on some components or on a training system which takes the individual differences into account. The athlete who controls parts of his body should have high visualizations such as attention, focusing, thinking, as well as volitional muscular effort for a certain period. In Target Sprint, for example, the shooter who beats his colleague, who has been subjected to the same models and training systems, is capable of generating a bigger amount of power than his colleague. We define this energy as levels and take into account the following individual differences:

1) Physical preparation of the shooter

The physical preparation is uneven in training models in terms of time and that appeared during the shooter's exercise and any flaw (physical preparation) shows individual differences. Consequently, the physical ability of the shooter may appear and that is considered of the individual differences.

2) Skill preparation of the shooter

Readiness and tendency are very important in the preparation of a high-level shooter and spending years of training on this matter is vital.

3) The period of training

Any difference in the period of training leads to the possibility of a malfunction in individual differences. Needless to say, one who has a four-year of training differs from who has a three-year training—or any difference in the seasons of training even if these shooters are in the same age and activity.

4) The level of readiness

The readiness and maturity to accept a game are different in the shooters of the same age because their maturity is different. The readiness of learning a sport like swimming starts from four years to five and there are some individuals accept the sport in four years, while others accept it in five years.

5) Gender

- Male
- Female

6) Age

The age of the player.



Communication Skills

Communication between the coach and the shooters

The significance of communication between the shooter and the coach has become critical that it changes, in a moment, the team's tactical details and perhaps there is harmony between the coach and the shooter in understanding the means of communication in order to get positive results for the team. Communication in the shooting sport is vital that it is classified as one of the most important training elements.

- The key points of success of the coach: The ability of contact players, press, administrators, parents, and the public.



The three dimensions of communication:

- Communicating verbally with others and vice versa.
- Facial expression - hand signal – speech.
- 70% of the connection is without sound.
- Signal content and movement.

Communication includes two things:

- Content and passion.

Content is the essence and passion are how you feel about the essence, which is usually oral; passion is not verbal.

- Receives, sends
- Without a signal, with a signal
- Passion, content.

How to communicate

Communication includes steps:

- * The idea to be received.
- * The formation of the idea to deliver a particular message.
- * Delivery Method.
- * Sending the message.
- * The message should be specific and clear.
- * Do not always judge, correct errors, or evaluate the shooter.

Harmonious Communication

A behavior illustrates the desire to understand communication, accept others, and build a relationship with mutual respect.

- * The coach is to ask shooters to show their ability to control their emotions during play.
- * The coach is also to show this ability formally.

- * The coach is to ask shooters to show mutual respect.
- * The coach is to emphasize the significance of fitness while making himself a role model.
- * Raising the confidence of the shooter and his self-estimate.
- * The coach is to promise the shooter an award or incentive and then fulfill his promise.

How to listen to others:

- * Focusing on listening means that you're mentally aware of what was said.
- * Accustom yourself to listen.
- * When you listen, search for the content of the message, not the details.
- * Avoid interrupting players.
- * Respect the right of the players to express their opinion.
- * Show respect and appreciation for what was said.
- * Develop the non-verbal communication.

There are five forms of developing body language:

- Body movement includes distance, hand, head, foot, and the rest of the body's movement.
- * Shooters should receive the message.
- * Understanding the message (the ability to understand the message).
- * Responding to the message.

Why communication between the coach and player becomes pointless?

- The message is unclear, as the content may be wrong according to the situation.
- Lack of understanding of the message because of the weakness of verbal and non-verbal skills.
- The shooter must listen to the message.

- The shooter did not understand the message.
- The shooter could understand but couldn't execute.
- The message is opposite to the time making the meaning confusing to the shooter.

The coach is to develop communication skills.

- Develop your situations with shooters and the match
 - * Be more cooperative.
 - * Be more aware of your sport or at least honest about the information you know.
 - * Be reliable, just, and consistent.
 - * Be warm, friendly, and understanding.

How to be positive

- Commit compliment and give rewards to promote what you want.

This method boosts the shooters' self-confidence and is a behavior that shows a desire to understand, communicate, accept, and respect others.

- The fitness of the trainer is very important for better implementation.
- Behaviors, such as patting on the shoulder, high fives, laying on the shoulder of the shooter, are appreciated and encourages positive connection.
- Voice features, quality, rhythm.
- The body posture and the distance between you and the shooters.

Chapter 14

Training

Training

Introduction

Training has become increasingly an essential process in contemporary societies according to the individual's lifestyle, in general, as well as his needs. As training's goal is to change the patterns of one's behavior by directing him to the best methods according to his personality and factors that determine his attitude, it escorts the individual to adapt to his circumstances and balance the ever-changing environmental conditions out. Training is a contrivance, not a goal, as it allows the individual to perform his duties of the highest level of efficiency, develops physical, functional, and psychological abilities to benefit himself and the community. Broadly speaking, training is 'the continuous, organized preparation process to develop one's abilities constantly and increase the level of efficiency to perform a specific act in order to achieve a specific goal, increasing the productivity of the individual and community'. Sports training is a form of training



that increases the level of sports achievement in order to reach high levels in a certain sport.

The Operational Definition of Sports Training:

A planned educational process based on scientific foundations and pedagogical rules aims at reaching the highest level of a sport via developing the physical ability, kinetic skills, planning process, and mental capabilities of the individual as well as enhance his motives, personal and volitional traits.

Characteristics of Sports Training

Sports training is rather different than other life's fields. If the training is to prepare the player for performing the activity, it is, then, an educational duty for sports activity. On the contrary, if the training is to prepare the player for upper levels in order to achieve high-level results, it is, accordingly, a training, educational, physical, intellectual, skill, planning, and psychological duty.

Most Important Characteristics of Sports Training for the Shooter

- * Destining the shooter for the highest level.
- * Specializing in a type of event or private activity in the shooting sports, whether it was (gun, pistol, shotgun, Target Sprint).
- * Taking into account the individual differences, even if the results are close.
- * Developing all physical shooting abilities to be interconnected as a single unit.
- * Organizing the outdoor life of the shooter.
- * It is based on scientific foundations as well as other theoretical sciences.
- * Sports training should feature a leadership role through educational programs.

Sports Training Goals

Sports training, trainers, and training institutions seek to achieve two main objectives through the training process:

- To maintain the level of training status.
- To raise the performance level of the physical and physiological status.

These are the two primary objectives all sports training workers are to achieve. To achieve these objectives, some detailed goals are to be worked on:

- * Developing and improving general physical preparation.
- * Focusing on special physical preparation (shooting sport).
- * Controlling and mastering the technique of the shooter.
- * Improving planning performance.
- * Developing volitional qualities (perseverance, self-confidence, and courage).
- * Adopting good preparation for the shooters in teams and nations.
- * Avoiding injury, i.e. working on enhancing the health status of the shooter.
- * Applying tests and regular check-ups.
- * Increasing and enriching the information on the shooters (training system, nutrition, matches analysis, the player-coach relationship as well as the shooters' relationship with themselves, planning aspects).

The Significance of Sports Training for the Individual and Society

- * Sports got entangled with politics that sports competing became of great standing in the world.
- * Winning in competition has become a result of research, scientific experiments, and practical experiences.
- * Countries have become concerned with the exchange of information and setting up sports conferences for achieving players' safety and raising sport.

- * Practicing a sports activity has become a necessity of modern life as a result of technological evolution.
- * Practicing sports training creates a broad base of athlete youth seeking to raise their levels and discover sports gifts in order to reach the highest levels in the sports field.
- * It contributes to the psychological adjustment of the individual, as a member of the community, to meet the requirements of the community.
- * Sports training improves the health status of the individual.
- * Sports training leads to a higher functional level of efficiency and develops physical and kinetic abilities of the individual to enhance productivity.
- * Sports training upholds the values of loyalty to the community, taking responsibility, and defending the homeland, not to mention, it contributes to controlling emotional expressions.
- * Preparing the athletes to train on their own and thus training might become a job for making living.

Planning and Organizing the Training

- * Administrative and clerical planning.
- * Organizing the training

First: Administrative and clerical planning of the training

At the end of the session, the shooter will be able to:

- Know the significance of administrative and clerical planning in the training process and apply it.
- Know how to organize training (before, during, and after).
- Identify common forms of sitting in training.

Administrative and clerical planning is everything related to the training course and its organization except the training itself and cannot be watched by participants or involve in the training content.

Second: Organizing the training

The form by which the training begins sets the style it will follow through, as in the first session, shooters who do not know each other initiate impression, whether negative or positive. Shooters may be sensitive to matters such as location, coach, training materials, the expected training process. Any lack of attention in this stage of training could lead to more stress, anxiety, wrong impression, and may lead to early withdrawal from the course.

Training Location for Shooters

The training location should be comfortable as to help the trainees to focus on training. Therefore, the temperature should be suitable, the seats are comfortable, the location is spacious enough, and the lighting is adequate and manageable. Some instruments such as whiteboard, projector, papers, and pens are essential, as well. In the case of training for several hours, the location must contain clean toilets, places to rest, and places of praying; It is also appropriate to provide some drinks and desserts. The arrangement of the field may help or hinder the success of the training, e.g. when the projector is not properly set so that the coach is forced to stay put in a corner of the training room so as not to stand between the projector and screen, it is a drawback in terms of required interaction in the training process. When training stops more than once due to a hardware problem in an instrument or lack of pens to write on the board, this makes the trainees get bored and out of focus.



Rules of Training for Shooting Sport

1) General Preparation Rule

General preparation means to develop the shooter's aspects, physical and spiritual integration; adhering to this principle is vital to reach higher levels. The preparation, in common sense, is the growth and development of internal organs through all stages of training to reach the desired levels and thus getting sports results required. It is divided into two parts:

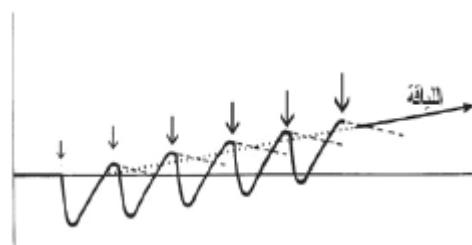
- I. General physical preparation: It is to develop general physical capacities (attributes) such as strength, speed, endurance, flexibility, agility.
 - II. Special physical preparation: it is related to the development of shooting special skills.
- 2) Regularity rule: It is to practice training programs regularly according to a plan, also applies during grading, raising the difficulty, and increasing demands continually.
 - 3) Continuity rule: The training process must be continuous and sustained to reach higher levels.
 - 4) Mensuration rule: The selection of exercises and movements suits the fitness, psychological, and technical level of the shooter as well as gender and age at all stages of growth.
 - 5) Knowledge rule: The understanding of the training's basic idea and knowing the impact of each type of exercise, as well as how to exploit the details to acquire the technical and planning skill for the shooter in a shorter time and successfully.
 - 6) Clarity rule: Giving a clear idea of the skill or any clear, correct, and complete plan in terms of technique and tactics
 - 7) Diversity and change rule: This rule emphasize the need for the composing diverse training programs in the training modules and switching to various events and exercises to avoid boredom and sloth in training.

- 8) Repetition or frequency rule: This rule defines the rate of repeating exercises, movements, as well as training modules and cycles to increase mastery and memorization of skills.
- 9) Individual and group training rule: the degree and level of each shooter's training and fitness is the key factor in the setting and composing the training modules in terms of quantity and type, whether aiming for collective competition or individual work.

Principles of Training

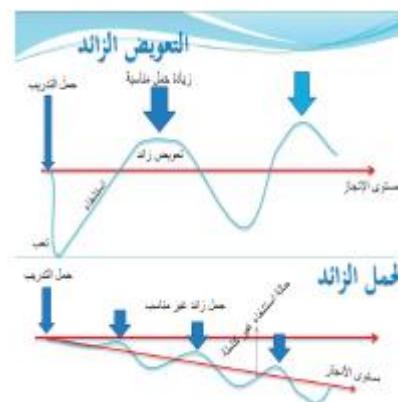
Sports training programs are designed to increase the level of performance through developing energy sources, increasing the muscle structure, and developing the muscular-nervous system skills. Professionals in the field of sports medicine have a basic knowledge of training principles through which the training program is evaluated to maintain health and prevent injuries. Training theory includes all fields of knowledge of fitness socially, psychologically, and scientifically. Trainers use this information as well as their knowledge of the player to write the best training program that can lead to the maximum performance levels.

1. Training load grading principle: The biological systems can adapt to large loads more than the daily life activities requirements. Training loads must be increased gradually to make the body adapt better and prevent injuries. Diversifying the type, volume, and intensity of the training allows the body to recover to reach excessive compensation. Increasing the training load should go gradually, allowing the adaptation, otherwise, the effect of training will stop at a certain limit and stop the development of the performance.

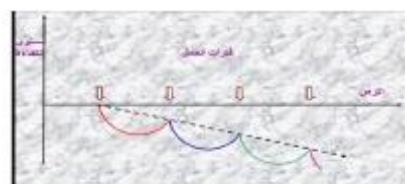


2. Adaptation principle: Adapting to training requirements occurs gradually and on a relatively long period. Efforts to speed up the adaptation process usually leads to injury, ills, or overtraining. Many adaptations are reversed due to stopping training. The unsuitable training load will not provide us with the necessary training incentives and thus the compensation will not happen. The following figure shows the effects of different training loads:

3. Specialization principle: To specialize in the suitable field of shooting various activities (rifle, pistol, shotgun, Target Sprint) via analyzing the selection models of the player and according to the capabilities of energy production, enzyme systems, types of muscle fibers, and neuromuscular responses that adapt to the type of training. For example, weightlifting exercises have relatively few effects on endurance, while endurance exercises active aerobic work lines with relatively little effect on speed and power. A good training program must contain a variety of fitness factors (aerobic, anaerobic, speed, strength, flexibility) and must work to activate the major muscle groups so as to prevent the lack of muscular balance and prevent injuries.



4. Results principle: If the shooter does not apply regular training, that will decrease the fitness and technical level. So, the body must be trained regularly and without interruption until you get the required benefit and adoption.



5. Diversity and recovery principle: Muscle groups adapt to certain training stimulant (training load) during a specified 6 weeks and then is fixed.

Diversifying the exercises with proper rest intervals allows the shooter to increase the training load without the risk of injury or severe fatigue. Training modules should be varied between the hard, easy, and average to allow recovery. The training program content should also be varied so as to break the boredom.

6. Individual response principle: Each shooter responds differently to the same training stimulant. Many factors determine the quality of the response including heredity, gender, nutrition, environment, the amount of sleep, rest, illness, injury, motivation.
7. Planning the training modules principle: The training program must contain many features such as circulatory and respiratory system fitness, general strength, anaerobic fitness, speed, amount of skill development (muscular – nervous), flexibility, psychological, and technical preparation. Actually, the amount of effort exerted on the previous characteristics of the training program should be differentiated depending on its occurrence during the training year, but also depend on the type and degree of the shooter's effectiveness and experience. In general, the basic preparation for all events must be focused on general strength and aerobic fitness. Training courses usually last 3 weeks, taking a week of low intensity before starting the next session. Skill training should not be implemented during the intense load cycle, only low training load sessions.
8. Continuity principle: Fitness and the technique of the shooter employed during high-intensity training periods can be maintained by exercising on average effort. Through training planning, some parameters remain constant, with the same efficiency, by using a low load, while others must remain on its natural state.

Experts use multiple methods, each aimed at specific physical elements of development and thus the coach uses the way that suits the goal. The methods can be divided into, according to the use of "endurance" and "comfort", the following:

- * Continuous training method.
- * Periodic training method.
- * Repetitive training method.
- * Fartlek training method.

1) Continuous training method:

This method of training features a lack of rest intervals between exercises, starts with 25% of the maximum intensity, and then ranges to 75% at the end of the preparation season. It is usually used in the general preparation season as a relationship to form the training load, in developing the physical abilities such as general endurance, and contains the following components.

The Intensity of the Training Stimulant (training load)

The stimulant's intensity starts with 25% of the maximum and reaches up to 75% at the training load. The volume of the training's stimulant, bullets, periods of the training module, and the number of sets are to be determined. Once happened, an inverse relationship between the stimulant and its volume is formed. In fact, the reason for this relationship is the dynamic content of the training load over the course of years. In this method, there are no rest intervals between exercises; whether technical exercises or muscular strength exercises, i.e. you do leg, arm, and torso workouts successively, employing the circuit training method.

Training Time:

This training method features continuous load throughout the course of the training's stimulant. For shots, it is up to 30–500 shots, while the time ranges



between 15 minutes to 5 hours. You can adopt more repetitions for strength training.

Continuous training features for the sport of shooting:

- * Training with the continuous load leads to many changes in the shooter's body:
- * Increasing the number of red blood cells and the hemoglobin level of the muscles.
- * Increasing the number of blood capillaries.
- * Muscle fiber growth.

2) Periodic training method:

periodic training method Depends on developing and improving the level of special physical abilities for the achievement of the adaptation between periods of activity, not to mention, the rest interval. The definition of periodic training relies on several elements:

- The components of the training load, which is the training stimulant intensity, its size, and the rest period.
- The level of the shooter, which is determined by his biological and training age, the level of physical capabilities and skills.
- The social and psychological state of the player (single or married and his psychological conditions).

The term of this training is primarily linked to the rest intervals, the activity itself, and the periodic training through standardized ratios for each of the repetition and rest intervals; the training stimulant is what specifies all of the mentioned. For example, in training intensity and periodic training, it is divided into two methods:

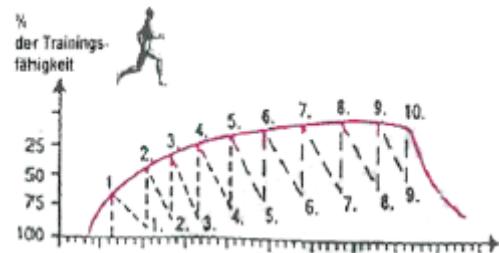
- Low-intensity periodic training.
- High-intensity periodic training.

Low-intensity Periodic Training

It develops some physical abilities, including general endurance, strength endurance, and strength. However, it can be described by the components of the load as follows:

The Intensity of the Training Stimulant

The intensity of the load should be less than average, taking into account for the endurance exercises, muscular endurance, and speed endurance be the 60–80% of the stimulant's maximum intensity.



The volume of the Training Stimulant

The less the training intensity the more training the training volume, whether in the training module or the sports season. By the way, rest intervals between exercises or sets are determined by the size and intensity.

Rest Intervals

The rest intervals are linked and depend on two factors, namely the size and intensity while determining it is by the shooter's speed of recovery which appears through the intensity of the stimulant—the relationship between work and rest. Thus, we can set the active rest intervals, the recommended rests, by more than one way, as it is relatively short, especially, in low-intensity periodic training, and determine the recommended time of rest.

The Time of the Stimulant

Strength endurance exercises are relatively limited to time, even though if you use the sets system, the repetitions in each exercise will be between 6–12 rep. As for competitions (Target Sprint), the time of the stimulant should not be more than 15–90 seconds.

Characteristics of low-intensity periodic training:

- The development of basic endurance besides special endurance.

- The development of the ability of oxygen consumption.
- An increase in the volume of blood pumped for each muscle.
- Ease of errors discovery.

High-intensity Periodic Training

It leads to the development of endurance, maximum speed, strength endurance, speed strength, and explosive strength. The high-intensity periodic training method can be described through the following components:

The Intensity of the Training Stimulant

The intensity will be, for the speed and endurance, 80–90% of maximum intensity while muscular strength is 75%.

The Volume of the Training Stimulant:

The repetition of the exercise is decreased so as not to reach fatigue. The relationship between intensity and repetition is what determine the recommended rest intervals.

Rest Intervals

It is fairly long due to the training intensity and is determined by the recommended rest intervals.

The Time of the Stimulant

The maximum time of the stimulant in each exercise should not be more than 80–90% of the shooter's level, for running only. As for the special performance or muscular endurance exercises, 75% of the maximum possible time is recommended.

Characteristics of High-intensity Periodic Training

The standardized, continuous high-intensity periodic training load features:

- * Widening capillaries faster to allow the entrance of more oxygen and mineral salts, such as phosphates and potassium, in addition to some of the enzymes of the working muscles.

- * Delaying fatigue.
- * Increasing adaptation when having a chance to put more training load.
- * Increasing the size of the heart and the amount of blood.
- * Increasing accuracy when aiming.
- * Increasing the ability to focus.
- * Muscle fiber growth.

Repetitive Training

Training according to this method should be known, especially for speed training exercises, as it adapts the body of the shooter to all conditions that may be faced during the competition. Through this method, the body improves the maximum transition speed, speed strength, and the speed of chemical reactions that generate energy. It also causes the composition of lactic acid due to the use of high-intensity exercises up to 90–100% of the maximum potential of the player. The method aims to improve speed (transition speed), maximum strength, speed strength, and the ability to endure short, medium, and long periods. It has been proven that the body adapts better in the case of repetitive work interspersed with frequent rest intervals because lactic acid is excessive in the case of repetitive training. The heartbeat rate, during repetitive training, is slightly more than {180 beats/min} by increasing rest intervals until recovery, especially the period of excess compensation before the next repetition. The chart shows the general principles for estimating both the intensity, repetition, and direction of the repetitive method's load of the training module.

Nonetheless, this method features resistance or high-speed exercise (the load of the shooter of time or shots number) and is similar to the periodic training in exchanging between performance and comfort—but differs in the following:

- The time of the performance of the exercise period, its intensity, and repetitions.

- The recovery periods between repetitions.

The method is characterized by maximum intensity during the performance that I executed like in the competition, giving relatively long few rest intervals to achieve a high degree of intensity.

The functional characteristics of repetitive training include stimulating the central nervous system, causing central fatigue due to the high-intensity exercise. The resulting chemical reactions happen in the absence of oxygen, leading to the consumption of stored energy materials, and the accumulation of lactic acid in the working muscles. The components of the repetitive training load:

- i. The intensity of the exercise's performance: 90% for jogging, 90–100% for strength.
- ii. Repetition of performance and the exercise time: Without specifying.
- iii. Rest intervals: long rest of 6–8 minutes according to the distance and is positive. Of force, taking 3–4 minutes, taking into account to be positive.
- iv. Repetition of exercise (sets): For running, 1–3 times. The number of shots is 10–20 per round in training session.

Circuit Training

The circuit training is a system/method depends on the rules and laws derived from studies and analysis of employed training load, as well as its adaptation processes. In fact, this knowledge is focused on raising the training status, upgrading fitness and efficiency of the shooter.

Circuit Training Features

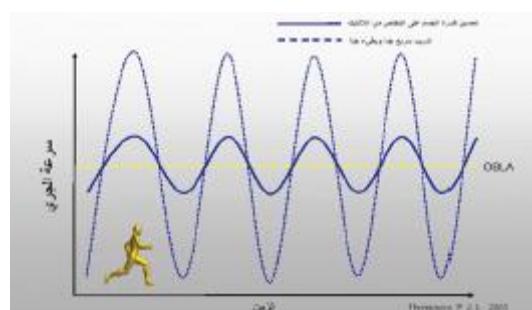
1. Improving the physical attributes such as strength speed, flexibility, endurance and its components of strength endurance, speed strength, and the technical skills and technical performance (technique).
2. A time-saving training method.

3. The load is to be graded correctly and objectively basis. By this method, we can notice the progress of each shooter and the process of raising the load must be more accurate and objective.
4. Everyone can exercise this training, taking individual differences into account.
5. The possibility of involving a large number of shooters at the same time, as it is easy to control the group during the training time.
6. Developing moral and volitional qualities such as regularity, honesty, and self-reliance.
7. Characterized by the thrill, change, and excitement factors.
8. The possibility of standardizing the training load (size, intensity, and rest) fully and easily control the use of the maximum ability.
9. The possibility of execution at any time and place even in indoors (halls) or outdoors.
10. Improving the efficiency of circulatory, respiratory, and nervous systems.

Fartlek Training (Target Sprint)

One of the training methods used in training, discovered in Sweden discovered by the Swedish Olympic coach, Gösta Holmér in 1930. 'Fartlek' is a Swedish word, have been translated into English by the same term, while translated into Arabic as 'speed play'. This method was used in training long-distance runners in Sweden and then spread throughout Europe and the world after having achieved the results and world records.

Using this system is easy, simple, and uncomplicated, as it is a freestyle method that has a special approach carried out according to the foreign sources. The performance of this type of training system, as Baron



mentioned according to Holmér, consists of continuous running (various forms of jogging and walking) for different distances, ranging from the short to medium and long, and varying intensity, between maximum, high, and medium, according to distance which is selected by the shooter himself, taking rest when needed. As Carden and Purdy suggest, this form of training includes running with speed and intensity. "This system aims to develop endurance capabilities and is a running process in which the speed and distances are varied," said Mohammed Osman (quoting Tess, Chenail, Booman). Moreover, Roy Benson pointed out that this type of training consists of a variety of periods of severe and simple running.

What Fartlek Develops

Since this method encompasses different distances, running intensity for a long time, it works on developing the endurance and speed at the same time, as performing for a long time develops endurance, while the different distances and intensity develop speed. "In fartlek, speed and endurance are developed at the same time and they are essential physical qualities," stated Connsilman. "Fartlek is a method to gain speed, endurance, and speed endurance," said Erie De Swardet. "It is better to apply this method in places where there are heights for the purpose of developing speed endurance, as well as strength endurance," recommended Holmér. "The heights condition sometimes is difficult to fulfill, so you can do some exercise of strength during the performance, especially jogging with jumping or barrier jumping so as to compensate for the heights and develop strength endurance," explained Shaker Mahmoud. Furthermore, strength endurance is to be developed during the general preparation.

Fartlek & Energy Systems

"When reviewing the performance of this method and the physical abilities it develops, we notice that it works on, as mentioned, developing endurance, speed, as well as strength endurance and all of these capabilities, combine aerobic and

anaerobic energy systems. Therefore, fartlek works on developing aerobic and anaerobic energy systems," confirmed Erie De Swardet. "This method combines anaerobic and aerobic capabilities and develops both, so it should be effectively used in the preparation and competition period for the development of both capabilities. Target Sprint employs both energy systems and fartlek suit this game and develops these energy systems," stressed Ahmed Mahmoud.

When to Use Fartlek

You can use this type of training in both stages, preparation, and competition, for developing endurance, speed, speed endurance, strength endurance, and preparing the shooter for the competition. Since this method helps to gain general endurance and speed endurance because of changes in pulse rate, respiration, and anaerobic and aerobic work exchange through the performance's pattern, which is between the maximum to average, it should be used during the preparation and competition stages for the mentioned. In addition, Erie De Swardet considered this method of general preparation methods for developing general endurance, speed endurance, and strength endurance, simultaneously.

Where to use fartlek

The critical characteristic of the fartlek method is that it can be used anywhere and does not necessitate to be used in the field, so you can apply it field, football playground, parks, forests, parking lots, or beaches, preferably, places where the heights exist. In the middle of this, the athlete will be away from his coach, which gives him high confidence to complement the training without any guidance. It also changes the regular pattern of daily training in the field by performing the training session in parks, forests or beaches of fresh air and scenic atmosphere, giving psychological comfort for the athlete.

Types of fartlek

Sources mention two types of fartlek:

- i. Holmér fartlek: It was named after the first discoverer of this Swedish method, Gösta Holmér. The format: Running different distances between the short, medium, and long, varying between maximum, high, and medium speed, as the shooter reaches fatigue stage and take rests, when feeling a certain level of tiredness, in the form of jogging or walking, following self-approach. That is placed by the shooter himself and according to the ability to determine the intensity and comfort as well as the distances. This kind can be performed anywhere, preferably, forests and beaches where there are heights.
- ii. Ledyard fartlek: It was named after, the coach of New Zealand, Ledyard, who devised this method at the early 1960s. This method is also called 'stable running' and is similar to continuous running. Its performance combines running on a fixed pace and rest intervals and is meant for developing general endurance. "Ledyard created other ascending or descending methods peppered with rest intervals," referred Erie De Sward.

Arab sources show another type of fartlek, which Shaker Mahmoud named 'the standardized method'. It depends on the pulse rate in determining the intensity by a program set by the coach. As he said, leaving this method as a freestyle method and giving the athlete the right to choose his training course may be inappropriate and the method may turn ineffective, especially if the athlete does not have the expertise and experience sufficient in the application of this method. Therefore, it is possible to make partial changes and identification, meeting the requirements of each event according to its distance, performance's intensity, and the need for aerobic and anaerobic capabilities, depending on the pulse rate index.

On this basis, this method can be used according to Holmér, when developing the speed endurance of the Target Sprint player according to the standardized method that meets the requirements of this game of constant performance, intensity,

maximum speed, and jogging. This is similar to the performance of Target Sprint, which features speed at the start point and then stopping and freezing during the shooting. For such, you may set a fartlek training method that includes short distances suiting the running distance and using the pulse rate index to control the intensity.

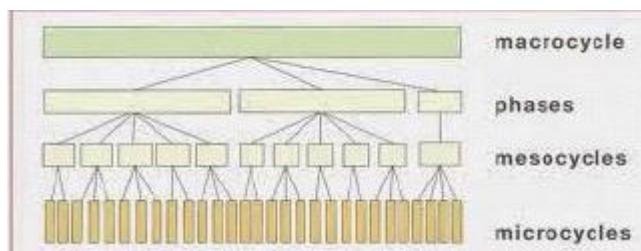
Chapter15

Planning

Sports Planning for Shooters

Introduction to Planning

Sports training planning is the shortest, most secure, and least expensive method to achieve athletic levels desired, according to the specific goals in various types of sports. Sports training planning are no less important than in other areas of life sciences, such as medicine, engineering, etc. Thus, generally, the planning process is a strategy based on quantitative and qualitative studies of the society taking into account the experience and what is available of technical capabilities and material potentials, which enables the achievement of goals. Planning represents a large and important base in the training process, as the growth and development of the performance of the player's level or team rely on precise scientific training programs. Therefore, a training plan is necessary actions identified and laid down by the trainer for developing the



training status (sports formation) of the player or team to reach the best level of performance during matches. Most administration scientists agree that planning is a future process and must be flexible and accurate. Flexibility is a must for the arising of any future, unexpected changes, while accuracy is to ensure the achievement of the goals. On that, the planning is a process, or processes, that includes forecasts and its precautions involving a series of decisions for the sake of the desired objectives employing policies, procedures, budgets and programs of accuracy and flexibility.

The Concept of Planning

A set of procedures executed in a particular order and is limited to a time. Therefore, planning is an ongoing and future process tends to have an integrated setup to reach the results and achievements targeted.

The Significance of Sports Planning:

Planning is of great significance in all areas of life, including sports training for the following points:

1. Setting goals.
2. Estimating the possibilities available.
3. Making operational procedures.
4. Taking full advantage of time.

Steps of Sports Training Planning:

1. Determine the long-term and short-term goals.
2. Determine the requirements that lead to the achievement of the goals.
3. Determine the procedures that put these requirements into effect.
4. Set a schedule for the implementation process.
5. Estimate and prepare the budget.

Types of Planning

Sports training is based, in terms of planning, on multiple types in which it is the basic feature of the planning. Types of planning:

- Long-term planning: Ranging between 8–15 years and is often applied for building juniors. The present system has become the main approach in most of the developed countries in order to prepare players for the Olympics, by two sessions or three, to guarantee that they acquired all experiences by which they can achieve Olympic medals.
- Competitions training planning: Ranging between 2–4 years, such as the Olympia, World Cup, continental championships, or regional tournaments preparations because of all of the mentioned need preparation long time due to its great international significance.
- Annual training planning: One of the phases of 'competitions training planning' and extends for a full year.
- Periodic training planning: Dividing the annual training plan to periods, containing two competitions, when planning for a local season or an overlap of two competitions at close times. This plan encompasses two peaks for the coach to keep track of the main plan of the shooter's level curve.
- Staging training planning: A plan divided into several stages for the sub-goals be easily achieved, which achieve periodic goals.
- Planning the training module: The basic unit for all sports training planning, as it addresses the activities and exercises of the sports training.

The training module is the basis of the daily planning process and is seen as the smallest unit in the organizational process of sports training and planning. However, it should include the following: Underlining the way and dose of the preparation, configuration, and warm-up processes. The order and sequence of

the main part exercises determine the training load (the volume, continuity of the exercises, its repetition, and rest intervals) and identify the most important educational points of the motor or planning skills.

Plan Stages

A training plan must go through several stages; therefore, the plan is divided into three fundamental periods:

- * Preparation period
- * Competition period
- * Transitional period

First: Preparation Period

This period can be divided into multiple stages, each aims at specific duties and objectives, and if must be divided into two stages, the following becomes the most important objectives of each stage:

1. General preparation period
2. Special preparation period

The first period of the preparation period the general preparation: This stage aims to work on the composition of the level of the shooter on a solid basis. The main contents:

General physical preparation: The stage aims at improving basic sports physical attributes generally such as muscle strength, speed, endurance, flexibility, and agility. In this stage, the efficiency of the unspecialized physical elements is increased, even though the shooter does not need it primarily, the physiological efficiency of the player must be ready, in general.

Skill preparation: Expanding the technical skills of the shooter's capabilities by education and trying to master the various shooting's techniques.

Moral and volitional preparation: Boosting cognitive and volitional traits upon which the violent work is based in the following stages, such as patience,

endurance, and commitment. This stage is all about modifying the behavior of the shooter to pave the way for the rest of the plan. The coach must take into account grading and progress in relation to the volume and intensity of the training load.

Second: Special Preparation Period

The preparation period: This phase attempts making the shooter reach the maximum level; the following material forms the most important training contents:

Special physical preparation: It is the most important in this period, thus the overall volume of the general physical preparation diminishes and the shooter begins to work and develop the special physical elements dramatically.

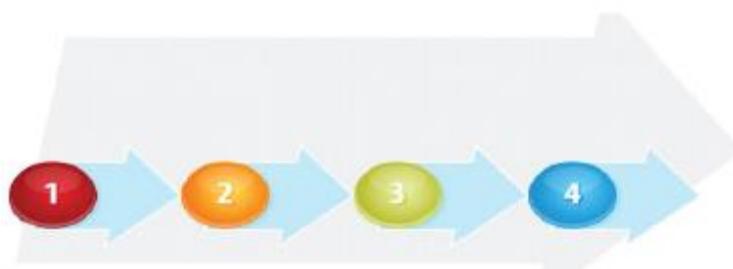
Skill preparation: The coach begins by focusing heavily on the basics of shooting, which is the base of the performance, e.g. position, aiming rule, pulling, following-up.

Planning Preparation:

The acquisition and mastery of various planning abilities and skills to manage games. moral and volitional preparation: The focus is on the development of the volitional and congenital characteristics and features the success demand in competitions.

Participating in Competitions:

Competitions at this stage are about training and grading because it prepares the shooter for more important competitions within the next training period. So, the shooter is to experience the performance, he gained in this period under different conditions, measure the efficiency, and identify the weaknesses and strengths of performance for a period before the match to allow



him and his coach to resolve any problem. It is noted that this stage concerns only about shooting so we can call it the stage of special preparation.

The coach must try to make the shooter achieve almost the maximum level at the end of this period. Therefore, the contents of the preparation period must be continued if the shooter did not reach the required level until the beginning of the competition. Accordingly, the preparation period is not finished until guaranteeing that the shooter reached nearly the maximum level.

Competition Period

This period is meant for working on the prevention and maintenance of the level reached by the shooter, through creating different conditions that allow retaining the skills, abilities, and attributes acquired and trying to advance them to the maximum level. This period is also divided into:

1) Pre-competition period

In this period, the shooter is to train and focus on the planning aspect considerably to increase the ability to deal with emergencies and manage the match well without performance being affected. Here, he is to work most on the planning aspect that is insurance of the performance.

2) Competition period

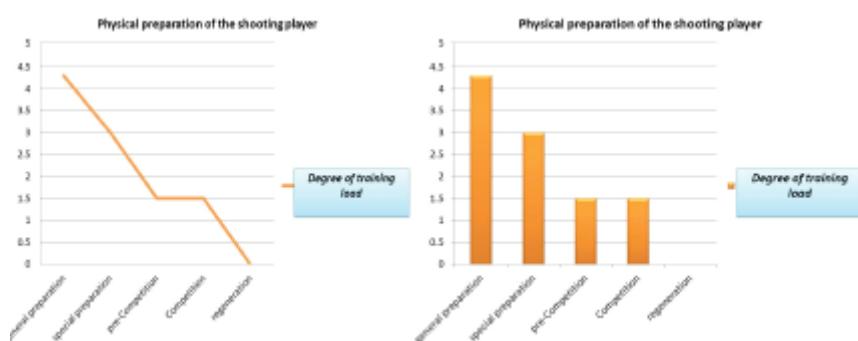
It is characterized by not learning a lot of new subjects, as the shooter attempts to use and apply everything acquired during the period of preparation. Of course, it comes upon the participation of the competition, as it plays an important role in improving the training status, i.e. developing of the physical characteristics and features, volitional, physical and technical skills, as well as abilities of planning.

Aspects of the Training Plan

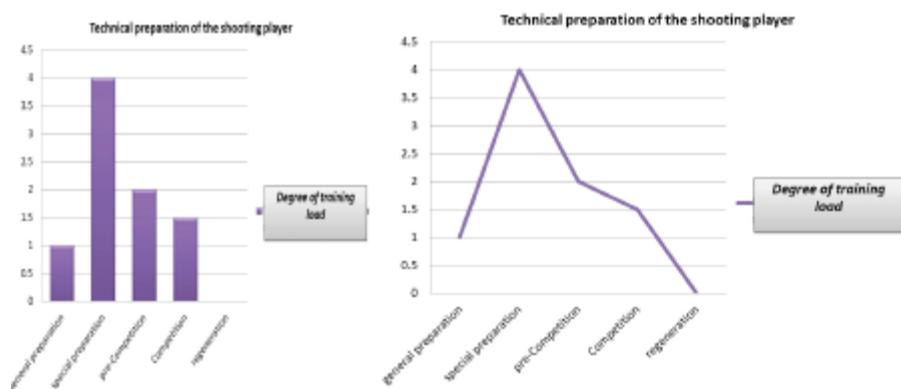
The training plan includes several aspects the shooter is to work on and develop to improve the performance:

First: Physical aspect

The foundation stone upon which other aspects are built, because increasing the physical side efficiency of the shooter may facilitate developing the other aspects in order to increase the physiological efficiency of the shooter during the implementation of the performance in which fitness elements are widely used. This aspect must be worked on in the general and special preparation primarily and highly more than the periods of competition to increase the physical efficiency of the shooter, muscles' recovery, and muscles' ability to take appropriate shooting positions. In the following figure, we show degrees of physical load during the training season.



Second: Technical aspect



The technical points, i.e. pulling, aiming, position, stability, etc. that include learning or improving the technical skills of performance through special training, which is primarily in your preparation to make sure to increase the efficiency as well as technical points.

Third: Psychological aspect

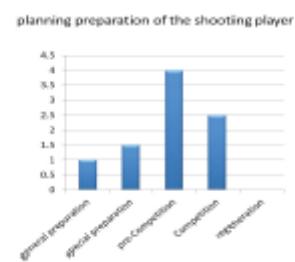
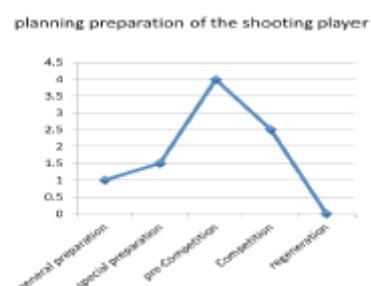
It includes the basic psychological elements of the shooter that must be worked on (such as focus, self-confidence, reaction speed, determination, etc.) Moreover, the coach identifies all influential elements of the shooter according to the type of activity he practices in the sport of shooting. Through coordinating with the psychologist and applying specific training programs for shooters, they will be able to increase the psychological aspect and focus on it greatly in competitions to find solutions for sudden problems that may be the turning point. Accordingly, the psychological aspect should be used significantly. The following figure shows us the degrees of the psychological aspect load in the training plan.

Fourth: Cognitive aspect

The side that is concerned with expanding the knowledge of shooters and increase their culture in their sport via lectures acquire information and experiences by specialists for example lectures on (steroids, modifications in the game law, the significance of nutrition in sports, etc.).

Fifth: The planning aspect

The planning aspect of the shooter is supportive of performance in competitions and can make the performance excellent, overcoming all drawbacks that can affect the performance significantly. The trainer's role is to set training plans for each shooter, according to his performance requirements, e.g. organizing rests, performance, the shot's plan, etc. Moreover, the focus is to be on the pre-competition planning aspect in order to give the shooter sufficient time for memorizing the plan. The following figure

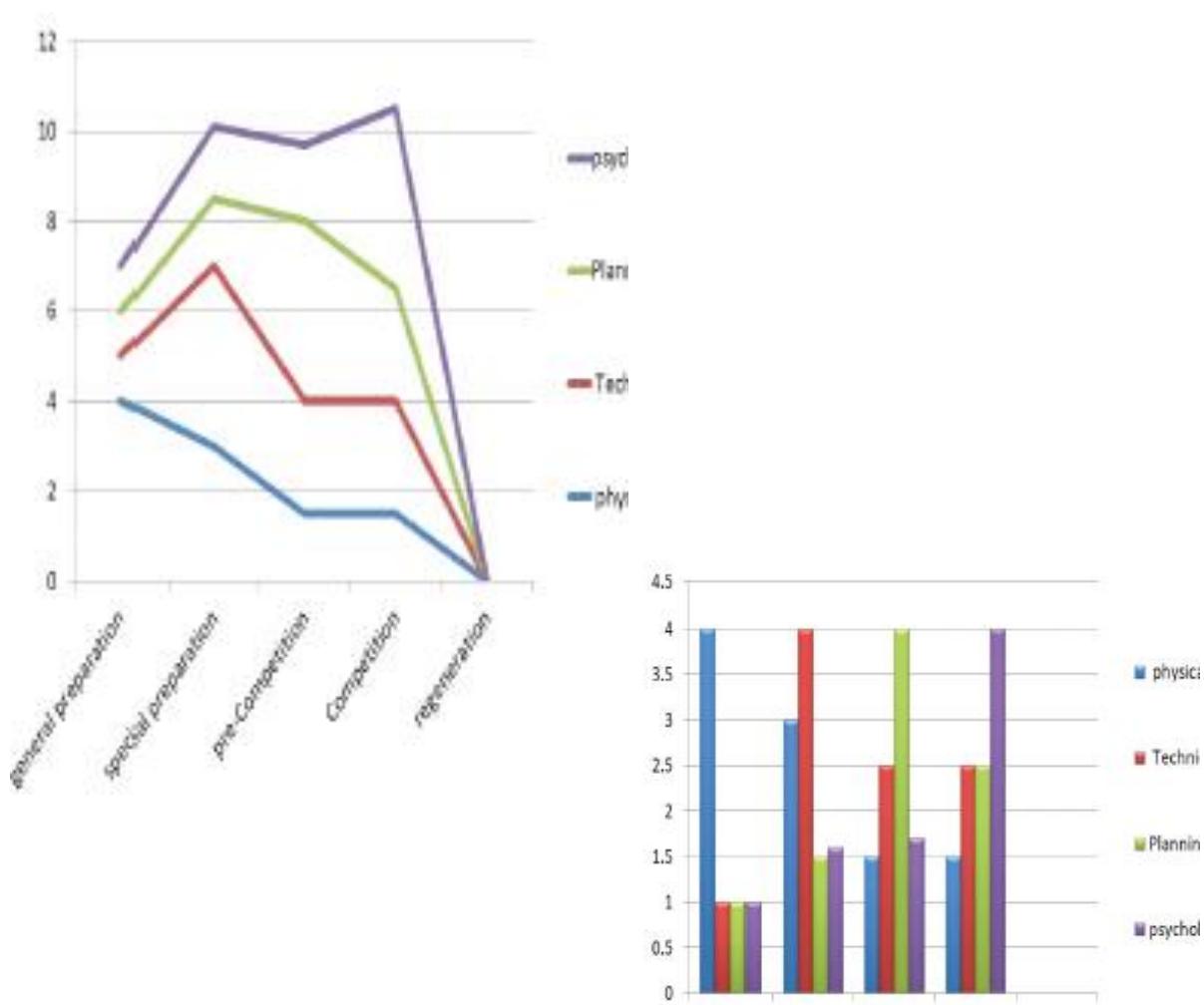


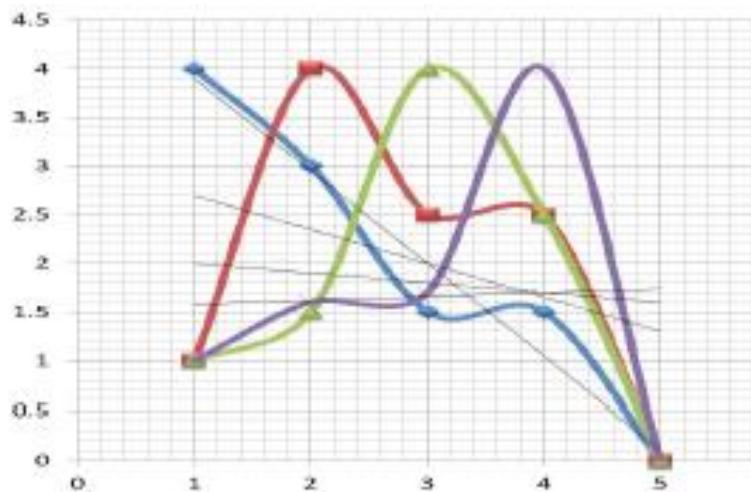
explains the levels of the training load's planning in the training plan's period.

Sixth: Tests and measurements

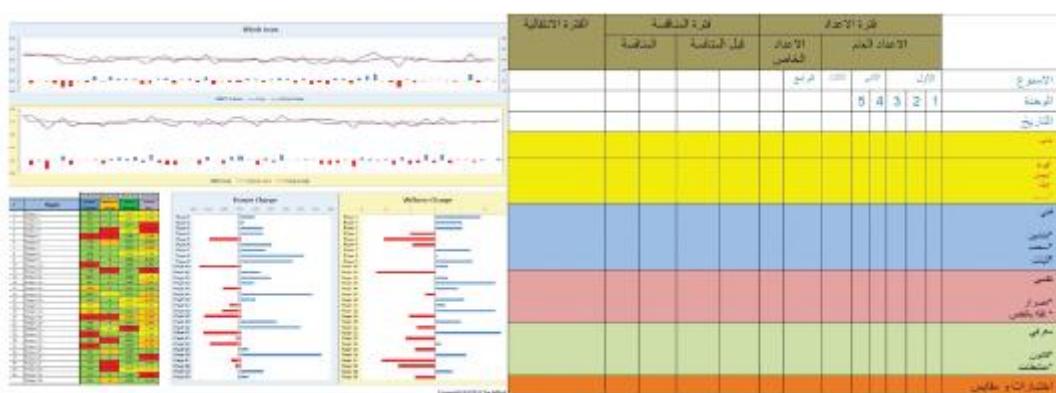
The most important aspect of the training plan, which the plan success depends on and is at the beginning of the training plan. The specialized trainers should conduct tests and measurements for the shooters and underline their current level to begin the training plan. At the end of the plan, they should conduct it again to spot the development.

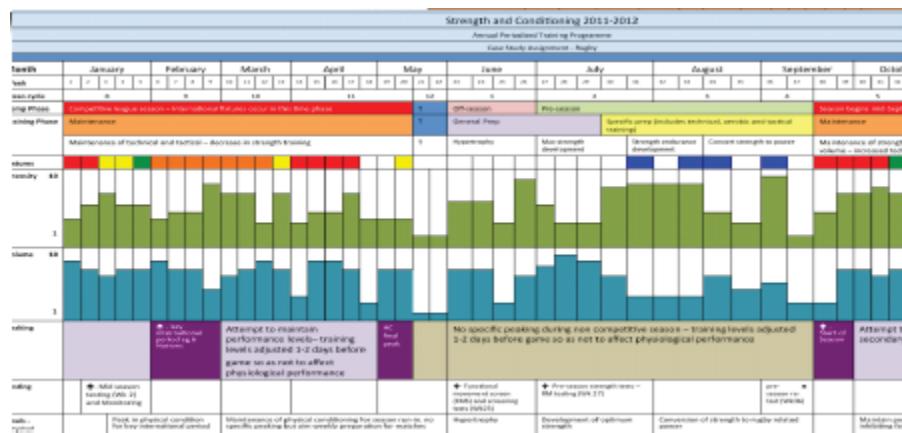
In the following figure, we will present the general form of the training plan, how to standardize and distribute the training load's components, and will offer some forms of training plans according to the training plan periods.





| Strength and Conditioning 2012/2013 | | | | | | | | | | | | | | |
|--|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Annual Periodization Training Programme for SOCCER Case Study Assessment | | | | | | | | | | | | | | |
| PROGRAMME | AUG | | SEPT | | OCT | | NOV | | DEC | | JAN | | FEB | |
| | MON | TUE | WED | THU | FRI | SAT | SUN | MON | TUE | WED | THU | FRI | SAT | SUN |
| Weeks | | | | | | | | | | | | | | |
| 1 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 2 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 3 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 4 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 5 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| COMPLETED ON PHASE | | | | | | | | | | | | | | |
| OFF SEASON (WEEKS) | | | | | | | | | | | | | | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 | | | | | | | | | | | | | | |
| EARLY SEASON (WEEKS) | | | | | | | | | | | | | | |
| 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 | | | | | | | | | | | | | | |
| LITERATURE | | | | | | | | | | | | | | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 | | | | | | | | | | | | | | |
| MATERIAL | | | | | | | | | | | | | | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 | | | | | | | | | | | | | | |
| GOALS | | | | | | | | | | | | | | |
| Physical | | | | | | | | | | | | | | |
| MAINTENANCE OF PRE SEASON (WEEKS) ENSURE A DEQUATE RECOVERY TO PREVENT OVERTRAINING AND OVERREACHING | | | | | | | | | | | | | | |
| Technical | | | | | | | | | | | | | | |
| GENERAL SKILL AND ENHANCE TRAINING TECHNIQUE (PASSING, TACKLING, SHOOTING, HEADING, RESISTANCE, AGILITY AND PYOMETRIC TECHNIQUE) | | | | | | | | | | | | | | |
| Tactical | | | | | | | | | | | | | | |
| OPPONENT RELATED TACTICS (FORMATION, PHASES OF PLAY, GAME/PLAYER STRATEGIES AND SET PIECES) | | | | | | | | | | | | | | |
| Mental | | | | | | | | | | | | | | |
| PERFORMANCE GOALS, RELAX & COPE WITH PRESSURE | | | | | | | | | | | | | | |





Training Module

We can define the daily training module as the smallest unit or part of the training process and forms the basis of the structuring and planning of the training. Thus, trainers are required to focus on the daily training module in terms of components and contents that are the basis of the athlete's development. The training module should contain physical, skill, psychological, educational, and social aspects. In addition, giving importance and priority to the training module prepares the athlete in all aspects.

Therefore, the training module is the cornerstone of the full planning of the main load cycle or sports training season. The successful preparation and formation of the training load during training is the basis of successful planning of the full season. This requires considering many demands such as how to form the training module, its main objectives, standardizing its different loads, and knowing the types of training modules and their physiological effects. Not to mention the need for knowing how to coordinate between the order of these different units during the training day, as well as the small cycle of load or the training week until the end of the training season.

The Main Components of the Training Modules

The main components of the training module depend on several factors:

1. Objectives and duties.

2. The type of physiological changes associated with the effect of forming the training module contents.
3. The size of the training loads of the training module.
4. Specifying the exercises used in the module.
5. The work and rest system of the training module.

According to the factors mentioned above, the module can be divided into three basic parts: Introductory, basic, and final.

i. The Introductory Part (Warm-up)

This part represents the beginning of the training module and its main objectives are preparing the shooter for the application and implementation of the basic part. In this part, the warm-up process is done and its physiological benefits are all about recovery. The benefits are as follows:

- a) Increasing the metabolic rate by 7%; the body's temperature by a half degree. Therefore, it reduces the oxygen intake due to shortening the required time to reach the fixed state (during the performance), and the speed of synchronizing (between physiological processes and performance requirements). This utterly reduces fatigue and its symptoms and provides a better opportunity for recovery operations to minimize the residues of anaerobic energy production.
- b) Increasing the speed of oxygen and food access to the tissues, which facilitates metabolism.
- c) Increasing the speed of muscle contraction and relaxation, which reduces the chances of injuries.
- d) Reducing muscle viscosity to prevent muscle strains.
- e) Protecting the heart muscle from a sudden effort that can lead to serious health complications.

Typically, warming up is two types: general and special.

General Warm-up

It aims to activate vital physiological systems such as the central nervous, the motor, and the autonomic nervous systems. So, physical exercises are used to increase the general physical fitness of the body.



Special Warm-up

It is used to put the central nervous system and the peripheral nervous system in the best condition, enabling it to perform effectively in the main part of the training module as well as to stimulate the involuntary physiological functions necessary for the requirements of body's activity.

The duration of the warm-up depends on several factors related to the individual differences, the quality, and nature of the athletic performance, and the external conditions. For example, we notice differences between athletes in relation to their needs for the long or short warm-ups.

Warming-up for speed events differs from warming up for endurance events, not to mention that warming up in hot weather takes less time than in cold weather.

ii. The Basic Part

It aims to achieve the main objective of the training module; therefore, the exercises vary according to the objectives of training sessions, which can be related to raising the level of physical and psychological preparation as well as the development of skill and planning level. The most important factors for planning this part:

- Arranging exercises according to the level of intensity to allow the execution of the rippling form that shows an increase followed by a decrease, allowing recovery operations to function to meet the increase in intensity.

- Benefiting from the standardizing rest periods in order to achieve their objectives to restore recovery and achieve the desired effect.
- Varying the use of muscle groups to change the focus to allow more rest period for the working groups.
- Changing between the fast-anaerobic work and the slow aerodynamic work, so that sources of anaerobic energy production can take some time to recover during the work—without stopping training to complete the recovery process.
- Benefiting from the active rest and negative rest style during periods between training sets using flexibility, rubber and swing exercises, especially in the case of weightlifting training.

Factors of the Basic Part Duration

The time of the basic part depends on several factors:

1. Methods and quality of practicing exercises.
2. Exercises' volume.
3. The exercises and their number.
4. The ability to use high and low levels of intensity.

iii. The Final Part

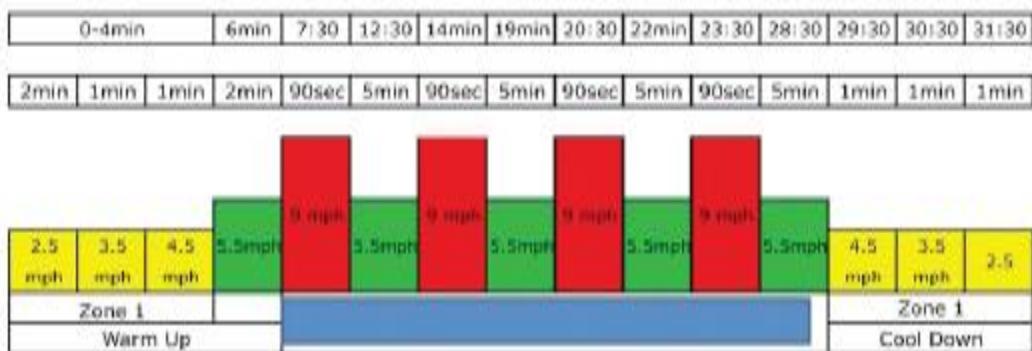
During this part, the training load is diminished regularly to make the shooter in the same condition the training module or at least close to it. That also helps recovery operations to achieve its objectives. Therefore, this part should not be neglected for the following benefits:

- a) Reducing the time required to remove lactic acid that causes muscle fatigue.
- b) Clearing the muscle fibers from the remnants of muscle work and minor cuts that occurred during the training session.
- c) Calming the nervous system after being stimulated during the training.

d) Returning the body to its natural state

Training Module Figures

| الاحداث | الملحوظة | التمرين | مكونات العمل | | | | المكان | الزمن | الاجراء |
|------------------------|----------|---|--------------|----------|-------|---------|---------|-------|----------------|
| | | | الجسم | المكانية | الشدة | المقدار | | | |
| قياس متوسط الـ 40 مللة | السباحة | اصمام | - | - | - | - | الميدان | د 10 | الجزء التمهيدي |
| السبك | البلديه | حجم الثبات - اطول زم من يمكن تحمل العزم - مرحلة الثبات - الجسم الالاف و الراس | ٤ اختبار | د ٨ | % 100 | | الميدان | د ١٥٠ | الجزء الرئيسي |
| - | - | تجويف | - | - | - | - | الميدان | د ١٠ | الجزء الختامي |



Chapter16

Measuring the Training Loads

The Concept of Training Load

If the athlete performs an exercise, whether a physical, skill, or planning, this performance will affect functional organs of his body in a certain way. For example, some effects occur in the muscular system, as the degree of muscle tension increases (contracture) to a degree commensurate with the intensity of the performance of the exercise. At the same time, the pulse rate increases, and the nervous system alerts increases to commensurate the intensity of the performance and so on. Any physical, motor, exercise, or skill exercise performed by the athlete leads to anatomical, physiological, chemical, and psychological changes within his body. The effectiveness of such physical activity is because of the working period of his performance, distance, repetition (volume), quality, speed (intensity), and the continuity of the performance (density). Not to mention that the degree of the effects is directly proportional to the functional systems as well as the intensity of exercise. The heavy physical exercise or physical load on organs is the main means of influencing the shooter and leads to improving the level of the functional and organic of systems as well as the organs of the body,



thus, the development of physical qualities and skills, motor, planning abilities, psychological and voluntary features via exercises, actions, and sports movements as well as various sports machines and tools. But one should take into account the rest intervals between every two exercises or sets, movements, activities using modern methods, and a variety of methods.

Definitions of Training Load

It is defined as the effect of training on the functional and psychological state of the individual, or the amount of influence on organs and systems while practicing physical activity. It is also known as the number of effects on internal organs as a result of specific muscle function and is reflected in internal organs as a functional reaction. Moreover, it is the fundamental basis of sports training in both the theoretical and practical fields.

It is all activities and actions carried out by the human being, whether physical or motor, which makes the body exerts an extra effort, leading to physical, physiological, and chemical changes.

Matveev (1981) believes that the training load is the amount of physical and psychological impact, and effort, on organs as a reaction to physical activity.

The Significance of the Training Load

1. An effective way of affecting the shooter because of the functional and external changes in the body organs.
2. Increases the effectiveness of motor coordination with the adaption of systems, and grows capabilities.
3. Improves the level of the shooter when using the correct scientific basis commensurate with the efficiency for achieving the goal.



Types (forms) of Training Load

- * External load.
 - * Internal load.
 - * Physiological load.
- A. External load
1. A load that occurs through the effects of load components (size, intensity, comfort, density).
 2. Or, it is a set of exercises performed by a shooter, causing reactions in the physical and psychological aspects.
 3. It also means that all exercises performed by shooters are to develop physical qualities, aspects of skills, and planning capabilities.

The external load physical workouts to give doses aimed at training during the training curriculum and we mean) the degree of organic response that arises because of the burden of Damocles has several components and its impact is limited to the construction of the muscular body process.

Factors of External Load

1. The psychological and physical status of the shooter.
2. The sports equipment's condition.
3. The climatic conditions (heat, wind, atmospheric pressure, humidity, rain, coolness).
4. The height of the training area.
5. The shooter's response to the training load
6. Social relations.
7. Nutrition.
8. The shooter's opinion of the load method.



B. Internal load

It expresses the effect of internal load, resulting from the external load, on the functional organs of the body and mental load of the shooter. Also known as:

All functional and chemical variables in organs and systems the is under the effect of the external load. Alternatively, the level of internal, biological, functional changes in the body organs as a result of the performance of different types of exercises.

The internal load is because of the performance of the external load training during daily sessions of the training course, as it represents the degree of response and functional changes caused by external load on body organs. The effect of the external load is directly proportional to the internal load of the shooter's body. Basically, the greater the external load the more functional and chemical changes occur in the various organs of the body as well as the amount of psychological stress. The greater the changes in the vital organs of the body the higher the external load.

C. Psychological load

For improving the physical, skill, and planning aspects of the shooter, take into consideration the psychological aspects, as it is close to the means of development and formation of others, especially, the excitement, tension, and psychological pressures during competitions. That leads to some physiological changes, so the psychological aspect represents the nerve pressures faced by the shooter during training and competition to achieve a goal. These pressures include the public; the responsibility of the game, its sensitivity; and the impact of the result on the whole team. All of that generate psychological pressures when associated with winning or losing.

Training Load Components:

It consists of four main components, as follows:

- * Intensity
- * Load volume (capacity).
- * Rest
- * Density
- * intensity

The degree of neural muscular effort the shooter exerts during the performance of each exercise, movement, or action at a specific time. For example, the performance of 10-shot set at a specified time. The less time, the more the intensity on the player, as he has to shoot the set in a short time with the best result. On the contrary, the more the time the less the intensity on the player in terms of set's performance, as he performs comfortably.

It is the degree of fatigue, resulting from the training session and its concentration in the time unit of time. For example, the speed of running represents the intensity component in Target Sprint. In running training, the intensity gets higher as the running of speed increases. Thus, the faster the performance timing gets as the more intensity will be. In weightlifting exercises, the more the weight is, the higher the intensity gets. Accordingly, we can say that the intensity rises if the shots number is increased in the performance. The measurement units used to determine the severity are as follows:

- a. Time: in seconds or minutes.
- b. The degree resistance strength: Number of shots for each player.
- c. Performance score: Results of correct shots or hit in the shotgun and Target Sprint.
- d. The timing of the performance (speed or slow play): A certain time for shooting the shots
- e. Pulse: it is measured during the maximum performance and rest intervals, and often used in Target Sprint.

Intensity Divisions

There are several divisions of intensity, including the following:

| Harrah (German expert) | Matveev (Russian scientist) |
|--------------------------------|--|
| (30-50%) simple or low | (30-50%) Low intensity |
| (50-70%) less than the average | (50-70%) simple intensity |
| (70-80%) average | (70-80%) medium intensity |
| (80-90%) below the maximum | (80-90%) less than the maximum intensity |
| (90-100%) maximum | (90-100%) maximum intensity |
| (100-105%) above the maximum | |

Methods of Measuring the Intensity

There are several ways to measure intensity:

a) Time

It is the trainer's knowledge of the best result of the shooter during a specific time.

Amount of work required (intensity) = Minimum time of the shooter $\times 100 / \text{selected intensity (\%)}^*$

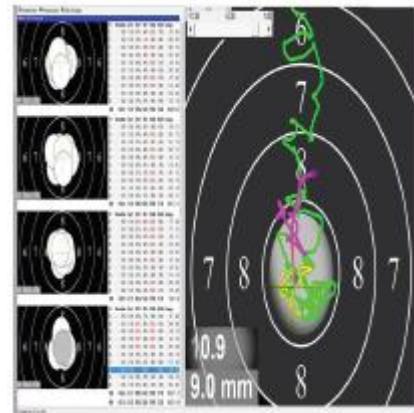
b) Resistance (shots)

For strength exercises using a number of shots, the intensity of performing a strength exercise is measured by noticing the maximum number in each exercise per one time.

The number of shots at a certain intensity =

c) Performance result

For shooting events, the intensity is measured via recognizing the shooter's level and ordering the targets according to the hardness.



d) Pulse calculation (Target Sprint)

The intensity is measured by pulse; Target Sprint players usually adopt this method.

There are many ways to measure intensity via pulse, such as:

I. Maximum pulse rate method

This method uses the pulse rate during the exercise as proof of the required load's intensity.

Notably, one variable by which the intensity is measured is the maximum rate of pulse. For example:

Assuming that the maximum pulse rate of the shooter (male/female) is 195 pulses/minute during the physical effort and we want to add a load of 70% of the maximum.

The targeted pulse rate of the intensity of 70% = $70/100 \times 195 = 137$ pulse /min.

Therefore, the exercise's load intensity of this player that equals 70% must increase the pulse rate to 137 pulses per minutes.

II. Sports age method

Measuring the intensity by the pulse rate is based on the age of shooting in years, and according to the following equation:

Fixed number (220) - age of shooting (years) = the maximum pulse rate

The number of pulses × the required intensity = the average

We can measure the intensity by extracting the percentage of the maximum pulse rate.

A 20-year-old player trains by an intensity of 80% according to that, what is his pulse rate, when he trains by this intensity?

$220 - 20 = 200$ pulse/minute (This is the maximum pulse rate)



Load Volume (capacity)

It is a component of the main training load, while the volume of the load is the distances, times, or amount of weight the shooter faces during a specified period (day, week, month, or year), i.e. the amount and quantity of the program elements in each training module. The volume of the load represents the number of repetitions in one exercise as well as the repetition of the exercise. Additionally, it is the total number of repetitions in the training module besides the duration of the stimulant. In the following figure, we clarify the relation between intensity and volume. It consists of two components:

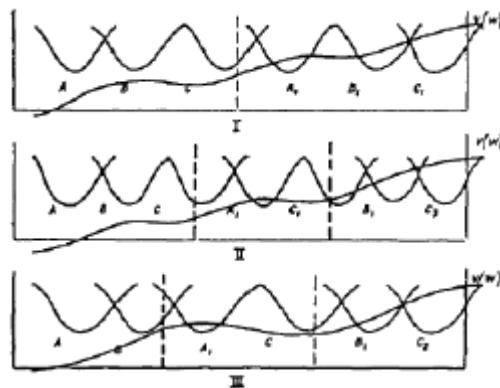


FIG. 8: The structural variations of a training year (Verhoshansky 1991) (V=speed, w=performance = intensity of the movement, A,B,C.=blocks



The first component: The reps in the exercise or its time.

The second component: The number of performing the exercise or the total time spent in performance.

How to Determine the Volume of the Load

Assuming that the trainer set 4 times as the exercise's repetition, so the shooter performs the exercise 15 times in 30 seconds for another 3 times. Consequently, the performance number of exercises is 4 times, which is the second component. As the exercise does not require the same number of repeating every time, we form the following equation to determine the volume of the load:

The volume of the load = the reps of the exercise or the duration for the first time + the reps of the exercise or the duration for the second time + the reps of the exercise or the duration for the third time, etc.

When applying the previous equation, remember that it could be the reps, performance time, distance, or weight used in performance. We left it open and unlimited after performance repetitions. The volume of the stimulant is determined by the following:

- The strength of each stimulant.
- The speed of performing movements and exercises.
- The duration and repetitions of each exercise or movement in each training module.
- The duration and repetitions of each set of exercises or movements in each training module.

Example: If the shooter performed a training module to develop (pulling)

$$5 \times 10 \text{ reps} = 50 \text{ reps}$$

$$7 \times 10 \text{ rep} = 70 \text{ reps}$$

$$\text{The total volume} = 50 + 70 = 120 \text{ reps}$$

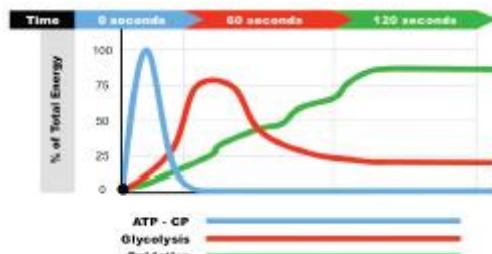
If you want to calculate the weekly training volume, do the following:

If the number of performed modules is four, for example, the result will be = Volume per day:

The first + in the second day + in the third day + in the fourth day...

Rest

One of the main training load components and is the time relationship between two load periods or repetition and another of the same exercise. In fact, regulating the relation between load and rest is important to make the player reaches to his normal state (recovery) to ensure his ability to continue the performance and add more training load. Sometimes, the training can be performed without rest, such as in continuous load method and it has an important role in the response and adaptation of functional organs. Thus, it requires providing specific rest intervals,



whether, between repetitions or sets; this part is related to the intensity and type of exercise, and the period of rest is determined according to the intensity and volume of load. The rest intervals are determined according to the intensity and volume of load. As a general principle, the shooter should be able to repeat the exercise normally after the rest period finishes. Scientists believe that the appropriate rest intervals between each training are those that allow the recovering of the functional organs and returning to a normal state. Accordingly, rest is 'the period between work and rest, whether between two exercises or sets, depending on the intensity of the stimulant, and its continuity'.

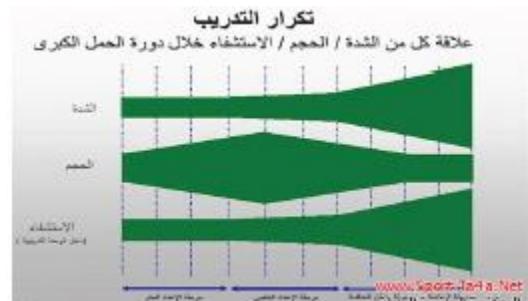
The rest period is divided into two main types:

- i. Negative Rest: A complete rest in which the shooter does not perform any type of training or practicing. Moreover, this type decreases the shooter's level when used randomly apart from the training plan. However, when putting the negative rest within the training plan, it is certainly useful and restores the recovery of the body organs as well as their readiness to carry out another activity in the next training modules.

Examples of negative rest: Standing without movement, sitting, or lying down during the exercise.

- ii. Positive rest (active): A rest in which the shooter performs a certain type of activities in a certain way that contributes to restoring the ability to perform another sports activity or some exercises of little intensity between every two exercises or sets. For example, performing some flexibility and relaxation exercises after heavy strength exercises, shooting in a sitting position, or while eyes are closed, etc.

The levels of rest are divided into two types:



- A. Complete rest: In this type, the physiological processes of the body drop to low rates and the shooter reaches his normal state.
- B. Incomplete rest: The shooter reaches an incomplete or normal rest, in this kind of rest.

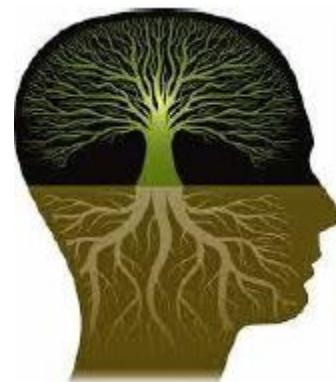
Density

The length or shortness of rest intervals between the repetitions of an effort (load).

The previous definition reflects the time relation between repetitions of an effort (exercises that constitute load) and it expresses this relationship between the performance and its different stages by time, as appropriate intensity guarantees the following:

- I. Training should be effective.
- II. Prevents reaching fatigue.

It is the time relation between load and rest intervals during a single training module. This relation is especially important for ensuring that the body organs and systems return to their normal state (recovery) after physical effort. Thus, the shooter will be able to continue adding more loads of training with the ability to work and perform. The two load durations mentioned, are (the intensity of a single exercise \times the repetitions of the exercise), i.e. (the intensity and volume) for a single exercise or the set of exercises performed during a training module. The length or shortness of the rest period is to be in proportion with intensity and load volume that it allows the shooter, after finishing the rest period, to be in his normal state, allowing him to repeat one exercise or set of one training module well. In addition, the intensity of the load and volume determine the nature and form of rest intervals between different



repetitions. Thus, the rest intervals can be positive by performing some activities in a certain way that does not increase fatigue, allowing fast recovery, by performing any physical activity.

The intensity of the training load is derived from the following equation:

The intensity of the load = volume of load/time of exercise performance + rest time.

The Significance of Density

1. The basic component of accomplishing the training module's objective.
2. A way of comparing two training modules or more.
3. It gives a physiological indication of the training module strength.



Features of Training Load

The training load depends on some foundations, which we define by the following:

1. Training load is one of the basic means to increase the ability of the shooter.
2. Considers individual differences by using the training load's components.
3. Developing the training load is via using the components to that suit the level of the shooter in relation to the training module.
4. It is not acceptable to keep on the training load before finishing the recovery period.

The Relation between External and Internal Load

Both the external and internal load are linked. So, any increase in the external load or its intensity leads to an increase in the effect on the functional state of the body organs and increasing fatigue. However, this relation between the external and internal load appears within certain limits, i.e. the internal physiological changes

differ according to many factors. For example, if the training load intensity is between 90-95% of the shooter's maximum intensity, it could lead to different internal effects if the rest intervals are varied. In the case of a short rest period of 10–15 Second, the recovery period is not completed. On the contrary, if the rest period is between 1–2 minutes, the recovery operations take enough time to prepare the shooter for better repetitive performance. This depends on the ability of the shooter to withstand internal load on his vital organs. Fatigue also effects on the technical performance by increasing the internal load, even though the external load's components are not changed. The internal load is affected by the level of the shooter as well as his training status; its impact increases if the shooter is well-trained more than if the shooter is poorly. It may also be reduced if the shooter continued training for a long time and in the middle of the adjustment process.

Assessing the Training Load

An important stage in training planning and implementing and uses two methods:

1. Objective method: Assessing the load by using scientific instruments. It is more accurate, as it employs devices in tests and analyses, even though it is still difficult to use in a broad range of different types of sports.
2. Evaluative method: There are two ways of this method:
 - a) Assessing the load before implementation: It is most common in training programs planning methods and relies on:
 - The trainer's experience.
 - Studying and analyzing the capabilities of the shooters.
 - Using cumulative training records.
 - Comparing the loads with its identical in scientific references and programs.
 - b) Assessing the load during and after the shooter's application:
The coach uses subjective notes through a form, like the following:

- 1) Physiological indicators: Skin color, breathing, heartbeat rate per minute, etc.
- 2) Psychological indicators: Facial expressions, spontaneous words, general focus, etc.
- 3) Technical performance in general.

Chapter 17

Nutrition

Nutrition in Shooting Sport

Introduction:

Nutrition is the basic resource of energy for the athlete, which helps him to move, as his body cannot keep on playing for a long time. In many sports require a lot of effort for a period of time, the athlete is to offer a good show and harmonized rhythm, causing awesome performance, but if the athlete did not adjust his nutrition, he will be in hard position without the energy to make effort. Therefore, if his nutrition has any problem, the outcome will be weak and won't be able to keep exerting effort. Nutrition is of great importance as it cannot be separated from training in terms of significance in the athlete's life. thus, it is an integrated system that its components cannot be separated. nutrition, training, and rest complement each other and without them, it is difficult to improve the athlete's level, nutrition is 60% of the athlete's life and its effects appear on the individual player more than team players. That is due to entering competitions alone and without receiving any help from colleagues, and therefore, he cannot be replaced. Such is not the case with team sports, as judging the performance is according to the collective performance of the team. When



each player shows high performance, as we see in Europe, the performance becomes great. On the contrary, sometimes, the performance maybe average or boring when half of the group perform well while the other half is walking in the stadium. In this case, the quality becomes bad and the performance becomes normal as if you follow a neighborhoods match. Nutrition of athletes differs from the normal person's nutrition because the former exerts an effort in training, consuming all the energy stored in his body, which is compensated by balanced nutrition.

The Effect of Food on Athletic Performance

We should know that the method of preparation, training, skill acquisition, mastering the technical and planning aspects, and repeated competitions are the key factors that pave the way for the championship before anything else.

Some foods may affect muscle performance by:

- Renewing energy sources.
- Facilitating chemical reactions that generate energy in the body.
- Overcoming the interactions that lead to muscle fatigue.
- Decreasing the extra fat of the body, which increases the ability of the body to move.

The Importance of Food for Athletes

Food provides the athlete with all essential nutrients: vitamins, fats, carbohydrates, and minerals. The amount of food needed by the athlete varies depending on the effort he makes during performing the exercise, i.e. the amount of food needed by the athlete increases by as the effort increases and vice versa. Food provides the athlete with the necessary energy for moving and doing a muscular and mental activity. Eating one gram of protein provides the athlete with



about 4 calories while 1 gram of fat, provides him with 9 calories and one gram of carbohydrate also provides 4 calories, it is recommended for athletes to increase the proteins about 10-15% of the total daily energy needs, fat about 25%, and carbohydrates about 60%. It has been lately found that excessive intake of proteins, more than the recommended amount, does not benefit the body and constitute a load and stress on the kidneys, while excessive intake of fats and carbohydrates is stored in the body in a form of fatty tissues, which increase the weight and decrease the movement of the body. A balanced diet is an essential tool to improve the fitness of the athlete and increase the rate of endurance—not tonics, drugs, or steroids as many believe.



The Number of Calories for the Shooter

The number of calories consumed to maintain body weight during the normal daily activity ranges between 1700–3000 calories for young people while it is less for adults.

The athlete needs between 4000-6000 calories per day to maintain weight during training; this quantity depends on the quality of the exercise and competition. Speed and field players need a small number of calories compared to running players (target sprint).

Basic Principles of Nutrition for the Shooter

Food and metabolism feature, required by muscular performance, often determine the adapting process development of the athletes' body during the games or training. The food factor can have a positive and active effect on the metabolism of the body. To achieve the ideal nutrition for shooters, many principles must be taken into account, according to nutrition science. The most important principles are as follow:

Adopting balanced diet, taking into account the consumed quantity and type of food in relation to training needs or competitions, and not to increase the amount of protein, carbohydrates, fat, or take additional doses of vitamins or minerals more than the requirements of the shooters, without consulting nutrition specialists. Remember that the amount of food associated with these elements should not be less than training and competition needs, because of the difficulties that may affect the health status of the shooters.

Applying the taste principle on food, without spoiling the food balance, because giving attention to such principle alone cannot achieve the ideal nutrition. Eating many foods that suit the shooters' appetite may cause some problems that affect their health and have a negative impact on the performance level. Therefore, they should pay attention to the nutritional balance and taste principle to preserve health and healthy mental state as well, which is very much affected by preventing them from eating foods they tend to eat in their nutrition.

Taking into account the ratios prescribed for basic components of shooters' meals, which must be compatible with many variables, among the most important are:

1. The activity nature and the physical effort exerted in the training or competitions, according to the scientific principles of training and the playing rules.
2. Age and gender. The shooter's needs for food are age-related and are related to gender (male or female shooters).
3. The health status of the shooters, since, the proportions of food components should be commensurate with their health conditions, which differ the diets of healthy people, sick people, injured people, suffering anxiety, insomnia, or depression.
4. The weather conditions. Nutrition for training or participation in sports competitions must vary, depending on the weather condition (hot, cold, or

wet weather), because it has an effect on the shooter's requirement for energy and fluids.

5. Paying attention to the ways of preparing food, as it is fairly important in the shooters' nutrition. Bad preparation of food may have a direct impact on the nutritional value of the food. That is related to the cooking style, as there are many vitamins lost because of the cooking process that is too long, because of its sensitivity to heat or solubility in water or oxidation.
6. Studies of Pavlov have confirmed that the good preparation of food, variety, methods of presentation, and its delicious smell have a positive effect in alerting the stomach to extract the juices to digest the food being consumed.
7. Regularly, pay attention to the times of meals, because it affects the secretions of digestive juices to digest food in a good way and not causing some disturbances in the digestion process. The time of eating a meal should be considered well before the training or competition so that the ingredients can be digested and absorbed prior to participating in training or competition. Taking this into account will avoid any problems of the respiratory system as a result of the fullness of the stomach and the pressure on the diaphragm muscle or impeding its movement in the process of inhalation and exhalation.
8. Consider the principles of good digestion, which its first stage begins in the mouth and ends with absorption. According to Dastre, we do not feed on all what we swallow, but only on the good digestion results of this food.

In order to achieve this, shooters must take into consideration the following points:



1. Good food chewing: It's one of the most important factors to avoid gastrointestinal disorders caused by the lack of good chewing, therefore, shooters must pay attention to the safety of their teeth because to be able to chew. In addition, they should also provide a calm and comfortable environment during eating, which prevents hasty or excessive eating unconsciously, to have longer mixing of saliva and food in the mouth that facilitates the digestion process of carbohydrates which starts its first digestion stages in the mouth.
2. Conducting a periodic medical examination of the digestive system: The shooters must pay attention to the medical examination of their digestive system to ensure its safety and early detection of any problems, infectious diseases, or diseases caused by malnutrition. Those shooters who suffer from some of these diseases or contagious infections should consult a specialist doctor for treatment. These infectious disorders or diseases related to the digestive system inhibit digestion and absorption, which affects the health and physical condition of the shooters and their performance, as a result .

Generally, having a fixed weight is one of the most important indicators of following a balanced diet in terms of quantity and quality. Bogey believes that athletes' weight stability is one of the most important indicators or signs of concerning about the exact proportions of their daily diets according to the scientific fundamentals of athlete's nutrition .

Accordingly, athletes, by daily body weighting, can detect any significant increase or decrease in their daily diets and ensure the moderation and balance of their diet. Nevertheless, if the amount of the increase or decrease in the quantity and proportion of the components of their meals is slight, it cannot be observed accurately and immediately. But if it is more than that, it can be detected by

weight, then this new situation will take some time following a diet to retain the ideal weight of the body, by working to increase or decrease the weight as planned.

- In general, Bogey confirms that any excessive food intake is wrong, as it does some trouble and digestive and health disorders, leading to obesity and negatively affecting the performance level in the training and competition stage. Nutrition also raises the level of athletic performance and may accelerate the recovery after games performance, and we should not forget that it is possible for food to have an adverse effect on the shooter in case of nutrient imbalances, causing damage to the process of sports performance. Thus, we must know the most important principle of nutrition and its value for the athlete, as well as observing it carefully, whether in home, on normal days, or during training camps. So, Take this into account.

The Main Principles of Nutrition for Shooters

- Providing the body with the necessary energy that qualifies it to perform the basic duties, especially when performing daily exercises.
- Giving great importance to the food balance and its relevance to the activity of the shooter at the time of training and game.
- Selecting suitable food for training modules or games, even during the post-training rest period.

Many studies, for many years, have shown that workers who do not depend on vitamins in their diet, and while the work process, their ability to work decreases by 20-17% of the overall capacity within two hours, but at the end of the training module it can decrease by 23-33% after similar experiments and activity. After the workers involve the vitamins in their diet, their ability to work in the first hours did not decrease and may do at the end of the training module for up to 8-10% of the general capacity. John Paul says that there is no

standard diet for any physical or sports activity because nutrition is one of the subjects that are characterized by individuality and personal character. Influenced by many variables that relate to athletes, the most important are as follows:

- Age.
- Gender.
- Physical condition.
- Health status.
- Psychological state .

Psychological Aspects of Nutrition

There is much information that should be learned about the impact of the psychological condition on performance. It is agreed that psychological motivation plays a positive role in influencing the results of sports competitions; what shooter eat during the daily exercise and immediately before the competition may have a beneficial psychological effect as well. That may have a higher effect than its physiological effect in general. This seems obvious in selecting expensive meat or some foods that symbolize strength and youth, such as heart or liver. For example, we have to know that the athlete deprives himself of pleasures of life and follows a specific system; he is forced to during the sports season, which makes him feel that he must be rewarded with something in return. Trainers should give him expensive, delicious food to feel that his trainers are cheering and supporting him with their hearts and souls and appreciate his sacrifices, for that competition. This attention and nutrition care make the spirits of the athlete high and away from seduction and corruption. The preparation and type of food have a special effect on the moral state of the athlete and affects his psychology deeply. Many nutrition experiments in factories have shown that giving the worker some foods between the basic meals improves his ability to

work—the improvement is due to psychological and physiological aspects. Moreover, it has been proved that giving the player some sugar before sports competition has a good effect on his performance, but it is difficult to say if it is psychological or physiological. Therefore, we should not neglect the psychological effects of food, customs, and nutrition traditions that raise the spirits of the athlete.



Physiological Aspects of Food and Sports

Food Digestion and Sports Activity

Attention should be given to the meal before the sports competition. Once we know the state of psychological disorder experienced by the player before the game, we find that carefully selecting food of a certain kind affects him psychologically. We have noticed this repeatedly in relation to the meal prior to the game. The type of meal either has negative or positive results according to what is provided to the shooter. Most shooters often lose their appetite before the games and some suffer intestinal pain, diarrhea, or other symptoms that can be defined as physiological symptoms of the beginning fever. So, giving some sorts of food to the player before the match may affect the game result badly; it may lead to gastrointestinal disorder and possibly detrimental effect on the outcome of the game. In such cases, giving a meal of a special kind before the game, at least 3 to 4 hours is recommended on the condition that the meal is easy to digest.



Food Energy Sources for Shooters

The energy used during shooting is not much affected by the pre-competition meal since the performance is subjected to the training and preparation method of the shooter. Nevertheless, the type of food affects only the amount of energy produced; it is also clear that the consumption of muscle energy varies from competition to another. In this field, and in order to understand the meaning of energy consumption during the muscular effort, we give the reader a simple idea of the chemical changes in the muscles after being alerted. Muscles stores the energy in the form of an animal starch (glycogen), which consists of blood glucose, the full muscular system contains 150-250 grams of this starch. The stored starch decreases after muscle contraction and may disappear completely if the muscle activity increased. After resting for a while, the animal starch goes back to its normal rate, and when the starch disappears, an acid called lactic acid will arise which will release thermal energy during this chemical reaction. When the person makes much effort, the lactic acid accumulates in the muscle, causing muscle fatigue if the effort has gone too far. Muscles also contain phosphorous organic compounds, which are the energy stores that benefit muscles when contracting. They are called phosphorylation-adenosine-triphosphate. When the muscles contract, a decrease in these phosphorus compounds comes to the surface due to its decomposition and the release of the stock. Muscles can perform some contractions in the absence of oxygen due to the energy released from these Phosphorus compounds. Furthermore, the transformation of starch to lactic acid does not need oxygen, as muscles only need oxygen to oxidize lactic acid to carbon dioxide and water. This is done in the resting stage after the end of the muscle activity, as the lactic acid oxidizes and turns into animal starch. On the above, muscle contraction does not



require oxygen, but muscles need oxygen to restore its contents of energy sources in a form of phosphorus compounds and starch animal. In addition, the contraction of muscle affects the blood vessels within, straining it and preventing blood from access to the muscle. Muscles obtain the energy of contraction from the chemical reactions mentioned previously; then the blood flows again within the blood vessels when the muscle is relaxed besides oxygen to restore the energy stores again. The lactic acid increases inside the muscle during intense muscular exertion, which causes inhibition of chemical reaction, making the energy sources stop working, leading to muscle fatigue. That fatigue inhibits muscle activity, and when they relax the lactic acid inside goes from directly to the blood, which reduces its ratio, allowing the muscle to contract again.

Food elements are divided into two parts:

Nutrients producing energy:

- Carbohydrates
- Fats
- Proteins
- Nutrients non-producing energy:
- Mineral Salts
- Vitamins
- water

Carbohydrates

It mainly consists of carbon, oxygen, and hydrogen. Carbohydrates should be 55–60% of daily human food; each gram of carbohydrate gives 4 calories.

Calorie: The amount of energy needed to raise one gram of water one Celsius degree e.g. from 13° to 14°.

Functions of Carbohydrates

- Energy supply.

- Provide proteins for the process of building cells and repairing damaged ones.
- Help with lipid metabolism.
- Carbohydrates, especially, glucose in human blood, are the main source of food for the central nervous system.
- Carbohydrates help in the process of digestion and absorption of food, specifically, insoluble fibers.
- Carbohydrates, specifically soluble fibers, help to get rid of harmful cholesterol of the body .

Fats

Like carbohydrates, fats are mainly composed of carbon, oxygen, and hydrogen.

Functions of Fat

- It is considered the largest energy stores in the body.
- Fat is the richest energy source in the body as every 1 gram of fat gives 9 calories.
- Fat helps to maintain body temperature because of the stored fat under the skin acts as a thermal insulator between the body and the external environment.
- Fat is a source of soluble fats and fats' transporters such as vitamins (A, D, E, and K)
- Protecting important internal organs such as kidneys and heart.
- Resisting hunger.

Fat should be 25-30% of the daily human diet.

Table 2: Body fat stock of proteins

Proteins

Protein is an energy-producing component, although it can only be used to produce energy in famine when carbohydrates and fats are drained as sources of

energy. Carbohydrates are the fastest and easiest sources of energy production, then fats, and then proteins. Each one gram of protein gives 4 calories; protein is the component of muscles, ligaments, tendons, hormones, skin, and internal organs. The main sources of protein are cereals, legumes, and meat. Proteins should form 10-15% of the daily human diet. It is recommended to be 0.8 g protein per kg of body weight daily. For example, If the body weight is 100 kg, this person needs 80 grams of protein a day.

Amino Acids

The primary unit of proteins. A person obtains proteins from plant and animal sources. There are 20 amino acids, the body produces 11 amino acids and 9 amino acids are not produced by the body, called non-essential and essential amino acids, respectively. Vegetarians should diversify their vegetarian food in order to get all the amino acids, especially the essential ones. On the other hand, people who eat meat get all the amino acids easily.

Table 3: Essential and non-essential amino acids

| Non-essential | essential |
|---------------|---------------|
| Alanine | Histidine |
| Arginine | Isoleucine |
| Asparagine | Leucine |
| Aspartic acid | Lysine |
| cystine | Methionine |
| Glutamine | Phenylalanine |
| Glutamate | Threonine |
| Glycin | Tryptophan |
| Proline | Valine |
| Serine | |
| Tyrosine | |

Mineral Salts

Mineral salts are not considered a source of energy, such as carbohydrates, proteins, and fats. However, mineral salts have an important role in human life.

Functions of Mineral Salts

- Engage in forming the bones and maintain it.
- Engage in forming hormones and enzymes.
- Play an important role in maintaining the water balance of the body.
- Play an important role in muscle contractions and delivery of nerve impulses

Table 4: Basic mineral salts in the body, its functions, sources, and the amount of daily intake.

| The name | The amount of daily intake | function | Source |
|------------|--|--|--|
| Sodium | Men and women of less than 2400 mg | Maintaining the balance of the body's fluids | Manufactured Salt and food |
| Calcium | 1500-1000 mg | Bones and teeth formation; muscle and nerve contractions | Milk and vegetables |
| Phosphorus | 1200-800 mg | Bones and teeth formation and membrane cells | Meat, chicken, fish, and milk |
| Iron | For a man 10 g. For women, 10-15 mg | Oxygen cells transference | Meat, chicken, fish, dried grass and fruit |
| Magnesium | For a man of 350 | Bones and teeth | Grains and |

| | | | |
|--------|---|---|---------------------|
| | mg. For women, 280 mg | formation and muscle functions | vegetables |
| Zinc | For a man 15 mg Women 12 mg | The immune system and the metabolism of amino acids | Meat, chicken, fish |
| Iodine | 150 mg for men and women. 220 mg for pregnant women. | Thyroid hormones | Salt and sea water |

Water

The human's body contains 40–70% of water so the water is very important for our health. One must get 2.5–3 liters of water per day. It also maintains the temperature, as is a protector for joints and other tissue. Water helps in the waste disposal and transport of food and is a major component of blood plasma.

Water can be derived from three sources:

- Eating food
- Drink fluids
- Metabolic processes

The body loses water through four ways:

- Urinating
- Disposal
- Sweating
- Breathing

During the practice of physical activity, the breathing process increases as well as the sweating process, therefore, you have to compensate for the fluid loss by drinking small amounts of water continuously to prevent dehydration. It is

recommended to exercise physical activity in the morning and in the non-hot times to avoid losing large amounts of water and drought prevention.

Vitamins

The main function of vitamins is to regulate the chemical reactions of the body. In comparison with carbohydrates, the body proteins and fats more than vitamins—only small amounts. Although there is no particular diet provides the body with all the vitamins, vegetables and fruits are considered very rich sources of vitamins.

There are two types of vitamins:

- Fat-soluble vitamins (A, D, E, K)
- Water-soluble vitamins (B, C complex)

Table 5: Vitamins, its daily intake, functions, and source:

| Vitamin | The most important sources | Function | The need | Transport mechanism |
|---------|------------------------------------|---|---|----------------------|
| A | Dairy products, vegetables, fruits | Skin, vision, immune, bone growth | Man 1000 micrograms, Women's 800 micrograms | Fat-soluble vitamins |
| D | Dairy products, the sun's rays | Bone growth and health | Men and women 5-15 micrograms | Fat-soluble vitamins |
| E | Vegetable oils, grass | Protecting cell membranes from damage caused by oxidation | Man 10 mg, Women 8 mg | Fat-soluble vitamins |
| K | Produced in | It helps in blood | Men 70-80 | Fat-soluble |

| | | | | |
|--------------------|--|---|------------------------------------|---------------|
| | the intestines, grass | clotting | micrograms, Women 65-60 micrograms | vitamins |
| C | Citrus fruits, peppers, strawberries, potatoes | Anti-poisoning, amino acid metabolism, immune, injuries healing | Men and women 60 mg | Water-soluble |
| B1 (Thiamine) | Legumes, red meat, and grains | Carbohydrate metabolism | Man 1.2 mg, Women 1.1 mg | Water-soluble |
| B2 (Riboflavin) | Milk and grass | energy production | Man 1.3 mg, Women 1.1 mg | Water-soluble |
| Niacin | Milk, meat, fish, and poultry | Carbohydrate metabolism and energy production | Men 16 mg, Women 14 mg | Water-soluble |
| B6 | Vegetables, fruits, meat, fish and legumes | Metabolism of amino acids | Men 1.3–1.7 mg, Women 1.3–1.5 mg | Water-soluble |
| B12 | Milk and meat | Composition of cells and nerves | Men and women 2.4 micrograms | Water-soluble |
| Folate | Legumes, seeds, and grass | Essential to the formation of new cells | Men and women 400 micrograms | Water-soluble |

| | | | | |
|------------------|------------------------------------|---------------------------------------|-----------------------------|---------------|
| Biotin | Legumes, egg yolks | Metabolism of amino acids and fats | Men and women 30 micrograms | Water-soluble |
| Pantothenic acid | Eggs, legumes, red meat and grains | Energy production and tissue building | Men and women 5 mg | Water-soluble |

Caffeine

Caffeine is not considered a food item but is found in food, such as coffee, tea, and chocolates. It is a natural tonic which can increase the heartbeat rate, raise blood pressure, and increase the level of vigilance in some people. Eating large amounts of caffeine can lead to headache, nervousness, stomach discomfort, and diarrhea. Caffeine is a diuretic, and thus, it could lead to the loss of a large amount of fluid and therefore dehydration.

Alcohol

Alcohol is not considered of food elements, but each gram of alcohol gives 7 calories. Alcohol is diuretic thus could lead to increased fluid loss and negatively impact on the level of athletic performance. So, it is not recommended to take alcohol before and after physical activity. Alcohol causes higher blood pressure.

Feeding in Competitions

- Pre-competition.
- During the competition.
- Post-competition.

Firstly: Before the competition

It can be a food intake before competition (match) a dilemma for many athletes and depends primarily on the psychological state of Shooter, since thinking about the race and the possibility of winning and losing makes Shooter taut psychologically, leading to eating shooter large amounts of food or



avoid eating food in sufficient quantities and in either way the result is dangerous shooters in terms of the result and this should follow the following indicators:

- 1) Must be the last meal of food at least three hours before the start of the competition, especially in hot climates because the blood immediately after the digestion of food turns into the body to the digestive system, causing withdrawal of blood, and I said in the muscular system with a feeling aimed to cool after eating a big meal, if continued Shooter training cause him stomach pain, nausea, vomiting and other symptoms that appear on the Shooter.
- 2) Food intake should be in sufficient quantities include not feeling hungry or weakness due to lack of food in the course of the competition, and must be the amount of food intake degree so that the stomach and the upper section of the intestine free minute during races.
- 3) Food and fluids must provide a good condition of the body in the Drunk during the competition time.
- 4) Food must be of the usual type taken by Shooter.
- 5) Non-invasive salt water before eating contest.
- 6) A good meal for Shooter before the game must be composed primarily of carbohydrates as it is easier to digest than proteins and fats can be converted entirely into energy for a little physical effort as well as stored in the liver and muscles.
- 7) In recent years, it has become customary when a section of the shooters completely eat a liquid, especially those who suffer from digestive disorders, making them the psychological comfort during the competition also aimed during certain parts of the race covers a little bit of food in liquid form during the past as in the races marathon and endurance, these fluids contain glucose and substance that are in the blood by approaching a) 3 g (this prevents a decline in the concentration of glucose level in the blood which causes the rotation and intense sweating and fainting cases.

Second: During the competition

We note in the games that need endurance like a marathon that allows the player fluid intake by stations in the road and so to meet the needs of the body of salts and minerals and also in the hot and humid climate players take some fluids during the game and in the periods of rest in order to replenish the body of salts are also of the most important elements of Shooter during the competition to maintain the constant focus of Shooter during the competition.



Third: After the competition

Must work to compensate for the lost Shooter of carbohydrates and other food after the competition (where taking a major food meal after the competition at least one hour (But if the proposal coming to another competition the next day, the re-energy stocks to the liver and muscle fiber must It depends on the intake of food easy to digest.

The causes of poor nutrition for some of the athletes:

- 1) Laziness and lack of time.
- 2) A limited budget.
- 3) Low cultural awareness among the players of the food.
- 4) Bad eating habits.
- 5) There is no skill in preparing good food for the athlete

Chapter 18

Tests and Measurements

Tests and measurements

Standards and tests play a key and important role in the field of sport so interesting behavior of the motor of an individual athlete during the performance, so we find that this behavior monitoring and evaluation can be an individual athlete dealing with the aspects of physical, physiological, health, motor, mental, emotional and other perspective that the human single unit integrated, which is based on foundations and scientific theories, we find that the theoretical and practical scientific research founded on the measurement and testing in the field of sports.

Measurement definition (Measurement)

Is a method to collect data and information in a quantitative manner about the size thing is done by special technology and tools based on standardized judgment in the evaluation process. The definition of another is the means by which the precise identification of the quantitative aspects as well as the characteristics of the object to be measured.

Test Definition (Test)

Test as a tool or a means used to do a certain measuring known, this tool will be written or verbal or mechanical tool, or another type.

Definition of assessment (Evaluation)

It is an estimate of the value of the measured thing and beyond the assessment purely abstract measurements where built on the information collected from the measurement and testing process for the issuance of the substantive provisions. The definition of another is a dynamic

process of making a decision which gives a value judgment about the quality of what has been measured, such as a test mark or physical performance.

Measurement, testing and evaluation of Shooter objectives:

There are six general objectives, namely:

1. Category: Initial assessment test allows the examiner to classify shooters by the ability and readiness, and thus facilitate client training division of shooters into groups according to their abilities.
2. Diagnosis: It is often used to evaluate the test results to determine the strengths or weaknesses of the Shooter
3. Forecasting: Through measurement and evaluation can predict the extent of the success of Shooter or excellence in the practice of sport shooting
4. Stimulus: Aimed at stimulating progress through the knowledge of its outcome or performance assessment.
5. Achievement: Should be in any training program establish a set of goals that can be accomplished by evaluating the levels of the participants.
6. Training Evaluation: Training programs calendar.

Shooter appropriate test specifications:

1. There are many specifications that should be displayed by the test, including:
2. It must be tested variables to be related to the sport of archery
3. It must be the test to be used to measure the true capacity to be measured.
4. It must be the test to be used on a high degree of stability.
5. It must be the way the test procedure simulates to the greatest extent possible, the performance of Shooter



The objectives of the physiological assessment of Shooter:

Physiological tests seek to achieve the following objectives:

1. Shooter know the strengths and weaknesses of the physiological has, to illustrate the extent of its capabilities compared with the general standards.
2. Provide preliminary information that helps to describe the proper training, and make it possible to know how to improve or change the output of the training in physiological aspects.

3. Tests themselves are considered an educational help aimed to better understand the functional condition and what is happening inside his body as a result of physical training, which makes him more eager and interested in this training.
4. Tests are considered in itself is just a tool used to find out more details about the case of Shooter physiological and thus complement the information available on the proposal through its performance in the field.

Shooters measurements analysis

Measurement Report

The measurement itself is made and then collect data or necessary measurements is only a first step implementation of laboratory testing step, the next step, which is not less important than the first they analyze these results an objective analysis and presentation of structured as contained in this presentation of tables and graphics graphic.

It has been the practice that the report is written as follows:

- 1) Measurement Name: And clearly stating the measurement name.
- 2) The purpose of measurement: This is where the stated purpose or objective of the measurement, and there may be more than one goal.
- 3) Used equipment: And where it mentions all the tools and devices that have been used in the measurement in detail.
- 4) Measures: And where a detailed explanation of the steps of measurement with the number of male shooters, noting that clarity in explaining the steps of measurement makes others able to repeat the measurement and then compare the results with previous measurements.
- 5) Results and discussion: This part of the most important parts of the report, and is the first show results also appeared in the data obtained by the Shooter sorting and scheduling data with the work of illustrations of the phenomena under study and address the relationships between different variables, and then discuss these results in light of previous studies) if any (with an attempt to find an explanation for these results and linked to the theoretical framework of the phenomenon under study).

It should also take into account some of the notes when writing the results and discussion, including:

- Give independent figures attached to the tables, and also on the charts.
- Give a clear definition for each table or graph contained in the table.

- Write your own definitions as chart on the axes) _ o (p, for example: Represents (X) axis of time in minutes and represents the axis (r) heart rate per minute.
 - That is well and realistic presentation of data, and this should ensure the proper use of distances representative data on the pivot X and Y (good use of the graphic scale).
- 6) List of references: A list of references by the coach by reference to whether to work or measure to explain and discuss the results.

Physical tests

Justification for testing physical effort

It is used to test the physical effort and many of the most important variety (Hazza purposes)

1. Job evaluation cardiorespiratory.

Where during testing the progressive physical effort to measure the maximum consumption of oxygen ($VO_2\text{Max}$) or the product of the maximum heart (Q Max) or pulmonary functions, whether prior to the use of certain drugs to expand the air or after people in order to know its impact on them, or after surgery to determine the extent of functional improvement after conducting.

2. To detect any deficiencies in the ischemic heart muscle.

It is used to test the physical effort of those who suffer from shortness of the aorta or have congenital abnormalities in the coronary arteries or in the case of disease.

3. To evaluate the heart and regularity rate is used to detect the acceleration of the heartbeat or to find out the situation of arrhythmia especially from their siege of the whole of my heart.
4. To find out the blood pressure of the physical effort especially for people with higher arterial blood pressure response, as the physical effort in itself lead to high blood pressure, especially the pressure constriction.
5. To diagnose asthma caused by the physical effort of physical effort can test the good of the knowledge of unit status and the effectiveness of the expanded people's aerobic or other drugs medications in preventing asthma or mitigation.
6. To determine fitness) physiological efficiency (

The level of efficiency can be physiological evaluation of the athlete and then find out how much improvement in some physiological indicators on a particular physical.

7. To diagnose other symptoms associated with physical effort

It's in a range of symptoms such as dizziness, or chest pain, or headaches during physical effort, and others.

Prevent cases where a test of physical effort

On the instructions of American Heart Association, where there are many barriers that prevent a test of physical effort, and these barriers are in the following:

1. Acute inflammation of the heart, such as heart muscle inflammation, or endocarditis, or inflammation of rheumatic heart.
2. Severe heart failure.
3. Acute myocardial infarction.
4. Respiratory problem acute) asthma, pneumonia).
5. A sharp rise in arterial blood pressure (more than 250/120 mm Hg).
6. Acute kidney inflammation or acute liver disease.
7. Overdose of drugs affecting the cardiovascular respiratory system.

As you must take special precautions, and balancing the benefits of testing with the risk in the following cases:

- * Very tight in the aorta.
- * Very tight in the pulmonary artery.
- * Severe disruption of the heart ventricles systems.
- * Congenital problems in the coronary arteries.
- * Pulmonary arteries diseases.
- * Independence diseases.
- * Bleeding diseases.
- * Low pressure - resulting from the stand or change body position.

We will mention the measurement test for each element of fitness elements how to measure

Speed Test

) The enemy thirty meters (

The purpose of the test:

Speed Measurement.

Tools:

Stop Watch, three parallel lines drawn on the ground distance between the first line and the second 10 feet and between the second and third 30 meters.

Performance specifications:

- Laboratory stands behind the first line when you hear the start signal number that skips the third line.

- It calculates time laboratory starting from the second line until the arrival of the third line (30) m.

the conditions:

- All contestants test leads together to ensure the availability of the competition factor.
- Each laboratory that is being allocated to it in the warm.
- Laboratory takes the high start mode when the first start line.

: Registration

Laboratory records the time it takes to cut (30) meters from the second line to the third.

Compatibility Test

) Jump into the numbered circles (

The purpose of the test:

Measure the compatibility between the two men and eyes.

Tools:

- Stop Watch.
- Painted on the ground eight circles that the diameter of each 60 cm long, numbered circles of 1-20.

Performance specifications:

Laboratory stands inside the circle No. 1, when you hear the start bipeds together to the No. 2 and No. 3 to the circuit and then to the circuit signal No. 4, and so on until the circuit No. 20.

the conditions:

- Start circuit 1 and finished circuit No. 20, respectively.
- The performance is as quickly as possible.

Registration:

Laboratory records the time it takes to go through the eight circles.

Test flexibility

(Bend the trunk of the test stand)

The purpose of the test:

- Measure the flexibility of the spine on the horizontal axis.

Tools:

- Without a seat back height of 50 cm - flexible ruler is divided from zero to 100 cm installed vertically on the seat so that the number 50 parallel to the surface of the ruler and 10 parallel to the lower edge of the seat - a wooden pointer moves on the surface of the seat.

-

Performance specifications:

- Laboratory stands above the seat and feet Amidmost with the installation of the toes on the edge of the seat while retaining Balikatan Microdata, the laboratory bends the torso forward and down so that the index fingertips to push far away as possible to prove at the last distance up her for two seconds.

the conditions:

- You should not bend the knees during the performance.
- Laboratory two attempts, one up.
- It must be the trunk bend slowly.
- Stability must be at a distance of up to another lab for two seconds.

Registration:

- Laboratory record distance achieved in two attempts and calculated his greatest distance in centimeters

Test of strength

) Payment on the parallel to the power of the muscles of the arms and shoulders (

The purpose of the test:

- Measure the strength of the muscles of the arms and shoulders.

Tools:

- A parallel device in a level slightly higher than the level of high shoulders high and a wide chest for any laboratory.

Performance specifications:

- Laboratory stands in the face of crossbars at one end of the parallel, and when he gives the signal to start jumping on the parallel at the end so that based hands in a situation where the arms Madden.
- Laboratory begins to land his body down until your arms in a bending angle, and then begins to pay to extend your arms again.
- Repeat lab bending and pay a larger number of times without stopping even fatigue.

the conditions:

- Stop is prohibited during the performance or weighted body during payment is higher.
- Forbidden kicking your feet or knees bend during the payment up.
- Lab allows one attempt only.

Registration:

- Calculated for one for each correct and complete payment.

- Gives half a degree in the case of the arrival of the crease to half the distance are not allowed to account for more than four halves

Fitness Test

(Running shuttle)

The purpose of the test:

- Measuring Fitness.

: Tools

Stop Watch - Two parallel lines - the distance between them 10 meters.

Performance specifications:

- Laboratory stands behind the start line when you hear the start by running at full speed to the opposite line with both feet and then turn to the once again skips the starting line in the same way and then repeat the action again any laboratory that is 40 meters back and the return signal.

: the conditions

- Must go beyond the lab and start the line opposite line with both feet.

: Registration

Record laboratory time interrupted in the run specified distance 4×10 m from the start line until the signal exceeds the starting line after the cutting distance of 40 meters and back.

Accuracy test

) Correction to the overlapping circles (

The purpose of the test:

- Precision measurement.

Tools:

Five balls basket, wall in front of him flat ground - painted on the wall three overlapping circles dimensions are described Bechamel the lower limit of the large circle rises from the ground 24 inches, draws a line on the ground away from the wall by 20 feet.

: Performance specifications

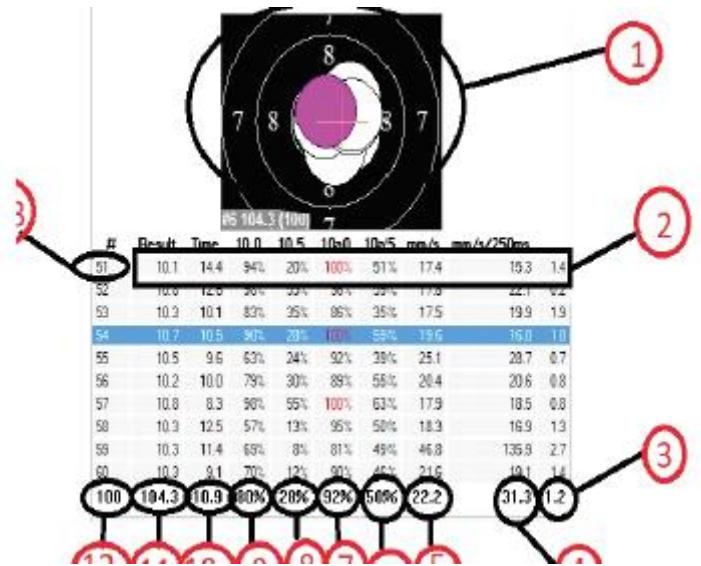
- Laboratory stands behind the line and then corrected the five successive balls trying to hit a micro-circuit.
- Laboratory right to use any hands or both in the correction.

: Registration

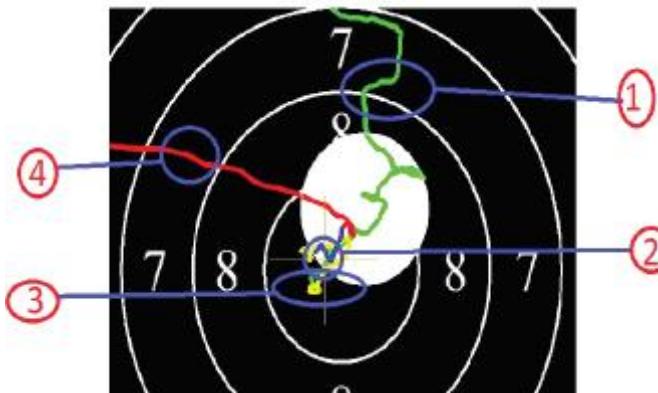
- If the ball hit the micro-circuits) inside the circle or specified lines (calculated for lab 3 degrees.

- If the ball hit the central circuit calculates lab 2 degrees.
- If you hit the ball great circle is calculated by one degree.
- If you hit the ball outside the three circles calculates zero degrees.

1. Shape and assemble the shots at a group
2. Each shot data
3. Measuring and the impact on the stability aimed at the moment out
4. The speed of movement during and before the gun shot out by 0.25 seconds.
5. Moving speed on the target
6. Stability for the size of the circle 10.5
7. Stability for the size of the circle of 10.0
8. The size of stability inside the circle 10.5
9. The size of stability inside the circle 10.0
10. Bullet time
11. Total result set of 10 shots
12. Total result totals
13. No shot



- 1) As a result of the shot
- 2) Speed up arms move on the target
- 3) Place shot



- 1- Green Line is to be representative of the arms movement on the target.
- 2- The sign + is a place for Latency shot point.
- 3- Yellow Line is the representative of the movement of arms on the target before the shot out of a second.

4- The red line is the movement of the gun after the departure of the shot.

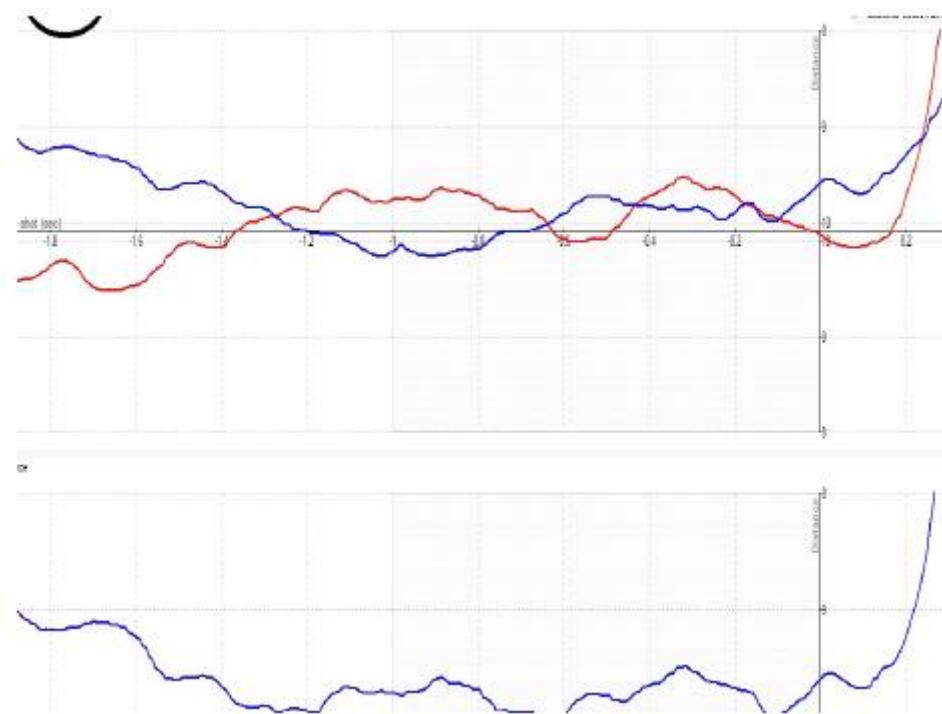
1. Training Information
2. About Competition
3. The time, date
4. Number of shots
5. As a result of shots without fractures and fractures and medium
6. As a result of the shots for the size of the assembly
7. Exercise time
8. Stability rate of time-lapse shots
9. Assembly size
10. Accuracy Latency for the middle of the goal
11. Direction) and transverse horizontal (beaten
12. The relationship between the X-axis and Y
13. For control
14. General shape shots

Through the list (Distance) is identified:

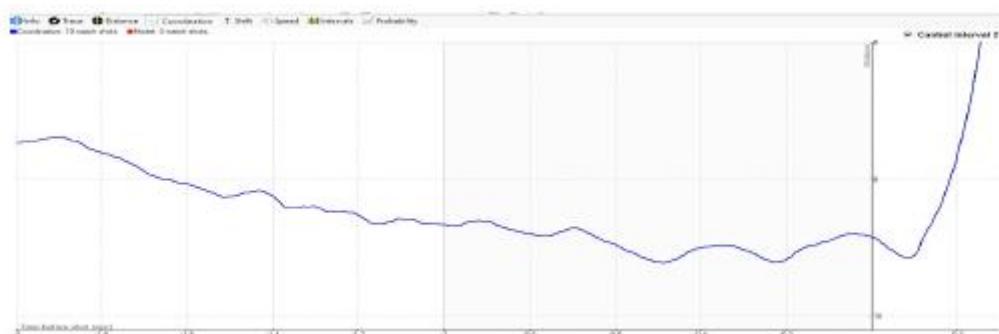
The distance between Latency points and the target center Vogued 3 types of curves in the graph for the time:

- * The absolute distance from the center
- * The distance from the vertical axis
- * The distance from the horizontal axis

The size of the horizontal and vertical vibration of each shot represents a horizontal red auction model to move the weapon and the blue line represents the vertical movement of arms and by identifying the majority of vibration aimed at the horizontal or vertical search is knowledge of the reason that causes the lack of stability for stability.



Through the list (coordination) are recognized:



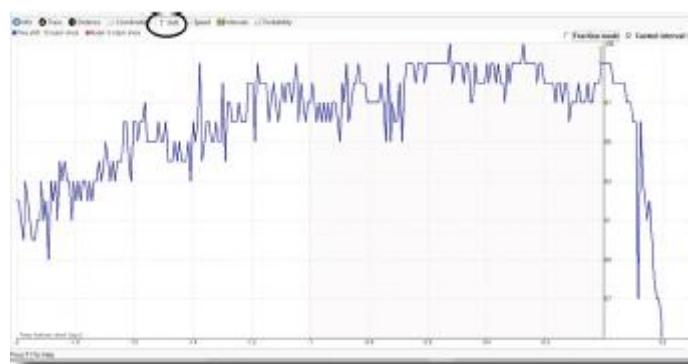
Intended compatibility is the ability of Shooter to choose the perfect moment to hit the shot in accordance with its ability to remain steadfast, one of the most important normative points managed to rule out the capabilities aimed in order to compete and the ability to choose the moment optimal for the launch of the shot can be partially offset stability of others good for Shooter. It analyzes the compatibility of the curve by the average of the values of the group or more.

And it is dropped at some time intervals before the release of the shot. The after shot from the target center and the nature of the change in the time before the exit shot (0.3-0.2 seconds) increase or decrease of the properties to assess the efficiency of the ability of Shooter compatibility whenever the distance between Latency points and the center of the target increase (distance from the target center) approaching the moment all the more it was aimed at a few compatibility

capacity. Too often Latency in Filbert and gun becomes worse in the last moments of the process of withdrawal.

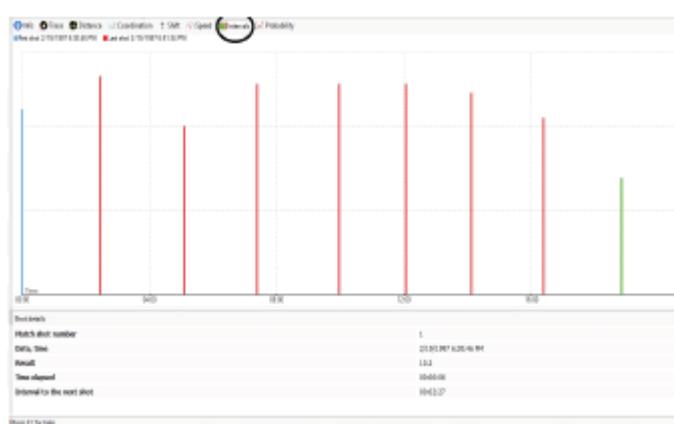
Change in the curve for the time Latency

The actual result of the throw and the result is estimated if all in more or less time than the actual time, shows in the graph



Through the list of time intervals (intervals) are recognized:

The high columns value shots while the distance between the columns are time intervals between shots and demonstrates the stability of harmony in the beating for a time on the length of time between the shots and determine the time intervals between shots to find out the most suitable time for rest of the Shooter between shots and clear as a result of each shot separately and the different length of time between the shot and the other shall be the result.



Prediction curve

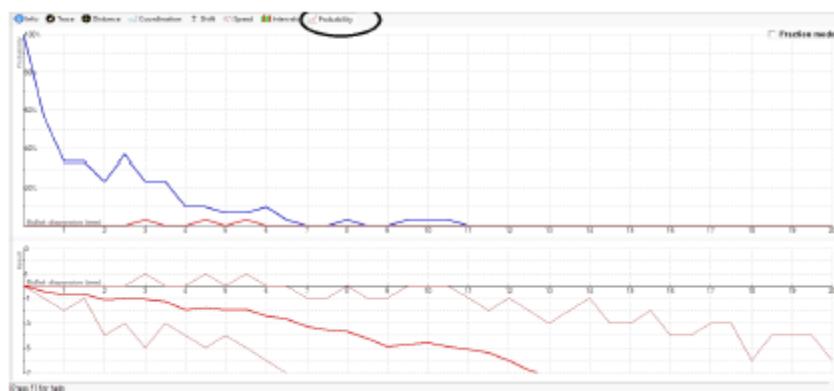
The impact of arms and ammunition shows the result of the shooting and testing of weapons and ammunition This method is used in Russia are linked to Venice in a private sickle is multiplied from 6 to 8 group which is measured as the distance between the two centers to the farthest distance between two shots and is done for each group and is considered the greatest value of this distance indication on the efficiency of arms and ammunition, a positive relationship is the second element

of the trim is to calculate this distance for 60 rounds on the same target, according to this method can be considered as these values are equal to zero for the systems of electronic training visual and extract the value of the result estimated beating these values are entered on the mainland Program.

The graph indicates

Curve I: The change in total batting with re-calculate the result.

Curve II: To forecast the result will be greater or equal to the primary result in addition to a certified average curve on the efficiency of the weapon and in this case, the largest number of random shots curves resulting from a lot of exercise analysis of the program was able to extract some of the results that can be the first glance unexpected. And a lot of exercise have some differences to the values of the efficiency of arms and ammunition are not equal to the grade.

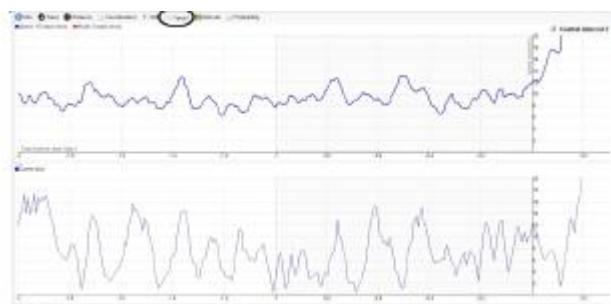


List (deeps) Speed

It is a graph that joins the speed of movement in the Latency area with time.

Shot routine

It is a step usual performance for the Shooter that Abraha even became the routine performance of the Shooter of the basics of the success of Shooter and get an advanced level in it to maintain the exemplary performance of your routine example in the shooting player injury shot can 10.9 But can repetition to what extent is here depends on how well the player for this routine and the ability to repeat those fixed steps fixed for each step about the times player through which repeat another 10.9 we can define the shot routine as usual performance steps for the player to output the best result we can measure red tape or know the strength of Symmetry in the shot routine through:



He writes the player steps and through the performance of the coach to the player control selects the time for each step separately and then the player starts the process of shooting and the trainer logs every step and it takes its time in implementation, for example:

- Preparation time took 6 seconds
- Latency took 9 seconds
- Follow-up 3 w
- Construction 10th

To illustrate the performance steps are explained to the coach we can use scatt device

| No shot | Preparation | Latency | The result | Note |
|---------|-------------|---------|------------|------|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| | | | | |

It can be through this table know the necessary times for each of these technical points and the most appropriate time for each step of the performance steps by connecting times result

| the performance | Time | Optimal time for Shooter | Note |
|-----------------|------|--------------------------|------|
| Prepare | | | |
| Tencin | | | |
| Continue | | | |
| Reconstruction | | | |
| The result | | | |

By identifying the strengths and weaknesses for each time step of its performance steps trainer can determine if any problem that occurs aren't performance in routine rounds

| Measurement | Current level | The required level | The difference | Observation |
|-----------------|---------------|--------------------|----------------|-------------|
| 1. Shot routine | | | | |
| 2. Stability | | | | |

| | | | | |
|-----------------------------------|--|--|--|--|
| 3. Pull Trigger | | | | |
| 4. Latency | | | | |
| 5. Timing | | | | |
| 6. Follow-up | | | | |
| 7. Symmetry between shots | | | | |
| 8. The actual result or estimated | | | | |
| 9. Compatibility in shooting | | | | |
| 10. Horizontal vibration | | | | |
| 11. Vertical Vibration | | | | |
| 12. The efficiency of the weapon | | | | |
| 13. The efficiency of tasks | | | | |

By pooling all this evidence and information on the performance of shooter shall be through technical performance of a clear vision through which the coach put training plans according to identify weaknesses and strengths of each player and work to improve the technical side of Shooter.

Chapter 19

Law

Law:

| Item No | Subject name | M |
|---------|---|--------|
| | About the International Law Shooting | 1 |
| 1-3-3 | Competition Venice | 2 |
| 2-3-3 | Venice Olympic competition | 2-A |
| 2-3-3 | Competition Venice 22:00 air pressure | 2-A-1 |
| 2-3-3 | Venice competition 50 m three conditions | 2-a -2 |
| 1-3-3 | Venice competition is the Olympic | 2-B |
| 2/1-3-3 | Venice competition 50 m recumbent | 2-B-1 |
| 1-3-3 | Venice competition 300 m large caliber | 2-B-2 |
| 2/1-3-3 | Pistol competition | 3 |
| 2-3-3 | Olympic pistol competition | 2-A |
| 2/1-3-3 | Pistol competition 22:00 air pressure | 2-A-1 |
| 2-3-3 | Pistol competition 25 m rapid | 2-a -2 |
| 2/1-3-3 | Pistol competition 25 m Ladies | 2-a -3 |
| 1-3-3 | Olympic pistol competition is | 2-B |
| 1-3-3 | Pistol Competition 50 Men (Free) | 2-B-1 |
| 1-3-3 | Pistol competition 25 m Central Men | 2-B-2 |

| | | |
|---------|--|-------|
| 1-3-3 | Pistol competition uniform 25 m Men | 2-B-3 |
| 1-3-3 | Cartouche Competition | 4 |
| 2-3-3 | Cartouche Olympic competition | 4A |
| 2/1-3-3 | Pit dishes (dust) | 4-A-1 |
| 2/1-3-3 | Towers dishes (Skateboard) | 4-A-2 |
| 2/1-3-3 | Competition shotguns Olympic | 4-B |
| 2/1-3-3 | Double dishes (Dell dust) | 4-B-1 |
| 2/1-3-3 | Animated goals Competition (non-Olympic) | 5 |
| 2/1-3-3 | Competition 50 m moving target | 5-A |
| 2/1-3-3 | Competition 50 m goal Mixed | 5-B |
| 2/1-3-3 | Competition 22:00 a moving target | 5-c |
| 2/1-3-3 | Competition 22:00 Mixed moving target | 5-d |
| | Target Sprint Competition | 6 |

| Number | Exercise time | Surface throwing distance | Type Shooter | Competition | M |
|--------|---------------|---------------------------|--------------|--|---|
| 24 | 75 | 10 | Men / Women | Competition Venice 22:00 air pressure | 1 |
| 45 | 165 | 50 | Men / Women | Venice competition 50 m three conditions | 2 |
| | 50 | 50 | Men / Women | Venice competition 50 m recumbent | 3 |
| | 180 | 300 | Men / Women | Venice competition 300 m large caliber | 4 |
| | 120 | 300 | Men | Venice competition 300 m large caliber uniform | |

| | | | | | | |
|--------|--|--|----|-------------|---------------------------------------|----|
| 24 | 75 | | 10 | Men / Women | Pistol competition 22:00 air pressure | 5 |
| 40 | Two stages each stage 30 i each stage 2 mg every 5 mg i in 8/6/4 seconds | | 25 | Men | Pistol competition 25 m fast | 6 |
| 40 | Slow 30 i 6 mg each in 5 i | | 25 | Ladies | 25 m pistol competition Women | 7 |
| | 6 mg each 5 i in 5 minutes | | | | | |
| | 90 | | 50 | Men | Pistol Competition 50 Men (Free) | 8 |
| | Fast 30 i 6 mg each in 5 i | | 25 | Men | Pistol competition 25 m Central Men | 9 |
| | Slow 30 i 6 mg each 5 i in 5 minutes | | | | | |
| | 4 mg each 5 i in 20/10/150 seconds. | | 25 | Men | Pistol competition uniform 25 m Men | 10 |
| | | | 50 | Men / Women | Competition 50 m moving target | 11 |
| | | | 50 | Men | Competition 50 m moving target mixed | 12 |
| | | | 10 | Men / Women | Competition 22:00 a moving target | 13 |
| | | | 10 | Men / Women | Competition 22:00 Mixed moving target | 14 |
| Number | Time Open | | 10 | Men / Women | Target Sprint Competition | 15 |

Safety Instructions for Shooting sport:

Security has important International Federation rules of shooting sports specific safety which only requires implementation in the matches of the International Federation Shooting Sports and basic precautions so take the necessary steps to implement the Organizing Committee is responsible for the safety and the notification of the arbitration committees and officials of fields and officials of the difference in any instructions waged by security.

Shooters and staff safety in the fields of shooting and audience) viewers (always need constant care in the handling of arms and commitment during the move between shooting ranges and recommended all packages for all workers in the front line of shooting operation workers wear clearly visible colors jackets. The personal commitment is the basis of all this and when the weakness happens in this personal commitment, it is the duty of shooters and managers of teams help enforce and achieve this commitment.

For reasons of security can be a member of the panel of judges or field officer to stop shooting at any time and must shooters and officials of teams to notify field officer or members of the rulers immediately any case represents a dangerous or could cause an accident.

It can monitor equipment or field officer or member of the Referees Committee that deals with the stomach aimed including weapons for examination without his permission, but in his presence and with his knowledge and must be taken immediately act when there is a matter of dealing with weapons maximum care at all times.

During the presence aimed at the shooting station must always indicate the weapon to a safe direction, and when it is not the actual firing of weapons must be emptied and the opening of the moving parts.

- To ensure security should carry guns carefully and carefully collecting times even though it was empty of ammunition.
- Unused guns must be placed on the weapon holder or any safe place.
- All guns must be empty of ammunition, except during the presence inside the station firing and after the issuance of the order or signal show.
- Ammunition should not be placed anywhere in the weapon only when aimed at the shooting station and facing stands for extrusion machines goals) dishes (and the gun pointing to the direction of the target flight and after the issuance of the authorization of the judgment.
- When it gets malfunction or stop shooting should open arms and immediately discharged with permission from the referee.
- Do not allow the shooting Shooter's departure station before unloading the weapon.
- When you have finished shooting the last shot in before leaving the shooting field or before placing arms Al rack or store weapons or bag its own weapons, it must aim to make sure that they are completely free of any shots in the pipe or the Treasury must rule monitoring and control of it.

- It is not allowed to trade weapons and is a closed operation when workers in the front area exists from the shooting field.
- Remember your gun is your responsibility. Your right may be taken in the possession of it away if you do not use the safe and rational!

Standard and legal specifications for the fields of shooting (10 m -25 m -50 m -300 m)

| Shooting point measurements | Height of the target center | Throwing distance | Field | M |
|---|------------------------------|--------------------|--------------------------|---|
| Not less than 1 p.m. View | 1.40 m (+/- 0.5 m) | 22:00 (+/- 0.05 m) | 10 m Square | 1 |
| Rapid 50.1 m width x 50.1 m depth Central / Sire 100 m width x 50.1 m depth | 1.40 m (+/- 0.1 m / - 0.2 m) | 25 m (+/- 0.10 m) | 25 m Square | 2 |
| Not less than 25.1 m width m length x 25.1 | 0.75 m (+/- 0.5 m) | 50 m (+/- 0.2 m) | 50 m field | 3 |
| Not less than 6.1 m width x 25.1 m length | 15:00 (+/- 4 M) | 300 m (+/- 1.00 m) | The field of 300 m | 4 |
| Not less than 1 p.m. View | 1.40 m (+/- 0.5 m) | 22:00 (+/- 0.05 m) | Moving target 10 p.m. | 5 |
| | 1.40 m (+/- 0.2 m) | 50 m (+/- 0.20 m) | Moving target 50 m | 6 |
| Not less than 1 p.m. View | 1.40 m (+/- 0.5 m) | 22:00 (+/- 0.05 m) | Target Sprint | 7 |

Standard and legal specifications for the fields of cartridges

Fields that are created in the northern half of the ground ball must be planned so that the north towards the direction of the shooting to the north-east. The fields established in the southern half of the ground should be planned so that the ball towards the direction of the south are throwing to the south-east and this makes the sun always appeared aimed as much as possible during the

shooting during daylight hours. When you create a new shooting fields should note that the need to determine the fall of the spray area.

| Shooting point measurements | Height of the target center | Throwing distance | Field | M |
|---|------------------------------|--------------------|--------------------------|---|
| Not less than 1 p.m. View | 1.40 m (+/- 0.5 m) | 22:00 (+/- 0.05 m) | 10 m Square | 1 |
| Rapid 50.1 m width × 50.1 m depth Central / Sire 100 m width × 50.1 m depth | 1.40 m (+/- 0.1 m / - 0.2 m) | 25 m (+/- 0.10 m) | 25 m Square | 2 |
| Not less than 25.1 m width m length × 25.1 | 0.75 m (+/- 0.5 m) | 50 m (+/- 0.2 m) | 50 m field | 3 |
| Not less than 6.1 m width × 25.1 m length | 15:00 (+/- 4 M) | 300 m (+/- 1.00 m) | The field of 300 m | 4 |
| Not less than 1 p.m. View | 1.40 m (+/- 0.5 m) | 22:00 (+/- 0.05 m) | Moving target 10 p.m. | 5 |
| | 1.40 m (+/- 0.2 m) | 50 m (+/- 0.20 m) | Moving target 50 m | 6 |
| Not less than 1 p.m. View | 1.40 m (+/- 0.5 m) | 22:00 (+/- 0.05 m) | Target Sprint | 7 |

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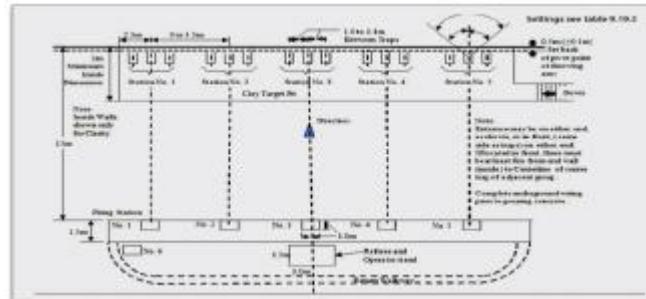
When you create a new shooting fields should note that the need to determine the fall of the spray area resulting from the shooting so as to be level and free from any obstacles so as to allow mechanical equipment to carry out the process of cleaning the land and restore the factory spray of lead material.

Technical specifications for the field of shooting cartridges

Dirt field

Extrusion machines dug dishes have the upper surface on the same horizontal plane shooting stations.

Each hole dirt machines on the number 15 machine extrusion goals, these groups are divided into 5 groups with each group on 3 machines and determines the middle of each compound branded coating on the upper surface of the room machinery so that the position refers to the middle of each total machine of machine sets which set point the emergence of the target machine launches either means an electric hand or electric microphones system must be in the operating system allows the operator to see the operating and hear the call of the shooters must also ensure that the launch of the objectives of equitable distribution of the goals of all shooters.



Which includes the distribution of goals in the round of 25 goal on 10 goals and 10 goals of the right of the left and 5 goals in front of me) center). (Each of the five groups launches 2 Goal Right, Left 2 Goal 1, the goal in front of me).

The five shooting stations must be designed on a straight line and at a distance of 15 meters back from the front edge of the surface of the machine room so that each station will be distinctive clearly box 1 p.m. × 1 m centering on a vertical imaginary line on the line of shooting stations and extending to the middle machine in each group machines , preparation plant sixth back and should be left and a little bit of the station (1) and about 2 m behind.

Equipped with lanes throwing the six table or holder of each lane where the Shooter put shots and other equipment by the presence of passage for the use of shooters in traffic from Terminal 5 to station 6 so that it is at a distance of 5 ~ 3 m behind the shooting stations are not allowed archers to pass between the lane and shooting stations. 3-5-19-3-6) Book International Shooting Union Law (

Skeet field

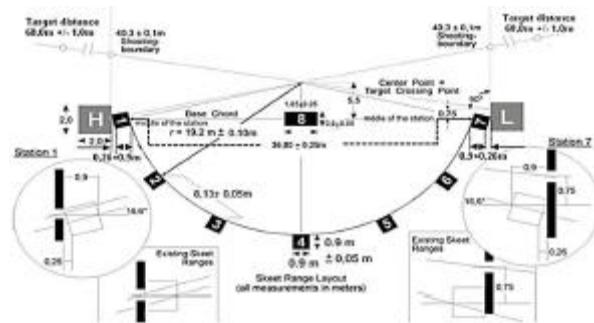
Shooting field consists of two towers machines high tower and tower low and 8 shooting stations. Stations (1) to (7) distributed on the arc of the radius of 19.2 meters.

The station is located (1) in the left side of the chord station is located (7) on the right side of the confrontation and the other side are equal distances between stations.

Shooting stations (1) to (7 square) shape aperture of 90 cm × 90 cm +/- 5 cm, and station No. 8 rectangular display 90 cm +/- 5 cm in length and 185 cm +/- 5 cm.

Each tower of the towers must prove its extrusion machine targets in a fixed position.

The right goals to pass through the circle of diameter 90 cm +/- 5 cm and is located at a height of 4.60 m +/- 5 cm above the intersection point targets.



Pacific Climate objectives must proceed to a distance of 67 minimum and 69 maximum measured from the face high tower and low tower behind the shooting stations (1) and (7). If you can check the correct distances compared rulers to determine the course objectives.

You must install a security barrier when you open the target exit each machine house so that it cannot see the operator by any Shooter from any station Shooting. This reserve is mandatory to protect the operator from direct injury or indirect from counter shots and protect Shooter of broken targets that emerge from the open tower.

You must run the operating targets machines either a manual system electric OH electric system microphones with the timing system so that it can factor operating sees and hears shooters racers and all the International Federation tournaments Sports shooting must use a time compulsory and which shall determine the immediate launch of the target and launch after a period of time not exceeding 3 second from the moment of an appeal aimed at the request target.

You must install the lamp colored lighting on the outer side of the kidneys high and low towers so that the lamp shines when it presses the operator on the key or the target launch button goes off when the target starting, it must be the lamp is visible to rule and prove on the side of skeet opposite to viewers machines Tower.

(06/03/22 International Book Shooting Union Law)

Venice standards 300 m and gun air pressure

(06/03/22 International Book Shooting Union Law)

7-4-1-1 uses only a single shot rifles and live hand each shot except Venice competition can be used if examined by the Department of Examination) CISM (Unified 300 m which permitted the equipment before the competition.

7-4-1-2 allows one per contest only a gun rehabilitation front liquefied liquidation or rear can contain light filters or colored and prevents them to be consoled system of lenses.

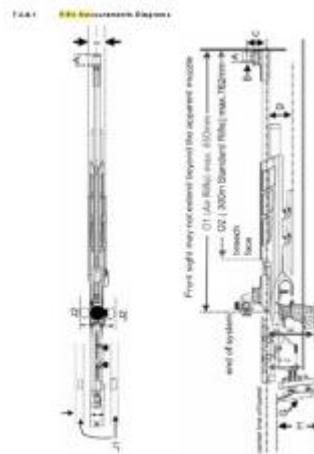
Venice standards 300 m and gun air pressure

It may be an adjustable up and down and can move to the right and to the left of the center or have spins around its axis vertical if used multi parts, all the parts must move or spin in the same direction from the center cannot be extended part of outer edges) more than 30 mm from the center line central line center is the vertical line which is perpendicular to the nozzle center line.

5.4.7 titrated rifles 50 meters

Allowed all guns from 5.6 mm

1. It shall not weight Venice 8 kg for men in all accessories used hand armrest or India Stop.
 2. It may not exceed the weight of Venice 5.6 kg in all competitions used hand armrest or India Stop.
- Venice specifications 300 meters are the same specifications Venice 50 meters) Men / Women (
 - The 300-meter rifles can be out of mind mirage strap can be a maximum of 60 mm display



| Venice | Caliber | Other Specifications |
|--------|-----------------------|--|
| 50 m | 5.6 mm (0.22 inches) | Only bullets made of lead or any similar soft material is permitted. |
| 10 pm | 4.5 mm (0.177 inches) | Allowed to use any form of projectiles made of lead or any soft material similar. |
| 300 m | 8 mm max | Ammunition from any description that can be launched without any risk to the player or any individual in the field / prohibited the use of tracer bullets blazing superstar. |

9-4-2-1 technical specifications of the weapon used (12-gauge shotgun cartridges)

- * It allows the use of smooth pipe guns, provided no more than 12 calibers.
- * Do not allow guns that operate automatic.
- * It is not allowed tapes or belts.

- * It allows piped with holes, provided they do not exceed more than 15 cm measured from the front of the pipe.

Ammunition used



The first integrated paper shotgun in Paris developed in 1808 by Swiss arms maker Samuel Jean Paoli (Jean Samuel Pauly) in conjunction with the French arms maker François (François Prelate). He invented the first self Paoli full padding cartridges: These cartridges included a base of red copper with gunpowder ignite mercury integrated) invented the main Paoli (,

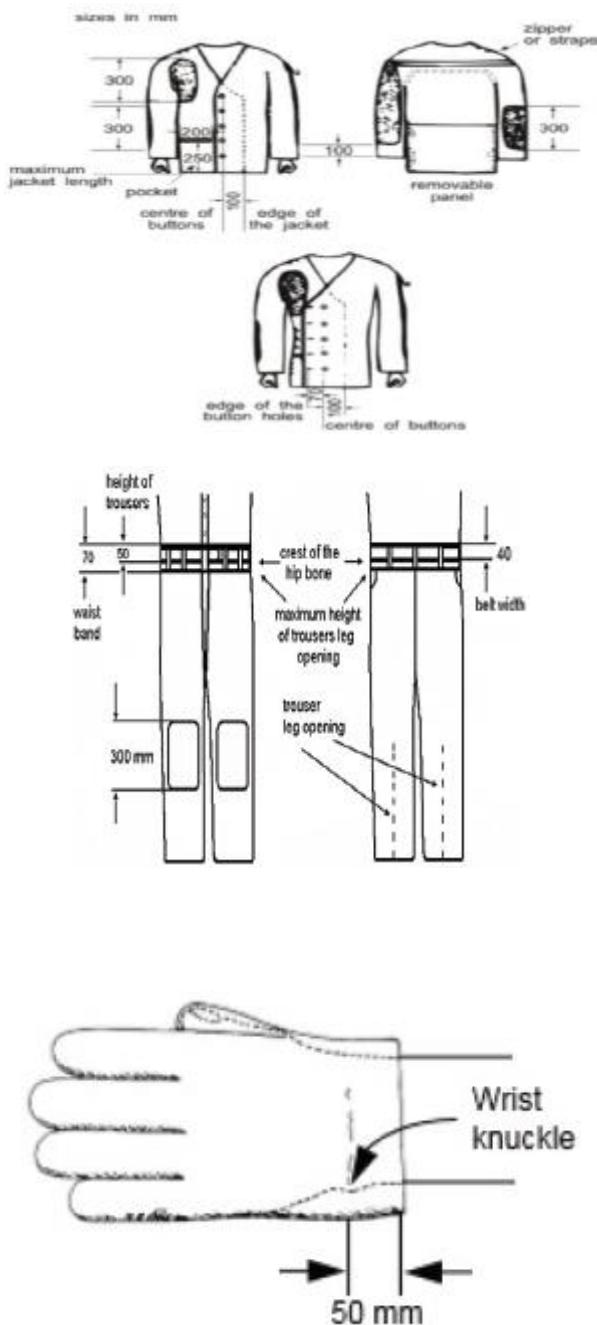
base of red copper with gunpowder ignite mercury integrated) invented the main Paoli (, paperback and a shot. Carrying the shotgun through the latch arms and launches by a needle.

Rules of clothing

7.5.1.1 - All Jacket Shooting Trousers leaps shooting must be made of flexible material does not change the physical characteristics or digitation more hardness or thickness under the conditions of shooting acceptable and common, and all lining and padding calendars must match the same specification as any lining and filler must but it is a quilt or cross-stitched or poster or installed in another way of external stitching for dogs in a way other than the normal detail points each lining or padding must be measured as a particle of clothing.

7.5.2.1 - Table titrated thickness clothing

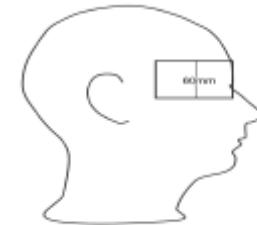
| Place of measurement | Jacketed | Trousers | Shoe | glove | underwear |
|----------------------|----------|----------|------|-------|-----------|
| Normal | 2.5 mm | 2.5 mm | 4 mm | | 2.5 mm |
| Normal | 5 mm | 5 mm | | | 5 mm |
| Normal | | | | 12 mm | |
| Strengthening | 10 mm | 10 mm | | | |
| Strengthening | 20 mm | 20 mm | | | |



Technical rules for clothes Shooter Cartouche

- * Shooter is responsible for appearing in the shooting field dressed suitable public for the occasion, and is controlled so by the panel of judges and colored clothes falsifier banned color, and prohibited any means or clothes help to stabilize or reduce the movement of the legs of the Shooter so as to ensure that no help or improve its performance in a way artificial make his preference for the rest of his competitors in the games.

- * Sports and allows in pants suits and training jacket for men and women and equivalent women's clothing like blouse and skirt out.
- * Sandals or similar without bandages or without background heels and without medical recommendation is certified allowed all.
- * Which allows no more than the high end of the tip 15 cm top center of the knee for men.
- * T-shirts, T-shirts or sleeveless are not allowed.
- * Military clothing design or special fishing colors of camouflaged not allowed.
- * In competitions organized by the International Federation of Sports Shooting must Shooter install the back numbers on the back top of the center line for him at all times during the formal training and competitions, are not allowed to Shooter, who is not wearing a number back to start or continue, and the number should be back large as possible so at least a height of 20 mm.
- * It must be written on the top of the shooting jacket Shooter from behind the highest number back the Olympic symbol and the letters short of his state and below the family name of Shooter the first letter of his name in English) Latin).
- * Eyebrows installed with the sides head cover, which exceed a height of 40 mm and allowed these eyebrows should not be in front of the vertical line extending from the front.
- * Bar to locate the rest in standby mode) skeet (. It is installed on the jacket shooting (shooting outside Gilet), a length of 250 mm and width 30 mm yellow color and specific black on the right side of the jacket shooting.



- 7.5.3 Shooting Shoes

- Ordinary street shoes or sports shoe light allowed in all situations and special shooting that do not exceed the following specifications and can be worn in competitions shoes.



| | |
|---|---|
| A | The maximum thickness of the soles of the toes. |
| B | Total length of the shoe according to the scale used feet. |
| C | The maximum height of the shoe does not exceed one third of the length. |
| D | The upper part of the severity of the shoe at a maximum thickness of 4 mm. |
| F | It must match the external shoe bends and cannot extend more than 5 mm from the outer dimensions of the shoe at any point. Fingers or heel may not be square or flat. |

Objectives

First gun and pistol air pressure

Pistol goal 10 meters

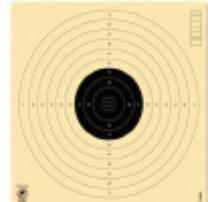
| | | | | | |
|---------------|---------|------------|--------------|----------|------------|
| Department 10 | 11.5 mm | +/- 0.1 mm | Circle 5 | 91.5 mm | +/- 0.5 mm |
| Circle 9 | 27.5 mm | +/- 0.1 mm | Circle 4 | 107.5 mm | +/- 0.5 mm |
| Circle 8 | 43.5 mm | +/- 0.2 mm | Department 3 | 123.5 mm | +/- 0.5 mm |
| Circle 7 | 59.5 mm | +/- 0.5 mm | Circle 2 | 139.5 mm | +/- 0.5 mm |
| Circle 6 | 75.5 mm | +/- 0.5 mm | Circle 1 | 155.5 mm | +/- 0.5 mm |

Interior ten: 500 mm (+/- 0.1 mm)

the pillow: Circles from 7 to 10 = 95.5 (+/- 0.5 mm)

The thickness of lines, circles 0.1 mm to 0.2 mm

The minimum area of the target card: 170 mm × 170 mm



The goal of a 10-meter rifle

| | | | | | |
|---------------|---------|------------|--------------|---------|------------|
| Department 10 | 0.5 mm | +/- 0.1 mm | Circle 5 | 25.5 mm | +/- 0.1 mm |
| Circle 9 | 5.5 mm | +/- 0.1 mm | Circle 4 | 30.5 mm | +/- 0.1 mm |
| Circle 8 | 10.5 mm | +/- 0.1 mm | Department 3 | 35.5 mm | +/- 0.1 mm |
| Circle 7 | 15.5 mm | +/- 0.1 mm | Circle 2 | 40.5 mm | +/- 0.1 mm |
| Circle 6 | 20.5 mm | +/- 0.1 mm | Circle 1 | 45.5 mm | +/- 0.1 mm |

Interior ten: Calculated shot ten internal (central (when serving hole shot on the circle / ten points completely).

(circles from 4 to 9) = 30.5 mm +/- 0.1 mm

Ten circles are a white dot = 0.5 mm +/- 0.1 mm

Eye protection

Since January 1, 2005 has been eye protection is mandatory for all.

Second cartridge

Technical specifications of the target (the dish)

According to organizational instructions for tournaments by the Union
Guardian Shooting:

- * Target the whole color may be black or white or orange or all title to be the target painted in white or yellow or orange
- * You must specify the target color in all games and tournaments International Federation Shooting Sports Program should also be the target color is clearly visible with the chosen background field) which featured them (under normal lighting conditions).
- * You must use the same goals in the same color in training, and in the finals must use targets containing colored powder and conform to the same specification) Weight (.
- * When you test the hardness target is excised target) dish (from the surface of the ground level) solid ground) by 1 foot 30)) and let him fall and is in a horizontal position on the ground, if the resulting refraction target to more than two pieces is good for use in training games and, if the result of refraction lower than that (two pieces), the degree of hardness of the target to be permissible limit is not used.



(6-3-2-8-6 Book International Shooting Union Law)

| | | |
|------------|-------------------|--|
| Diameter | 110 mm (+/- 1 mm) | A photograph of a single red target dish, which is circular with concentric rings and a central white dot. |
| Height | 25 mm to 26 mm | |
| the weight | 105 mm (+/- 5 mm) | |

Utility

Ear protection

Since 1994, the hearing protection is mandatory for all persons involved in the competitions in all disciplines. Human ear is a mechanism very sensitive and noise pollution after the appearance.

Types of hearing protection:

There are two categories of hearing protection: Such as those worn by the speakers, and »ear plugs« that fall into the ear canal and these categories are:

»Passive« reduce the noise to block sound waves during the orientation towards the ears.



»Active« that allows to receive normal audio levels where it can then hear a normal conversation, and a high-level noise can be reduced to acceptable.

Ear protection:

Since 1994, the hearing protection is mandatory for all persons involved in the competitions in all disciplines. Human ear is a mechanism very sensitive and after the emergence of modern noise pollution, built in defense mechanisms are inadequate when the noise resulting from the emergence of the modern world. Continuous exposure to loud noise can cause permanent damage to the ear and almost can be repaired. In the past, in industries such as textiles, where noise levels were high and constant, people have suffered severe and permanent damage due to the lack of ear protection.

Can produce weapons noise levels exceeding 120 DB (very high), and probabilistic damage found. Therefore, it is important that shooters, visitors rulers, workers wear ear protection fields to avoid permanent damage. (Weapon cartridges)

The initial damage raised is the difficulty of hearing a conversation when there is background noise, as can the individual suffering "tinnitus", a permanent ringing, buzzing or whistling in the ears, which can impair hearing persons involved in the competitions in all disciplines.

There is the possibility, however remote, to eye injury because of a defect in the gun or blowing breaking goals. And eye protection must be worn safety goggles at all times. It also advises the head of a hat; it will prevent debris that finds its way into the glasses and the front.

Shooting glasses:

Sunglasses are the best in protecting the eye, but may provide inadequate protection when they are made of a material is resistant to external stimuli) lenses thin exhibition to break easily (and not supported by a strong external frame, and be so small that when placed the gun in the shoulder may obscure vision by the edge of the glass or frame.

Although cheap can provide adequate protection but may not be correct visually and cause distortion of the field of vision. Therefore, the industry glasses special archery high resistance to external stimuli and treatment of evaporation on the surface of the inner lenses can be adjusted

height on the face of aiming to expand the field of vision and with the arms of solid and strong grant aimed stability on the face and not slipping in the case of sweating of the high temperature and the multiplicity of colors lenses It can change in different lighting situations and different backgrounds.

To improve the contrast between the target and the background in the light of the "color conditions" can be used for hard lenses; lenses brown bright sun, dark yellow or red or yellow to cloudy skies and light colors) yellow, transparent (for dim lighting conditions.

Chapter 20

Steroids

Steroids

brief history



These stimulants are used on animals and ancient examples that show the dogs and horse races that were held in those times and appeared in the English dictionary the word in 1889 Doping as a medical anesthetic mixture of aluminum. Steroids have been used in the Olympic races at the end of the

third century and used Finalists grades in France a mixture medically dependent on cosmetics), and use athletes Belgian sugar pieces after they poured on the following and others have used alcohol in 1882 was the first incident where he died the player English because of the abuse BENETTON a large amount of a mixture of heroin and cocaine through racing grades for a distance of 200 m between Bordeaux and Paris and in Oslo during the Winter Games in 1951, used the contestants on the ice and nitrogen found in their homes, many of the capsules used Kamentha. In the year 1952 resistance to the use of doping in Italy in 1954 held a series of scientific seminars until the year 1961, which saw the establishment of the first scientific laboratory to discover the use of athletes for doping in Florence, Italy, and in 1963 held in France's first Teach me conference to discuss ways to resist doping, which began It came to pass a law to punish doping users and has already passed this law in 1964. And the tenth Winter Olympics had been in 1968, France was the first session where the application of screening and control doping Munich Olympic Games in

1972 users of a system of detecting the 2078 player and the player ruled out of them seven players to prove their dealings steroids.

Montreal Olympics 1976: 2001 revealed the player and the player ruled out seven of them to prove their dealings steroids. Moscow Olympics 1980: Revealed on one of them 1667 have not ruled out the definition of doping: Study References available indicate that there are several definitions of doping the most important of that definition reached by the Medical Committee of the International Olympic Committee, where this definition to clarify the concept included in addition to the divisions in terms of type and areas of influence.

Definition of steroids

Concerns us here dealt with definitions of several definitions of doping, namely:

1. Definition of the International Olympic Committee Medical Commission:

Steroids are those substances stipulated in the list of the Olympic Committee in 1976 and called for prohibiting the use in the sports field and contained the following articles

- It triggers the central nervous system such as.
- Narcotic substances that help not to feel pain such as codeine.
- NAPOULE steroids.

2. The general definition of doping:

Activated each substance or medicine enters the body and in quantities not unusual for the purpose of increasing physical efficiency for higher athletic achievement in illegal ways and cause health damage when continuing to abuse.

The effect of stimulant drugs on the performance of the Shooter

- Sedative and remover of tension shooting player who needs to calm in muscular function compatibility nervous.



The causes of doping

1. Policy objectives
2. The goals of improving the social and cultural level
3. The human factor
4. media

5. Recognition and hobby

Detection methods of doping

There are many ways to detect doping, including:

- * Analysis of urine (optical and radiation analysis) to detect the remains activated.
- * Blood analysis.
- * Analysis of hair follicles.

And stimulants in general found the stimulant of the central nervous system and calming the central nervous system (in English: Narcotics) and drugs that boost the efficiency of the circulatory system and circulatory system beta and structural hormones (English: Anabolic Steroids) and hormones peptide (in English: Peptide Hormones) Human Growth (HGH) and enhanced red blood cells (EPO) which are substances produced by the body to control certain functions such as growth and production of red blood cells and increase muscle size and strength and improve the ability of blood to carry oxygen and then athletic ability to do exercises harder for longer periods. A diuretic Diuretics to expel fluid from the tissues and weight reduction in the games that require certain categories by weight (boxing, weightlifting, wrestling) or to expel stimulant substances from the body so as not to appear during the medical examination in the Olympic tournaments. And lead to general weakness, dehydration and stiffness.

Examples of some types of steroids used in the sports field:

the second group:

The drugs include the stimulant of the central nervous system:

- Kothamad
- Decaffeinated
- Doxapram
- Bamejrad
- For Atnasul
- Omvinasul
- Aithameevam
- Bertoudi
- Esther Knin

Group C:

It includes similar drugs in its work to the work of the sympathetic nervous system:

The first group:

And include drugs for respiratory stimulant motor:

- Amphetamine
- Ethyl Vitamin
- Chlorine vitamin
-
- Dai-methyl amphetamine (Dimethyl amphetamine)
- Ga vino Xan
- Phentermine
- Methyl amphetamine
- Nour Sudwidran

Group E

And it includes narcotic drugs such as:

- Codeine
- Vnzukin
- Dexter Moramed
- Trimbr religion
- Methadone
- Bamonden
- Moro Fein
- Batherin
- Hedrokoudov
- Khadro Morovon
- Levorphanol
- Binary Alheidrakudaaan
- Codon Oxide
- Dipipanone

Pharmaceutical groups have special reservations when used:

- * Topical drugs.
- * Hormones Alchortozonah.
- * Alcohol.
- * Marijuana) was added in 1988)

- Ephedrine

- Mtiuksvinamen
- Etafedrine
- Methyl ephedrine
- Aazutharin
- Aazobrinalin

Group D

The hormones include constructive:

- Flex Menstruum
- Thanederlon
- Mithanolon
- Owachsteron
- Mithandinon
- Oxy Mithalon
- Methyl testosterone
- Stanzulul

Here are some brand names for this group

- We have Paul
- Breuemopoulan
- Strumba
- Dhikadrapaulin
- Briforon

Third: Other means activated

1. Blood transfusion) and blood doping)
2. Roads and industrial means pharmaceutical, chemical or other means that may alter the natural composition of urine, such as the use of a catheter to replace Paul properly in the bladder or to speed remove urine convicted the owner, or using drugs to cover the banned use of stimulants such as drug Albroobancisd diuretic and other means.

As you must know that there are special materials and drugs banned category all the time on the players, both during sports competitions or outside the times of those competitions. In the sense that they are prohibited on the player all the time, regardless of the season or competition times during his vacation or special times receiving treatment of injuries that pretext does not play during which a priori. The other category is prohibited only during sports competitions, it does not

prevent the player from abuse if he wants outside of those times. It is important that the body does not contain during sports competitions activities. And surprising in the medical community that the drug and hashish are in this category and are not within the category of prohibited substances on the players dealt with or abuse at all times. The fourth category of prohibited items in some types of sports games only, without other sports competitions collective or individual.

Accordingly, we have four main categories:

- Banned substances all the time
- Means banned all the time
- Materials and methods banned in sports competitions during the peak
- Banned substances during certain sports competitions
- Banned substances all the time elements of these prohibited items include

Firstly: Construction materials

It includes a list of more than 60 properties, and symbolized by ANABOLIC AGENTS ASS anabolic divided into two groups:

- The first group: Androgenic steroid and structural gene which is on the other two types:
the first: Steroid Androgenic and structural genetic Androgenic steroids of any that are made outside of the body.
Second: Steroid Foreign androgenic origin of any exogenous that are produced within the body by taking the player to certain chemicals.
- the second group: Other chemicals with structural effects in the body.

Second: Hormones and related materials

This group includes about 20 of the hormones Weems to b Hormones and related substances. It is divided into the following groups:

- * Activate the production of red blood cells of the hormone Erythropoietin (EPO)
- * Stimulate growth hormone Growth hormone (hGH)
- * Hormones for growth factors Meccano-like insulin Machaon Insulin-like growth factors
- * Lotions derived from platelets Platelet-derived preparations
- * The hormone insulin

There Hermann only men are prohibited:

- * Reproductive hormone placenta chorionic gonadotropin
- * The hormone Alloton to stimulate egg production Luteinizing Hormone

Third: Drugs Noahic group activated receptor beta

And all anabolic substances receptor beta is banned substances and even species used are very common in the medical center for the treatment of asthma! Symbolized by the Beta-2 agonists. Therefore, you must obtain a therapeutic use exception to the player drugs salbutamol and Salmeterol and Triptorelin and formoterol. And it allows players to abuse only through inhalation and sprays, for example, "Ventolin" with the famous blue packaging, containing salbutamol, permitted within the amount not exceeding 1600 micrograms per day, the amount of any therapeutic tight.

Fourthly: Drugs and antagonists of hormones

And symbolized by Hormone antagonists and modulators, which four sets of hormones and chemicals related to sex hormones and the male and female characteristics. The first group includes "aromatic inhibitors" for the production of the female hormone estrogen materials. The second group shall be called the material "described selective estrogen receptor" female. The third anti-estrogen drugs. And fourth articles "modified function" This group is one of the complex and advanced drugs in attempts to activate the body's capabilities.

Fifth: Diuretic drugs and sunscreens

And symbolized by Diuretics and masking agents, and these drugs increase the kidneys produce urine, and thus increased urination and remove water from the body. The athletes resort to it for the purposes of several. And it is suppressed for two reasons: The first reduces the amount of body weight during the competitions that require rapid scrambling and running, increasing the capabilities of the player compared to other. Second, it is working to increase the amount of urine, leading to easing the concentration of the presence of prohibited chemicals to be testing them in the urine. I.e., it reduces the concentration of those substances, which may deceive Viewfinder bodies of amphetamine. It includes ten types of diuretics available medical intake kits in pharmacies.

Means banned all the time and this group includes three types

Firstly: Promote the transfer of oxygen

And symbolized by ENHANCEMENT OF OXYGEN TRANSFER, and include two sets of tools that work result to activate and improve the level of blood and lungs ability to carry a larger amount of oxygen, and thus provide



Muscle oxygen, which helps to increase the strength and duration of endurance performance during physical exertion. The first group is the "activation of blood" using either the transfer of self-blood (AUTOLOGOUS), which is taken in the past of the player and saved to give him time last before for participating in sports competitions, and either transfer taken from another person, or the transfer of red blood cells, blood products whatever source. The second group includes the means of reinforcing synthetic processes oxygen absorption, transport and deliver it to the muscles. There is a long list of these means that there is no room for digression in the display. It is this group that play a role similar, drug Viagra, which increases the lung capacity to receive oxygen and blood supply to it. But this property today is not classified as taboo despite widespread abuse by players in international sports competitions.

Second: Physical-chemical treatment, and symbolized by M2

It means designed to manipulate the samples in order to change to the completeness and validity of the samples, including intravenous injection as well as any materials or liquids, unless there is an urgent therapeutic reason.

Third: Gene activation, and symbolized by M3

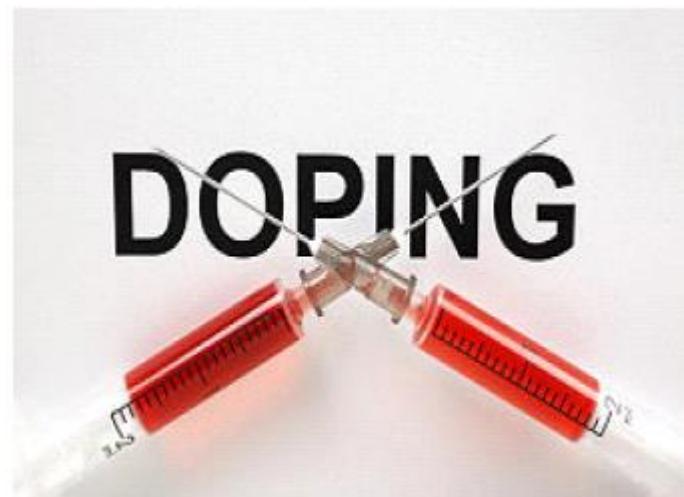
The players are prohibited from athletes at any time use of cells or genes or genetic elements, or to promote gene expression in order to enhance the capabilities of the players. This is a complex area of uses that are run by private laboratories and clinics to use cells or chemicals.

Materials and methods banned during the public sports competitions

This category includes four groups:

Firstly: Stimulants and steroids, symbolized by Stimulants, and prohibits the use of all stimulants and steroids, substances that cause direct alarm central nervous system, increase blood flow in the heart and the rest of the body, and increase the number of heartbeats. Excluded are very few materials of this group, such as caffeine found in coffee, tea, cola drinks and others. As well as there are controls for material "Adrenaline" when only the local use.

There is also a substance "ephedrine" and substance "methyl ephedrine" which are found in the anti-drugs congestion to treat colds. A substance that was detected in the former player Argentine



football Maradona. This article does not prohibit absolutely unless it observed an increase in the urine sample for the amount of 10 micro grams/ml. There are other limited exceptions that require a direct review of the list of drugs listed under this heading in the developed IAEA report mentioned.

Side effects of the use of steroids on the sports level:

The use of steroids leads to a positive impact on the elements of physical fitness and thus the level sports player if the such use as well as the training process, but this use has a positive side effect on the physical and functional aspects of another negative effect companion (side) symptoms adversely affect the health of the individual sports has been proven by experience that these disadvantages and side symptoms reached sometimes fairly sudden death, for example, if we assume that the individual sports players a high level in the sport of mathematics in which the level is determined by the force snapping Yeh, such as lifting weights throwing in athletics ... etc. deal certain doses of the fourth group of such stimulants, this leads to increased physiological section of the different groups of muscle, especially if the owner of this engagement special training muscle strength as increasing the size of the fiber while the number of fiber remains unchanged constant thereby increasing muscle strength, which was originally associated with increased distance in the case of the shooting and to increase the weight in the case of lifting weights.

It is worth mentioning here that this effect is also associated with another negative impact and side effects appear often like liver laceration kidney and intestinal disorders and respiratory diseases as well as this may lead to hair loss and sexual disorder. Use of steroids also result when young and young people sometimes to dysfunction hormones, endocrine hormones, and the rapid onset of symptoms of puberty before the specified time period.

- * The appearance of hair on her face and chest
- * As well as the use of male hormones for long periods and in large quantities leads to liver cancer
- * It leads to a deficiency in the secretion of the pituitary gland, which may lead to sexual dysfunction.
- * Injecting these types of steroids are also exposed to a clear increase in the proportion of cholesterol and fat in the blood, leading thus to increase the possibility of exposure to heart disease and circulatory system.

- * The process of using steroids from the first group lead to some mental and neurological diseases, some diseases of the digestive system.
- * Use this type to arterial hypertension as well as lead and sometimes lead to addiction.
- * The use of these steroids also results in the occurrence of some injuries) lacerations bone fractures).
- * Some of the symptoms of addiction that boils down to fear and confusion and anger and boiling as well as insomnia and lack of sleep and diarrhea as they appear.
- * For women, notes the emergence of symptoms of manhood have sound and shows it'll change the face of hair and changing physical style.
- * For young people and young people can use testicular hormones constructive process that will lead to a rapid build bone and thus in the palace construction period that do not take enough time thus leading to the early completion of the process of maturity and the occurrence of disabilities in length.

Damage Steroids:

Activated cause health damage to it that stimulates the body's functions and specifically activate the brain and central nervous system this activation generates attention and high mood and alertness and reduce appetite and increase movement but abuse is common among athletes for doping works to alert the central nervous system and can stimulants improve the body's ability to training and competition to the top levels as it reduces the feeling of fatigue associated with training.

Damage to muscle building drugs:

These vehicles have many sides the beginning of acne and even liver cancer symptoms, most symptoms can disappear with ingested stops but some permanent show research that more than 85% of drug users suffer from one or more of these side which include testicular atrophy and high symptoms blood pressure, which affects 34%.

Impact on sexual and reproductive functions:

Eating men of these compounds leads to low reproductive capacity, where leads to a decline in the pituitary gland responsible for stimulating the testicles to produce sperm, and lead to the inability to produce sperm and testicular atrophy, which may always be in many cases, while it can be cured in some cases.

The women decrease the size of the breast and less body fat and increase the growth of body hair as well as the sound changes and turbulence occur monthly cycle.

Impact on the musculoskeletal system:

It is known that the secretion of sex hormones start at the beginning of puberty leads to bone growth spurt and when these hormones reach the level of a certain limit bones stop growing, everyone remains on the maximum length according to the genetic qualities. And the use of structural redemptions leads to short stature if dealt with before puberty because they stopped the growth areas of the bones at an early stage.

Effects on blood fat:

Eating these compounds leads to a decrease in fat, high protein density and high level of protein in the low density of fat, leading to deposition of cholesterol in the blood vessels and atherosclerosis at an early age.

Impact on the heart and blood vessels:

The intake of these compounds leads to high blood pressure and lead to inflation in the heart muscle and coronary and exposure to blood clots in the heart or brain, even in athletes under thirty because of the hardening of the arteries and increase blood clots in the blood vessels due to the increase in the number of red blood cells, which may lead to sudden death in some cases.

Impact on the liver and skin:

Taking steroids structural and especially those taken from the mouth ways leads to a deterioration in liver function of elevated liver enzymes and bile occurs, as it may lead to liver benign or Kbut or composition of blood bags that may occur internal bleeding, acne, skin tumors hair and scalp in addition to early baldness for men and women.

Impact on behavior:

After studies have shown that these compounds, especially large doses lead to tension and violence, such as theft and quarreling, and that these effects are linked by eating steroids, some researchers have proven that the reason for such behavior is not the direct impact of steroids on the brain, but because drug users are affected by the media linking the abuse steroids and violence. It is also associated with the abuse of steroids and structural sense of self-love and the inability to communicate with others



Detection methods of doping

The disclosure of the abuse of athletes for doping is difficult because they need intensive and structured devices are complex and specialists experienced in this field effort initially tried to inspect athletes rooms or throwing a number of lectures on the disadvantages of steroids for the first time in 1968 Olympic Games in Mexico but now we have this science evolution so it became the discovery of drops ephedrine nose and after 48 hours of use.

The control of the use of activated needs a large number of specialists trained in this area to collect, record and transfer the samples to the laboratory and need another large group of chemists specialists to work in the lab 24 a day to see the results of the tests as soon as possible after the race and can be detected by doping means the following:

1. Analysis of lactation in a way photolysis and chromatography or radiation to detect the remnants of the effects of activated.
2. Blood analysis.
3. Analysis of saliva.
4. Analysis of hair follicles rider.

Prevention of doping:

The prevention of doping is essential before finding athlete himself addicted to it where he cannot abandon them, and it has all the big international bodies supervising carried on sports activities responsible for combating the phenomenon of doping and that through a series of seminars and international meetings in order to raise awareness movement danger addressed, as well as in the conduct of medical



and scientific methods that can be relied upon sports to improve the level of performance, it has been identified the most important and most of doping within the banned list by the Olympic Committee of Sports Medicine, and shed strict sanctions on athletes may amount to sports deprived competition Lifetime and impose significant financial penalties.

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