

# THE FUNDAMENTALS OF OLYMPIC PISTOL SHOOTING

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## INTRODUCTION



At the beginning of this course I would like to point out one very important fact. Namely, that all the elements of the position technique are strictly individual to the shooter. The description that follows is a general frame model that should be understood and applied accordingly to the shooters individual characteristics. Through daily work, feedback and experience, this model has to be adapted to the shooters best benefit, respecting all the requirements that follow.

Basic principles, described in this text, contain essential values that have been achieved through the work of many years and generations of successful shooters from all over the world. When adding all the experience and knowledge gained from the trainers that have been working with them, a long list of knowledge, research, scientific findings, education systems, experiences and suggestions that come from various experts from the fields of sport medicine, physiology, psychology, physical preparations, biomechanics, technical engineering and information science, one cannot doubt the great importance this text represents. These principles must be taken in account when building a foundation for the development and co-ordination of the individual characteristics of the shooter through the daily work.

When building a correct shooting position, all the aspects of the position have to be recognized - position of the feet, legs, torso, arms, hands, shoulders and head, as well as movements engaged in the lifting, sighting and triggering techniques. All these technical elements have one goal: maximum performance output.

To achieve the ultimate goal, a perfect shot, besides a "good eye" and "steady hand" (as the most primitive and raw definition described by ordinary "amateurs") it is necessary to meet a wide range of requirements to provide and secure the conditions for satisfactory shoot delivery. This will lead to the conclusion that the shooting position is one of the most important roles in building a successful shooter.

A simple fact, known to all, is that it is not possible to hold the pistol 100% still in the aiming area. This will lead to the conclusion that a smaller area of the movement will give better chance of scoring 10. Anyhow, we all know that sometimes the result is not satisfactory, despite the fact that the movement is as desired. A wide range of the factors can affect the score. In the majority of cases it will be due to the technical imperfection or psychological factors that are influencing the lack of co-ordination between the technical factors responsible for delivering a perfect shot.

### 2. Requirements - Precision Position

### 3. Stance - Precision Position

### 4. Body Position

### 5. Left Arm Position

6. Head Position
7. Right Hand Position
8. Sighting, Triggering & Aiming
9. Taking the Correct Shooting Position
10. Pulling the Trigger
11. Coordination between Triggering & Aiming
12. Finding the Final Sighting Area
13. Follow Through
14. Breathing

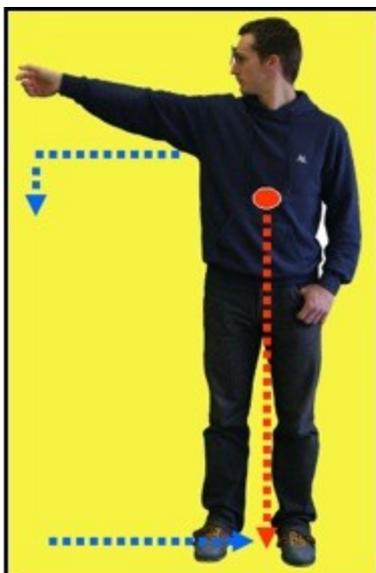
#### Requirements - Precision Position

There are 5 key aspects to be achieved in order to build a correct shooting position:

1. Natural/comfortable - allowing the shooter easily and naturally to obtain the position securing the maximum comfortable feeling during the entire shooting event.
2. Effective - demanding minimum effort in order to maintain an optimal position during the shooting even with maximum energy saving, preventing fatigue and securing optimal performance.
3. Stability - maximizing the ability to hold pistol with minimum arc of movement.
4. Alignment - ensuring that stability is beneficially used to point the aiming elements of the pistol into the centre of the aiming area, on the target.
5. Consistency - ability to take or re-take the position in a correct manner at any given moment and still maintain stability and alignment through the entire shooting event.

#### Stance - Precision Position

Building the shooting position must be done systematically and in order, taking in account all the requirements and keeping in mind the shooter's individual differences; anatomy, physiology, biomechanics specificity, strength and character.



Leg Position

The ultimate goal that the shooting position must provide is unconditional stability with minimum arc of movement. The basic of achieving this requirement begins with the position of the feet. Speaking in the terms of architecture it is like building a solid foundation for the static frame that will carry out the rest of the building that we are designing.

From here on all the parts of the body will be more or less conditionally directed by the parameters set from the foundation - position of the feet.

The most stable, and at the same time, most comfortable position is the one, where distance between the feet is approximately the width of the shoulders or just a bit narrower. The feet are placed in such way to provide minimum tension in the legs. To maintain the requirement that the shooting position should be natural, leads us to the conclusion that the feet must be naturally spread sideways.



Feet Position

As a result of such a feet position, the body will get a foundation surface in the shape of trapezium. This surface will have to provide projection space for situating the centre of gravity in its optimal position and space for the body weight distribution. This will lead to a position of the trapezium surface where the feet are spread in such way that the aiming line (eye, sighting elements, centre of the target) passes approximately through the middle of both feet or within 22 degrees. In order to meet the second requirement and minimize fatigue it is necessary to distribute the body weight in the middle part of the feet or slightly on the heels.

On shooting ranges all over the world it is possible to see many different variations from this model, ranging from 0 - 45° and still allowing shooters to perform with world top class results.

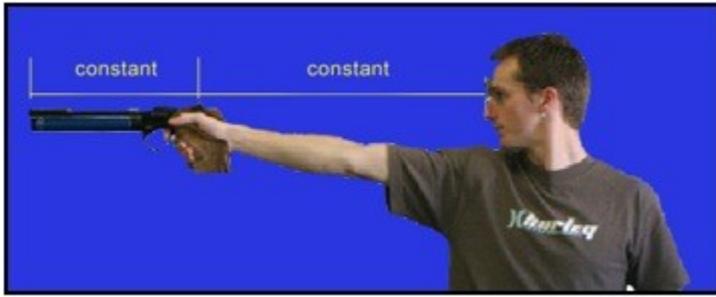
### Body Position

In the normal body position, without lifted gun, the centre of the gravity (COG) is naturally projected in the middle of the spread feet. When assuming the shooting position, with extended arm and holding the pistol, the distribution of the body weight (BW) and COG will change. The weight of the arm and pistol will dramatically disturb the body balance parameters. In order to regain position of the COG in the most optimal place and secure BW distribution on both legs, securing the minimum arc of movement of the pistol, it will be necessary to make certain body position adjustments. Bending backward (opposite of the target direction) the upper part of the body will provide counterweight to the weight of the extended arm with pistol. Additional movement of the right hip towards the target direction, or a little to the left, will provide extra effect securing the previous requirements (BW & COG). In this way BW is placed optimally on both legs, and the joints in them are stiffened. Body's COG is falling between feet or a bit closer to the left foot.

Without being unfair to the importance of the other many body parts and the work done by them, the right arm has one of the most important roles in the shooting process. The right arm has to provide the crucial minimum arc of movement of the pistol, bear the weight of the gun, secure the optimal sighting line condition and deal with recoil. This multi tasking cannot be performed successfully without the engagement and support that other parts of the body provide. In order to provide conditions optimal for those requirements, the right arm has to be totally stretched.

This position is necessary for three reasons:

- Distance between the eye and the aiming elements will always remain the same.

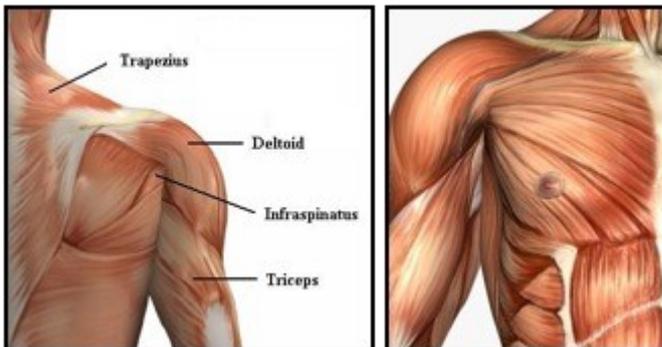


- Elbow, upper part of the arm and the shoulder build a compact unit with stronger connections.



- Stretched arm is better at absorbing recoil. This will result, consequently in increased precision.

To allow the right arm to perform best it is necessary to place it in the line that is passing through both shoulders or a bit to the left from that line. This way it provides the best conditions for the static work of all three parts of the deltoid muscle. This will result in the optimal placement of the right shoulder in the lower or middle high position. Very often, we can see the high position of the shoulder and this model will be elaborated in the study case.

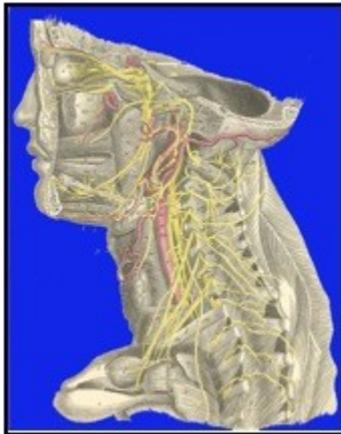


#### Left Arm Position



The shooting position in pistol shooting demands that the left hand and shoulder have an absolutely passive role. Such a role is determined by the fact that we need to produce as many constants as possible in the shooting position and process of firing the shot. By placing the left hand in the pocket or attaching it to the trouser belt, the left arm will keep the same place at each shot process. This will result with a more compact unit arm - shoulder - body, and will increase the body's balance. The projection of the COG will be aided in moving to an optimal desired area. Such a position will be the closest one to the "immobilizing position". i.e. "anatomic passive position".

### Head Position



Blood Circulation System

An average head weighs about 5 kg and requires very delicate attention in terms of its positioning and control of movement. The position of the head, more than any other part of the body, should provide for a natural and comfortable condition for the shooter.

This demand is dictated by the function of the eyes and balance centre situated in the vestibular system. A very delicate network of many nerves leaving the spinal cord and connecting CNS with peripheral body parts, should be additional demand.

Full attention must be taken in account concerning that blood circulation system that supplies the brain, eyes, ears etc.

The head is turned to the right without deviation in any direction, providing the following benefits:

- optimal conditions for the eyes sighting function, optimal conditions for the function of the vestibule mechanism
- optimal condition for the blood flow
- optimal condition for the neck muscles, preventing unnecessary fatigue



## Right Hand Position

Top level shooters say that a correct grip hold is half way to a successful shooting. That is correct!

All that mentioned above is with the purpose of providing a hold of the pistol with minimum arc of movement in the middle of the aiming area, with consistency and the minimum use of energy. Despite all these requirements being fulfilled, the final and most precious part of the shooting position belongs to the correct placement of the right hand on the correctly built pistol grip.

The position of the right hand has a major role in correct holding of the weapon. There are three important points on the hand and on the grip that must be considered:

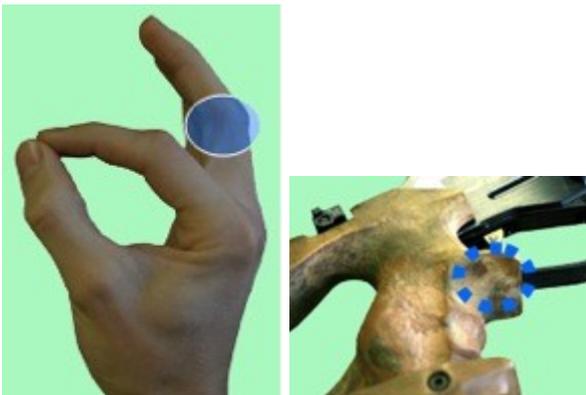
- space between thumb and index (trigger) finger - behind barrel and under the rear sight.



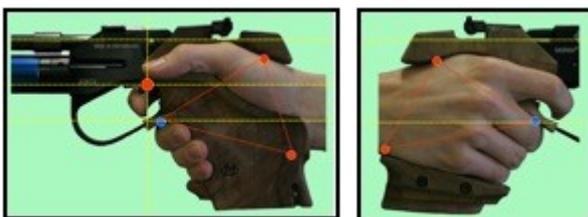
- down part of the hand, next to the wrist ankle (art. ulnaris) - upper (supportive) part of the grip.



- upper part of the middle joint of the middle finger on which is laying grip's part under the trigger mechanism.

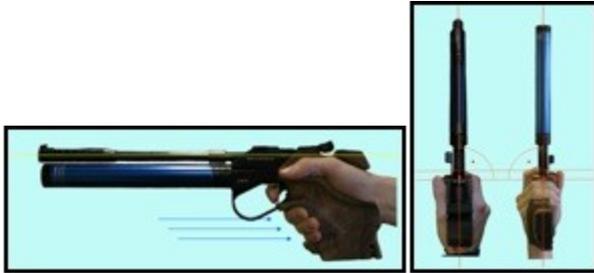


When these three points of the hand are correctly placed on the appointed places on the grip, they will form a triangle.



The best place to hold the gun is at its construction COG (left photo - red dot), but for obvious reasons it is not possible. Therefore, we are trying to get as closer as it is physically possible to this mark by supporting it at point two (blue dot), as a centre of the triangle hold.

This technique of gripping results in the use of the law of the lever. Such approach will give possibility to hold the gun with minimum muscle activity, saving energy and minimizing arc of the movement of the pistol.



When, applying pressure on the grip, it is essentially important in doing so that there are no lateral forces. All pressure forces must be done in parallel with barrel and in 90° axis of the barrel.

Three fingers, little, ring and middle finger, are banded around the grip with nice, smooth tension which is always the same and pressure on the grip is with the middle phalanges of the fingers. Any other deployment of the forces will result with lateral deviations of the axis of the barrel.

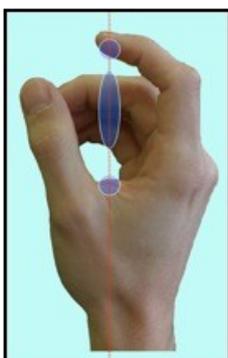


The most important finger of the hand, trigger finger, must be free of any contact with the grip. Only in this way are there optimal conditions for the correct activity of the trigger finger and correct triggering action. If this is not the case i.e., trigger finger has contact with the grip, every attempt of triggering will result in movement of the pistol from the optimal sighting point, and precision will be decreased.



Last, phalanges of the thumb - little - middle - ring finger, can have contact with the grip, but without any significant pressure.

Finally, here is the photo showing points of pressure and transfer points of the forces allowed during gripping technique.



## Sighting, Triggering & Aiming

Many times it has been said that for good shooting it is necessary to have a good eye (and quiet hand). If one looks on the international stage, it can be really surprising to see how many shooters wear glasses. For good shooting it is essential to have a correct sighting technique and clear vision (with or without glasses). One of the most used is described as followed:

The front sight must lie in the middle space of the rear sight. Upper line of the front sight must be in the same horizontal line (level) with the upper line of the rear sight. From the both sides of the front sight must be the same free space from two inner sides of the rear sight.

This complex of the front and rear sight must be appointed in the middle down part of the "bull eye", on the target, within that between sights and the "bull eye" is "free space" (with line) i.e., front sight is pointing approximately on ring nr. 5. This "free space" is necessary because only on that way it is possible to make corrections in the sighting process.

The focus of the eyes is always on the front sight. There you will find the greatest movements of the barrel and the most recognizable. Many shooters make the mistake of focusing on the target; in that way they get the illusion of less weapon movements which is resulting with sufficient precision.

All the above mentioned elements have to be used in a coordinated and systematic way; otherwise there will be no expected and wished for output. Five important coordination elements are to be taken in consideration for the proper use of the above mentioned position technique.

- Taking correct shooting position
- Pulling the trigger
- Co-ordination between triggering and aiming
- Follow through
- Breathing

### Taking the Correct Shooting Position

The question is often asked - how to take correct position? Here we will suggest a method with closed eyes.

The shooter is standing two meters from the shooting stand, looking straight into the target. After few seconds, walking forward, coming to the shooting line, the shooter will turn to the left as long as he can comfortably see the target (i.e., without feeling tension in the neck muscles).

After this, place both hands (holding each other) on the front part of the stomach, and close the eyes. Try to feel pleasant and comfortable with the body balance. When this is satisfactory done, lift the right arm in to the direction of the target, and hang your left hand on the pants belt (or hold in the pocket).

Few seconds later, turn head in to the direction of the target, open eyes and see where is pointing hand spot between the thumb and trigger finger; it should point into the "bull eye".

If this is not the case, the procedure should be repeated until mentioned hand spot is placed approximately on the visual area of the "bull eye", within that comfortable feeling and body balance remain.

For the smaller deviations there are other methods to correct position. In the case of small side-wide deviation (size of the target), left foot is going to be discretely moved in opposed direction i.e., if mentioned hand spot is pointing to the right - left foot should be moved to the left - forward, and in situation when hand spot is pointing to the left, correction will be done in opposed direction.

When this part is done, without moving from the position, the shooter is taking the pistol into the hand and lifting it some 20 times, in order to get the right feeling.

### Pulling the Trigger

Fulfilling a few simple rules can make shooting easy and enjoyable.

Trigger finger must be free of any contact with grip; otherwise every movement during triggering will result in movements of the weapon which again will result with bad precision.

First joint of the triggering finger is placed with its most sensitive part; centre of the finger prints lines, on the middle part of the “trigger shoe”, in 90 degrees to the axis of the barrel.

When triggering begins, pressure must be exerted parallel with barrel axis. Once started, the procedure, should be with slowly, softy, consistent pressure, so that the shot is coming as a surprise.

It is absolutely “forbidden” to have any hesitation in the triggering action or rapid, violent movements with the trigger finger, otherwise it will influent negatively on precision.

### Coordination between Triggering & Aiming

It is beyond any doubt that the technique of pulling the trigger during sighting is the most sensitive and most important part in successful pistol shooting.

Theoretically, the technique is very simple, but in reality there are difficulties. Therefore, correct explanation and correct training are of essential importance.

Air pistol trigger mechanism is a mechanism with accelerator. It means that there are three stages. “First leg” until trigger stop, trigger stop and “second leg”.

### How to coordinate Triggering & Aiming

There are two major sighting techniques; one where gun is lifted up to the “bull eye” and one where sighting elements are being brought over the “bull eye” and then slowly returned in the final sighting area. For the easier understanding I will call them “upper” (UT) and “lower technique” (LT).

When coming in rough sighting area, the shooter is pulling “first leg”. In the UT it is above “bull eye”, and should be lowered in the final sighting area; in the LT it is closer to the final area and gun should be brought just a little bit higher.

### Finding the Final Sighting Area

The moment when trigger stop is reached, eyes are maximally focused on the front sight.

Continuing pulling the “second leg”, ignoring slight movements of the pistol, until the shoot is delivered surprisingly.

Hold the trigger in the “back position” and keep “follow through” for about 2-3 seconds.

On this way all possible conditions for a “perfect shoot” are recognized:

There will be no rapid movements of the pistol - good precision,

Sighting technique will be intact - proper sighting area and,

Opportunity for analytic process will exist - “follow through”.

Unfortunately, many shooters are doing this part of the shooting in a wrong way. Coming into the sighting area, they are trying to make movements of the weapon perfectly quiet (it is impossible); forgetting to

work “through the first leg” stage and pulling the trigger violently, causing rapid movements of the pistol in the most important moment of the shoot delivery.

### Follow Through

There is no doubt that, after the shot has been delivered gun and the shooters concentration has to remain for the next 2-3 seconds. In this way is secured that mental part of shot delivery is still remaining with positive energetic balance i.e., shot is not delivered with last atoms of the concentration. Also on this way is the only possibility that neuro-muscular system and conscious part of brain are getting necessary and vital feed-back experience.

### Breathing

It is well known that at least during the final sighting process it is not good to breath, because breathing is connected with rhythmical movements of thorax, abdomen, shoulder system and is resulting with weapon movements that are negatively influencing on precision. Therefore it is recommended to make certain breathing stops during firing the shoot. It is necessary to recognize breathing as physiological process that is permanently happening in the organism, and is connected with blood flow, distribution of the oxygen and carbon-dioxide, metabolism and complex reaction in the central nervous system. All these processes have an important role in the organism’s correct functioning. Therefore breathing has to have an important role in micro, as well macro cycles during shooting stadiums. Wrong breathing technique can and will negatively influence the general condition of the shooter and will result in a bad shooting result.

During normal breathing person is making 12-15 breathing cycles in the minute. That means that one cycle (inhaling, exhaling and breathing pause) lasts 4-5 seconds.

What is interesting from the shooters point of view is that we can, without any special effort, extend the breathing pause for about 12-15 seconds and without any serious physiological problems. This time is more than enough to execute a correct shoot. Experienced shooters, before shooting single shot, usually are taking 2-3 deep breaths and then slowly and incompletely exhaling, before stopping the breathing process in order to fire shot in optimally quiet conditions.

Second technique that is also very often used is to stop breathing after deep inhaling. Logic is that in that way blood is the most concentrated with oxygen, and hunger for the air is smallest.

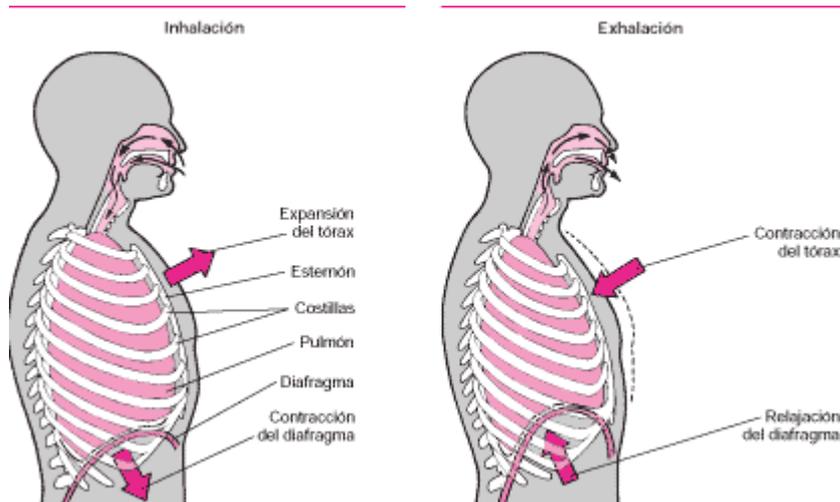
Anyway to prevent fatigue and side effects during long competition and many times disturbed normal breathing process it is necessary to advise shooter not to make breathing pause longer than 7 seconds. Before starting next shoot process it is necessary to take few deep breaths in order to release residual quantity of carbon-dioxide and take necessary quantum of oxygen. This technique should be applied during all shooting exercise/match.

Whichever technique shooter is using it should be to support and extend his optimal working abilities during whole shooting. Breathing technique is strictly individual process and has to be developed by personal experience.

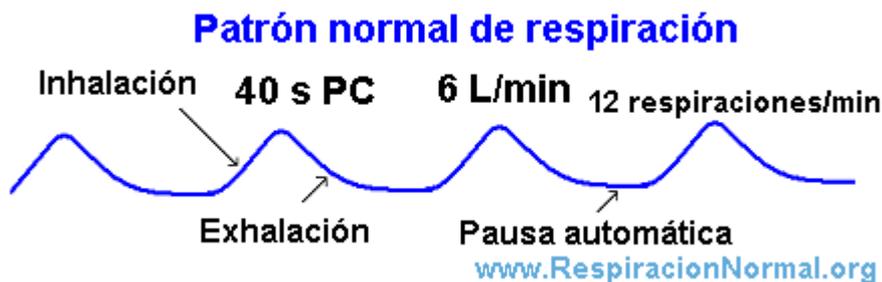
Many different and controversial opinions and techniques were subject of discussions among trainers and shooters.

After my opinion and experience any technique that is providing shooter with necessary flow of oxygen is correct one. That is one of the most individual elements in shooting and all of them are probably correct. Let’s not forget that breathing is one of the first automatic reflexes that every one of us is born with. It is part of our nature.

### Respiración



Es bien sabido que al menos durante el proceso de puntería final que no es bueno respirar, porque la respiración está conectado con los movimientos rítmicos de tórax, abdomen, sistema de hombro y resulta en movimientos del arma que influyen negativamente en la precisión. Por lo tanto, se recomienda tomar ciertas pausas respiratorias durante el disparo. Es necesario reconocer la respiración como proceso fisiológico que está sucediendo de forma permanente en el organismo, y está conectado con el flujo sanguíneo, la distribución del oxígeno y dióxido de carbono, el metabolismo y la reacción compleja en el sistema nervioso central. Todos estos procesos tienen un papel importante en el funcionamiento correcto del organismo. Por lo tanto la respiración tiene que tener un papel importante en los ciclos micro, así como en ciclos macro durante las pausas de tiro. Técnica de respiración incorrecto puede y va a influir negativamente en la condición general del tirador y dará lugar a un mal resultado en el tiro.



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## La respiración en el deporte

4

Salud

12 agosto, 2013

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**El control y la mejora del proceso respiratorio es fundamental para las personas, tanto en el ámbito de la salud, como en el de la práctica deportiva.**

La respiración es uno de los procesos más olvidados en muchas actividades relacionadas con el deporte, pero no por ello es menos importante. Por respiración se entiende el proceso por el que entra **oxígeno** a nuestro organismo y sale **dióxido de carbono** del mismo.

### **El proceso de respiración**

El aire entra en los pulmones donde se produce el intercambio gaseoso entre alvéolos y glóbulos rojos. Cuanto **más entrenados estemos, más rápida será esta difusión**. Es una de las adaptaciones fisiológicas que produce el entrenamiento en nuestro organismo. Cuando la sangre oxigenada llega al corazón, éste la bombea para que llegue a órganos y músculos activos. Con el ejercicio el músculo cardiaco también aumenta de tamaño y capacidad, mejorando la eyección de sangre.

Nuestros pulmones se llenan y vacían de aire como consecuencia del movimiento de