

## The Vital Problems of Pistol Shooting Part 1

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### The Vital Problems of Pistol Shooting Part 2

I would like to draw the attention of my colleagues, coaches and shooters to a problem that concerns practically all shooters. This problem is the last stage of the shot, aiming and the action of the trigger.

From the biomechanical point of view, this action is quite simple. Then, why is it so difficult to carry out?

It is commonly known that the impact of bad shots is always in the upper-right or lower-left zone of the target (for right-handed shooters). This phenomenon is always the result of the movement of the wrist when shooting. This movement is applying lateral speed to the bullet. The deviation distance of the bullets depends on the speed of the movement. If the pistol is kept steady when shooting, there is no deviation and it is obvious that it is best to shoot in that instant.

Let's study the reason for the movements of the wrist in that moment when it is necessary to have maximum stability. The shooter wants to shoot in the moment when the real image and the ideal image of the aim coincide. This coincidence occurs several times, but always for brief instants. The shooter wants to take advantage of these instants, he/she has to pull the trigger very quickly, producing the movements of the wrist; these are produced because the independent movement of the index finger is quite a difficult process.

Let's analyse if the ideal aim is indispensable in the process of shooting a pistol.

Stability, even in the best of shooters, is never ideal. The «shooter-weapon» system is not firm, there are always oscillations. So, talking about a precise shot with a pistol puts the shooter in a situation which is not always solved in a positive manner. The perfect shot with a pistol requires the coincidence of several random factors. It would be better to speak about a compromise shot, a compromise between the need to make a perfect shot and the impossibility of keeping the pistol completely steady.

There are two solutions to this problem. The first, which is being used by many shooters, is to «hunt» for the ideal aim. When the ideal aim appears, the shooter increases the pressure on the trigger in order to shoot dead center. This wish to shoot dead center is the reason for the movement of the wrist, the breadth of which depends on the shooter's experience and skill.

The second is the classic aiming scheme, a process which seems simple but is quite the opposite. I am completely convinced that the process of aiming does not exist, or rather, is not possible to carry out in every shot. It is a casual process and this opinion has been confirmed in conversations with colleagues and in practice.

For me, aim and stability are one and the same thing. The best shooter is a vise – if we steady the pistol in a vise, the problem of aiming disappears. The shooter must turn into a vise, but this is not possible and we go back to the idea of compromise.

The breadth of the oscillations of the pistol during a shot, the arc of the movements, is an individual characteristic of each shooter. It is quite constant and remains so for a long time, even when not training. The arc of the movements (AM) can be a shooter's certificate of quality. If your AM is the size of a size «8» circle, don't think of obtaining only a «10». First you must reduce your AM, but it so happens that reducing the AM is much easier than actually taking advantage of this improvement.

The shooter has to know his AM limitations very well and his ambitions cannot be that much higher. Only the quiet and sure shot within his/her AM can guarantee the absence of very bad shots, those that «swallow» your hard-earned tens.

There is an idea possibility by which one can record and observe this characteristic: the SCATT computerized systems for training, designed in the Soviet Union and produced in Russia. This system allows one to observe that the stability of most of the shooters with 2-3 years' experience is almost always found in the 9.5 circle in the moments prior to a shot. This means that the shooter, shooting without any movements of the wrist, is going to shoot within this circle. The same SCATT confirms that mid-level shooters have an average stability within the «10» zone during the last second prior to a shot of 60-75%. Theoretically, then, shooting with an air pistol, these shooters can obtain results of 576 to 585 (men) and 376 to 380 (women), which much higher possibilities for elite shooters. The 85% stability can yield results of 590 and 394 respectively. I know shooters who have a stability of over 85%, but they do not obtain higher results. In the «Time Shift» graph by SCATT we can see that the shooter would obtain the maximum result if he/she shot 0.1 – 0.3 second faster. This, however, is not true because the shooter will still make the same mistake, regardless of this gain in speed.

I see the solution to this problem as a change in the shooting pattern, as a change in the shooter's objective in the shooting process.

The objective of the shooter should be the conservation of maximum stability during the time that is needed for the action in the trigger and a bit more. The shooter should be certain that, during this time, the pistol is not going to leave the shooting zone, he/she must trust his/her stability, which is always better than it seems.

With the help of an armourer, each coach can prepare and carry out a very effective and efficient experiment. In order to do so, one needs to adapt the remote control cable of a photographic camera to press the trigger. The shooter is keeping the pistol within the shooting zone and the coach, without looking at the image of the aim, is shooting. This yields surprising results in every case. It confirms that our number one problem is not aiming, but the movements of the wrist.

Below one can see the diagram of the actions during the shot. You must divide the whole process into two parts that are related to each other and of equal importance: preparation and execution (the shot itself). The preparation is often ignored by the shooters, but it is the foundation of a very delicate process: the shot.

#### **I. Thre preparation phase for the shot.**

1. When he raises the pistol a bit above the target, the shooter is making a mental tour of the most important points regarding posture:
  - Ankles;
  - Knees;
  - Lumbar zone;
  - Shoulder;
  - Wrist.
2. When he/she fixes his habitual muscular tone, the shooter is concluding «I am ready to go!» and lowers the pistol to the shooting zone, accompanying this movement with a full exhalation.  
Note: The exhalation gives a feeling of calm and security as a conditioned reflex.  
Remember – when we are suddenly faced with danger: «Ah!» – inhaling; the danger passes – «Phoo...» exhaling.

#### **II. The execution phase for the shot.**

After lowering the pistol to the shooting zone, the shooter begins the movement of the index finger – slow but firm. This movement is almost independent of the shooter's will. Imagine that you have a fuse pistol in your hands, which has no moving parts and only the fire moves in the fuse. You only have to keep the pistol in the shooting zone and, as a very good shooter once said, «keep a stony face» as you wait for the pistol to shoot.

I know it is very difficult to keep totally indifferent to the position of the sights in relation to the target, but it is worth the effort because the aiming errors are always much smaller than those made by the movement of the wrist.

We will discuss a problem that, in my opinion, should be solved very differently from the way described in most books. The problem is aiming and the action of the trigger. These two actions are impossible to separate one from the other – they are, indeed, a single action, although many books deal with these two elements in separate articles.

We can divide shooters into two groups who are aiming and activating the trigger in very different ways. We'll call one group «passive» and the other «active». The passive ones are concentrating on searching for the perfect aim, waiting for the sights to be in the ideal position for the shot. Many of them, with years of training and good motor skills, can do this almost perfectly, but not in every shot. The active ones are concentrating on the actions which they can influence – the movement of the index finger, the conservation of the muscle tone of the wrist, and the position of the post in the groove of the rear sight. It would be good if the shooter would only worry about «inner» problems, those happening within his body; these are much more important than «outer» problems.

I am convinced that the main objective of the safe shot is not the shot itself, but the keeping stability and muscle tone constant. In order to do this, the shooter must create a new shooting scheme; stop thinking about aiming as an emotional process, putting everything on a mathematical footing, turn into a shooting operator.

For example: air pistol, 10 meters, initial speed of the pellet 150m/sec. The pellet will reach the target in approximately 0.1 sec. If, when shooting, the tip of the barrel has a lateral speed of 0.2 – 0.3 m/sec., which can be triggered only by the movement of the wrist, the pellet is diverted 2 – 3 cm from the shooting point, for about an «8» or a «7».

The speed of the movement of the tip of the barrel caused by the movement of the wrist can be greater than mentioned above and is always greater than that of the movement of the arm. We all know basic mathematics examples on angular and parallel errors. These are true only for rifle shooting with an open sight and support, that is, for a weapon that does not move, which is not the case of the pistol.

Certainly, these errors exist, but they are not the result of bad aim, but the product of bad stability that is not controlled by the shooter. The pistol is always moving during a

shot, the breadth depends on the level of the shooter. The trajectory of these movements often crosses the ideal shooting point, and if the shooter is going to try to shoot at this apparently less-than-ideal moment, the bullet always lands far from the centre. Why? Our sight works in such a way that we are always looking at what already happened, especially if it's a moving target. When «hunting» for the ideal aim, the shooter is shooting at a duck that is already gone.

There are very tricky people who are capable of «hunting» this way successfully, but their results are not consistent. I will try to explain my understanding of the safe shot, a way of shooting that can be dominated not only by tricky people.

The shooting scheme presented above contains nothing which is not already known. My proposal deals only with the contents, without changing the form. I want to highlight, once again, the importance of the preparation phase of the shot which some shooters are ignoring. Let's compare the shooting of a pistol with rifle shooting while standing.

These two shots have a lot in common. In recent years, results in rifle shooting while standing are always growing, while those for pistol shooting are descending. Let's see how rifle and pistol shooters are preparing their shots. The best rifle shooters are using up to 60 seconds for the preparation phase, and about 3-5 for the execution. Most pistol shooters start aiming without controlling posture, without fixing habitual muscle tone at the most important points. When aiming, the shooter cannot fix the pistol at that position and the «active» actions, such as pulling the trigger, almost always disturb this very fragile balance. What is the solution?

First, forget aiming as an independent process, let the trigger action be your priority. Second, trust your stability, which is always better than it seems. You can confirm this in SCATT, otherwise you can take my word for it.

Third, when lowering the pistol to the Shooting zone, start the movement of the index finger, without interrupting it until you release the shot, and then a little more.

Fourth, our objective is keeping the wrist as still as possible and not allowing any other movements to occur other than the arc of movement.

**Fixing the wrist – training without a weapon.**

This is the weakest point of all pistol shooter. The sooner the beginner, with the help of his/her coach, learns to dominate this difficult action, the fewer problems he/she will have in the future.

This action is difficult for one reason: the muscles, responsible for fixing the wrist, are not controlled by the central nervous system (CNS). This is why an untrained person cannot fix the wrist without putting pressure on the fingers. Since the isolated fixation of the wrist is not necessary in everyday life, the nervous connections between the CNS and the wrist are almost non-existent. It is only possible to recover them with very specific, long-term training. This training is possible not only with weapons, but in any situation where one's hands are free: while watching television, riding on a bus, talking to friends, etc. It is necessary to hold something similar to a grip while trying to fix the wrist without putting too much pressure on the fingers or controlling the degree of fixation with the opposite hand. Imagine we are holding a very heavy egg with a very fragile shell – we cannot grip too hard or relax our fingers. At the same time, we must make the movements of the index finger very slow, but very firm, making sure they are not changing the muscle tone of the wrist.

#### **Fixing the wrist – training with a weapon.**

- Double shots with a standard pistol. The first shot is used to create the base, the muscle tone «after the shot». When memorizing the muscle tone, the shooter is making a second shot.
- «Double» shots with an air or free pistol. The same exercise as above, but the first shot is imaginary. The shooter must create the muscle tone «after the shot» with muscle memory and the force of his/her imagination.
- The 20-sec. series with a standard pistol. This exercise is very useful; it is the golden key to all pistol disciplines. Twenty seconds is enough time, there is no need to rush; but it is not enough time to do a lot of aiming. If one does not know how to fix the wrist, it is not possible to do this exercise correctly. It is better not to use the shorter 10-second series, at least during the initial training phase. Shooting with a greater time limit does not help the shooter improve his/her technique, but can give him/her time to acquire bad habits (movements of the wrist).

#### **Kindergarten.**

I used this method for training for the first time in Portugal in 1995, where I coached not only shooters but also modern pentathlon athletes who were like a blank sheet – none of them had ever fired a shot before.

It is necessary to do a lot of individual work, but, as always, we had no time. When I was working with one, the rest were on their own.

I decided to use a tape recorder – I taped the successive performance during a series of 10 shots. Now the shooters could follow my voice and, at the same time, I could control and assist any of them without interrupting the process.

After three months of training, the kids won at the European Modern Pentathlon Championship. Soon afterwards, at the World Championship, the Portuguese athletes won individual second places in shooting, both men and women.

Currently, his training method has been modified a bit, but the content is practically the same. The name was applied in El Salvador, where these German words are used.

I am using a 90-minute tape with a recording of the series of 11-12 shots at a pace of 1 shot – 1 minute, after a rest of 3 minutes. In the initial training phase with the Kindergarten method, one uses the recording with the 20-second preparation stage of the shot and the 10-second execution stage (5 seconds – the shot and 5 seconds – the conservation of the same state). For 30 seconds of rest between shots, one hear classical music, such as that of Richard Claydermann, for example.

Once the rhythm has been dominated, the shooters can go on to the next level, where both the preparation and executions stages last 15 seconds each, but the shooting time is the same – 5 seconds, and only the time after the shot is longer.

Using the Kindergarten method, the shooters with years of experience can stabilize and even improve their results, as well as solve the problem of lack of time in competitions, but this method is very efficient for beginning shooters.

One shooter from El Salvador, L.M., who in May 2002 had been training for only 3 1/2 years, but always used the Kindergarten method, has shot twice in World Cup finals. This example is, let's say, extreme, but I have proof that shooters who train with this method are improving their results, almost automatically, and supposedly without any effort on their part.

Some shooters with experience and successes in their career are sometimes afraid, in my rightly so, of changing their training habits because they can lose what they've gained, without any guarantee of gaining anything better. It's worth a try to start and the first two or three training sessions will dispel any such doubts.

Last of all, I would like to point out that the main weapon of any shooter who is dreaming of international-level results is patience. Experienced shooters must be aware that they will have more problems than beginners because changing the

habitual succession of their actions and the succession and content of their thoughts is more difficult than learning something new.

You can be sure that once you've learned this technique, that is, if your objective during a shot is the conservation of maximum stability, of muscle tone and attitude, you will understand more clearly what a shot it and you will never lose this quality.

#### **Shooting rapid stage in women's sports pistol and men's central fire pistol.**

Any shooter and coach knows that in this disciplines, the ones who win are those who know how to shoot better in the second part – rapid shooting. The case of Tao Luna in Sydney is a good example. She had 299 points in the first part of the competition and did not win because in the rapid stage she shot only 291 points, she even got a «7» in the last series. After Sydney, the importance of rapid shooting grew because currently the final series is fast. Another example from a World Championship is from Lahti 2002, where Dorjsuren Munkhbayar was in sixth place after the first part of the competition, along with three other shooters, 4 points away from first place, but in rapid shooting she lost only 3 points and went into the final first with a 2-point advantage and won the Championship.

Of course, psychological preparation is also very important, but who can doubt the psychological stability of Tao Luna?

We know that there are shooters who are better at rapid fire shooting, and others who feel more secure shooting without a time limit. There are very few know how to do both equally well. We also know that training can change and improve athletes' natural talents.

Below you will read a description of the technique of rapid shooting as I understand it. I am not going to discuss positions or grips – these are not important now.

Shooting without a time limit is done by almost every shooter in the out breath, although in some books it is possible to find recommendations for doing it at the beginning of the in breath. I am sure that the authors of these books are speaking theoretically and do not know the actual practice of shooting, also considering that these recommendations are 30 to 40 years old.

We are doing the shooting without a time limit during the out breath stage. What about the rapid fire shooting?

The following happens in rapid fire shooting: by habit you raise the arms to breathe in, also raising the pistol as a logical consequence. But muscle tone after breathing in is very different here from shooting without a time limit. This is why I am recommending breathing in the opposite fashion – raising the pistol when breathing out (conditional reflex – calmness).

This change is learned very quickly during training. In the «ready» position, 1-1.5 seconds before the target appears, breathe deeply and, when the target appears, start raising the pistol and breathing out. In the intervals between the appearances of the target, breathe twice normally, then a deeper breath and wait for the movement of the target. Raise the arm calmly, with steady speed, no accelerations at the start or decelerations at the end.

Now, let's discuss the index finger. In the «ready» position, the index finger must be in contact with the trigger without exerting any pressure on it. Once you begin raising the pistol, the index finger also begins to move, and this movement stops with the exhalation, when the pistol stops. The shot must be made at the moment when the pistol stops or few instants later. No matter where you are at the time, in the centre or outside. The shooter cannot look for the centre of the target; this works with long-distance shots, because when a shooter wastes time looking for the centre, he/she must speed up the shot, which almost always makes the wrist move. In order to avoid this waste, you must train a lot in raising the pistol. Lack of precision in raising, even in mid-level shooters, almost never produce anything outside the «9» circle, but moving the wrist can produce a «0».

The work of the index finger, which I recommend, is learned more easily and safely than that which is made with difficulty prior to raising. The authors of some books speak of the necessity to get rid of 70 to 80% of the weight of the trigger in the «ready» position. In this case, after raising the pistol, the index finger is blocked by the shooter's fear of shooting prematurely. Starting the movement of the blocked finger is very difficult, almost impossible without losing the stability and fixation of the wrist.

The movement that I recommend is broader, which is easier to do than narrower movements. Try it and you will quickly become convinced of the efficacy of this technique for pulling the trigger.

A historic anecdote before I sign off:

Niels Bohr, the Nobel Laureate, was walking with his students in the country one day.

A young man raised a stone, threw it and hit a post at about 40 meters. Niels Bohr, being the genius that he was, generalized this particular case. He said: «Aiming at such a distant object and hitting it is, of course, impossible. But if we throw the stone in the right direction, imagining the absurd possibility of hitting the object, we will probably succeed. In this case, the certainty that this can happen is more important than training and good intentions.»

I would like to read the opinions of my colleagues on the methods and techniques I explained in my article, but not before 2 or 3 months, agreed?

Good shooting!