

Assessment of the Shooting Posture

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At the recent PATS camp held at the AIS in Canberra, I spent some time working with shooters and assessed their individual shooting posture. The aim was to determine whether the shooters had made any progress since my first assessment and to assess new members to the squad.

As I have discussed in previous articles, the shooting posture is reliant on good fitness and physical condition. In addition, this posture facilitates dominant patterns of movement because the pistol is only used on one side of the body and this can create long term problems with respect to balance, strength, stability, and flexibility.

I have adopted the following procedure when dealing with shooters.

1. Discuss any issues regarding pain, movement, injury or performance that the shooter may be experiencing.
2. Assess the normal posture with respect to imbalances in muscle development, skeletal position and range of movement around key joints.
3. Assess the shooting posture with an understanding of how the static postural issues may have been caused by or may lead to changes.
4. Assist the shooter with correcting these imbalances by using stretching and strengthening exercises.

After working with the PATS squad for the last few years, I have noticed a range of issues that are repeated and lead to poor shooting posture, lack of strength in the shooting posture and adjustments to joint angles that exert undue stress onto postural patterns.

The key issues that I have noticed include:

- Alignment of the shooting arm and shoulder as an ideal angle
- Elbow and wrist angles in relation to the shoulder position
- Upper body posture and position of the spine above the hips
- Head position in relation to the sight and the target
- Feet position in relation to the upper body and target

Looking at the matters in more detail, I will attempt to explain the ideal postural position and the way in which shooters tend to adjust this so as to achieve what they believe to be the best shooting position.

Alignment of the shooting arm and shoulder as an ideal angle

In previous issues I discussed the angle that is optimal for the arm to be positioned in relation to the shoulder. The shoulder sits at a natural angle of 25-30 degrees compared to the line between the two shoulders. If the shooter raises the shooting arm completely sideways it means that the shoulder joint is not sitting in its natural middle position.

For the shoulder joint to be positioned in its absolute middle position the arm must also be raised in a 25-30 degree forward position to allow optimal muscle and joint tension that creates a balanced middle position for the shooting arm. This position also allows the head to rotate only part of the way to the side and still remain behind the sight of the pistol without having to lean over.

The types of problems that occur as a result of this angle being incorrect include:

- Loss of ability to absorb the force of recoil through key muscles and joint structure. This means that in all likelihood other associated muscles will have to absorb the force and do the work and, in many cases, this leads to injuries related to over use, joint stress and pain.
- Shoulder muscles have very specific functions and work best in very specific ranges of movement. If the muscle is required to move or hold a position far beyond its range, it will not perform that task to its full ability. This means that the task of holding the shoulder and arm in the ideal shooting position may not be achieved by the muscles best suited to that task. As a result, these muscles may be overused or in spasm to protect the joint and its position.
- As the body requires a series of complex movements to achieve an action, it follows that once one aspect of the shooting arm position has changed other changes will occur to allow the shooter to get into the required shooting position.

Elbow and wrist angles in relation to the shooters grip

Many shooters found it hard to achieve the same alignment through both the wrist and the elbow. In essence the wrist should be held so that the line of the forearm lines up with the knuckle of the second finger. If the wrist is allowed to alter its angle by cocking or dropping its position, the transfer of the force and transmission of messages to the hand become affected.

Grip strength is one of the major weaknesses in most athletes with respect to other muscle group strengths. Pistol shooters need to spend time developing grip strength and practising grip position with respect to the pistol and elbow alignment so as to develop awareness of the best position and then transfer this through to the shooting posture.

Upper body posture and position of the spine above the hips

The most important aspect of good posture is the position of the spine with respect to the hips. If the shooter's stance allows the hips to remain stable and evenly placed, the spine should be vertically aligned above the hips, the shoulders square at the top and the head positioned vertically above.

If the spine is allowed or is caused to move to one side, as is common in the shooting posture, then the body must learn to support this by adjusting the strength and tension in those muscles that support this new position. People with scoliosis (spine leaning to one side or both at different points) have a combination of muscles that are very tight or in spasm on one side of the spine and muscles that are weak and long on the other side. The shooting posture can reinforce such spinal positions unless the shooter trains the muscles of the back to remain strong and flexible and balanced.

Shooters need to develop strength in all the muscles in the trunk and also develop flexibility in the spine to allow them to achieve a near vertical shooting posture. However, shooters must also have the strength to sustain this posture throughout a competition.

In rapid fire pistol, rotation of the body that is required to follow the targets is another important aspect of upper body posture. The normal person has the ability to rotate the trunk approximately 120 degrees. When adjusting the body into the shooting posture you must ensure that you are able to work through the middle of this range of motion. Don't start your adjustment with your body rotated or twisted outside or at the end of this normal range as this places your trunk in a stressful

position. Your muscles will be working in a more stressful way to hold this 'start' position and you won't achieve the best results.

Head position in relation to the sight and the target

Many of the shooters I have dealt with over the last few years have had problems with the neck and shoulders including tension or stiffness in the neck muscles. Tension prevents rotation through an optimal range and stiffness prevents the head from moving to the line of sight behind the pistol. As a result the shooter needs to tilt the head to the side to achieve a line of sight.

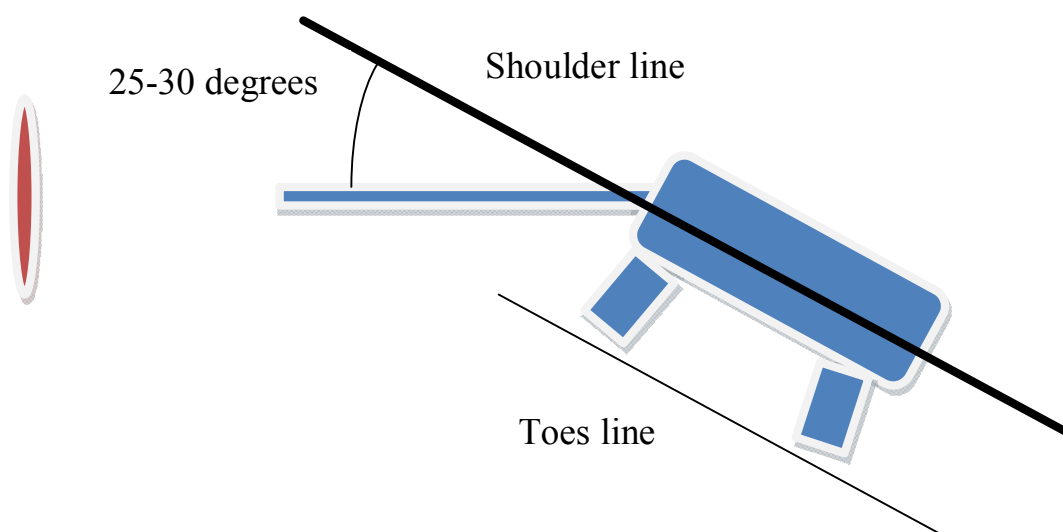
Shooters need to ensure that the neck muscles and upper shoulders are kept loose to allow a normal range of head movement. This can be achieved with exercises and stretching as well as having a good massage at least once a month or more frequently if necessary.

Without a doubt the head and its relative ability to remain loose and flexible has been the most common problem I have seen and had to deal with. The position of the neck and head is heavily reliant on the strength of the upper back and the curve of the upper spine.

If your upper back is more curved than normal then the neck is forced forwards and normal neck rotation is restricted. The Scalene muscles at the front of the neck tend to get involved and pull the neck forwards and down towards the ribs. To achieve normal forward vision the shooter will tilt the head backward to bring the eyes back up to look down the line of the sights. All this influences the degree of rotation achieved from the neck and the position of the head in the normal shooting posture.

Feet position in relation to the upper body and target

This is probably one of the most contentious issues for pistol shooters. Many coaches have offered different opinions about placement of the shooter's feet with respect to the target. From a purely ideal anatomical position, if you draw a line along the front of the toes and a line across the shoulders, the two lines should be parallel. The arm should be pointed at the target and it should be angled at 25-30 degrees from the shoulder line.



Every shooter will feel better in 'his/her' position, but the shooter needs to practice this position so as to achieve a more correct posture. Remember practice makes permanent so whatever you

practice will become permanent. Correct posture while shooting will develop a strong yet comfortable position for that activity.

If you feel that you have similar issues as mentioned here, you may be required to spend some additional time working on your physical condition. In many cases a good massage will be a great place to start and then followed by a fitness program involving the flexibility and strength exercises published in previous editions of this magazine.