

Difference in alignment in the shooting position

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In previous articles we've discussed the shooting posture largely with respect to the whole body position. The result of physical training is generally aimed at the position of the trunk, hips and legs as this tends to be the way in which most fitness programs are developed. Yet the position of the shoulder and forearm plays a major part in determining the resultant position of the pistol and alignment of the sight.



Proper supervision or coaching can determine whether the position of the firearm is incorrect due to incorrect grip or, more commonly, to poor physical or postural position of the arm.

Evident in 'young' shooters is the tendency to horizontally align the front sight with the rear sight in the aiming area such that the firearm is tilted to the right or left. In this article we discuss the physical reasons as to why this deviation to alignment may occur.

Some general indications

Apart from the obvious changes in the vertical alignment of the firearm there are a few other alignments to consider. Here are some examples.

Picture 1 (below) shows an example of the firearm tilting to the left. Notice the following conditions in the shooter's posture that produce this outcome:

- The bottom knuckle is positioned further to the right of the top knuckle,
- The shoulder appears to be lifted and closer to the chin or side of the face due to the whole shoulder rolling in as it strives to achieve the position,
- The trunk is almost side on to the shooting line and,
- As a result, the head leans to the right so as to be positioned behind the sights.



Picture 1



Picture 2

Picture 2 (above) shows the firearm tilting to the right. Again notice the following conditions in the shooter's posture that provide this outcome:

- The top knuckle is positioned further to the right than the bottom knuckle, (the reverse of picture on the left)
- The shoulder appears to be lower or away from the face, which is the result of the shoulder girdle rolling or rotating to the outside.
- The trunk is almost side on to the shooting line and appears to lean backwards.

- And as a result, the head leans to the right so that it is positioned behind the sights.

Structurally the shoulder can be held in three key shooting positions. The shoulder can rotate inwardly as in Picture 1, outwardly as in picture 2 or it can be dropped thus dragging the shoulder angle downwards. Many of these postures are the result of physical adaptations to the shooting posture where the body adjusts to cope with weakness in the relevant muscles.

Holding the firearm in these positions on an ongoing basis, not only causes degradation of one group of muscles and oversteering of opposing and/or other closely aligned groups of muscles, but often causes problems for the shooter when adjusting alignment to group shots towards to the center of the target.

Inward rotation of the shoulder



Generally, inward rotation of the shoulder results in a slightly elevated shoulder position and the follow-on change to the elbow and the wrist causes tilting of all these structures

This resultant tilt has the potential to reduce the ability of the head to be vertically aligned behind the sights and may lean to the left because of the shoulder position. The shooter may attempt to correct this by rotating the wrist, but this will create structural instability with the neutral angles of the wrist and the elbow to the shoulder altered. This alteration may give a feeling of loss of control therefore shooter's will attempts to

gain a stronger position, which results in the firearm tilting back to the left.

This posture is indicative of the front shoulder muscles being more dominant and, as the back shoulder muscles fatigue, the shoulder adjusts to a stronger position. Shooters may be susceptible to this position due to inward rotation of the shoulders i.e. slouched, curved upper back (kyphosis) and/or sway back.

Outward rotation of the shoulder



When muscle dominance allows or creates outward shoulder rotation, the shoulder will tend to drop or slouch and the firearm will tilt outward. The result is that the head will lean to the side to position eyesight in line with the pistol sights.

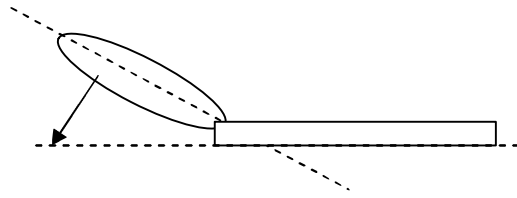
Both inward and outward shoulder rotation results in tilting of the head, but each position is differentiated by the relative position of the shoulder to the head.

This posture is indicative of stronger rear shoulder muscles than the front shoulder muscles. Shooters with sloping shoulders, forward tilting head and flat backs may be inclined to tilt the head more readily than shooters that don't display these postures.

The key to correcting both these problems of alignment, if attributed to the described physical issues, is firstly to have the shoulder and posture assessed for inconsistencies. Once identified, exercises can be prescribed to correct shoulder imbalances.

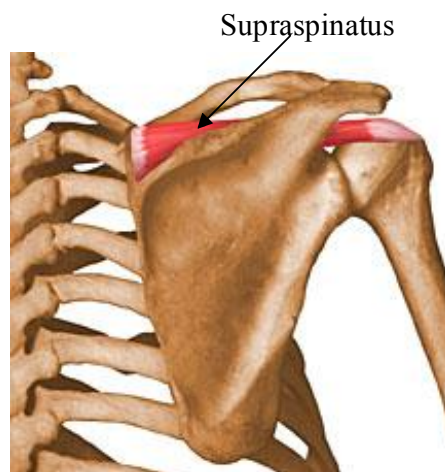
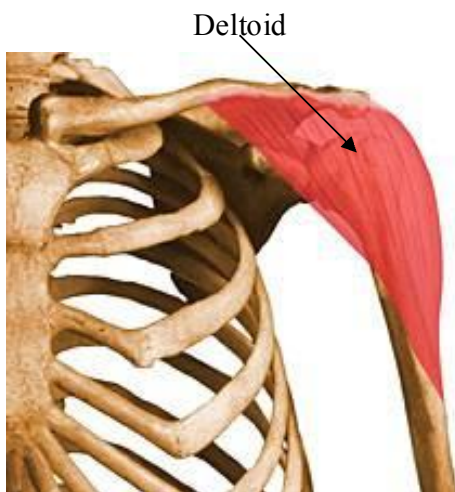
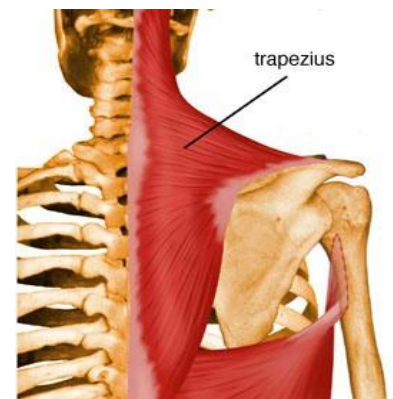
There are three key areas that must be considered during assessment regardless of the tilt angle.

1. The angle between the square of the trunk and the shooting arm must be closer to 30 degrees than to 0 degrees. The closer the square of the trunk is to the line of the shooting arm, the more likely it is that the shooter will have a destabilised and weaker shooting position.



2. The Upper trapezius is one of the main shoulder muscles and its key role is to maintain the angle of rotation of the shoulder blade (scapula) so that the angle of the shoulder joint (gleno-humeral joint) allows optimal positioning of the arm (humerus) to achieve best nerve transmission, strength and balance of the soft tissue structures

Ensure that the upper trapezius is not over stretched as overstretching of this muscle allows the shoulders to droop and create a downward angle of the shoulder joint socket. This will result in various related problems and cause pain in the shoulder.



3. The combination of the movement caused by the supraspinatus and the deltoid muscles is the chief mover in the shoulder raise as the firearm is lifted to the height of the shoulder. Shortening of these muscles requires stability of the shoulder blade so as to provide an anchor for the supraspinatus and the deltoid to activate. If the muscles that anchor the shoulder blade are weak then the movement of the supraspinatus and the deltoid will force the shoulder to drop and result in poor postures.