

FUNDAMENTALS OF RIFLE SHOOTING: AIMING & THE EYE PART II

The job of the shooter is to fire one perfectly executed shot!

There is one more peculiarity of the eyes and human vision that is important in the aiming process: binocular vision. With both eyes looking forward, our vision system developed so that both eyes normally work together as a pair, however, there is a tendency for the brain to prefer visual input from one eye over the other. This is



▶ Olympic Training Center Pistol Resident Athlete, Anthony Lutz, demonstrates the beginning position of the arms during the eye dominance test. Notice the clear result of this test.

eye dominance. It is similar to handedness, which is the preference to perform fine motor skills with one hand or side of the body over the other. The non-dominant eye provides supplementary information that the brain uses to determine distance, speed and depth perception and can take over that role if the dominant eye is ever damaged or compromised.

The general population is about 90 percent right-handed, whereas approximately two-thirds is right-eye dominant. The remainder of the populations favors the left hand and left eye, and a small fraction of people prefer neither eye. A coach is able to see that there is a small but significant portion of new shooters who will be right handed but prefer visual information from the left eye. Much less frequent would be right-eye dominant left-handers. These

shooters are termed “cross-dominant.” Unfortunately, to complicate matters for coaches, there are also degrees of eye dominance with individuals ranging from strongly to weakly dominant and the fact that dominance can change due to fatigue.

To conduct an eye dominance test, have the shooters stand and with their arms fully extended in front of their body, crossing their hands to form a small opening with their thumbs. Next, with both eyes remaining open, have them look through the opening at a distant object (your nose is a good focal point). At this point, you can easily identify the dominant eye, which you can now see through the opening in the shooters hands. Have the shooters bring their hands slowly toward their face, keeping the selected object in view at all times. When their hands touch their face, the opening in the hands will be over the dominant eye. Repeat the exercise if necessary to clarify ambiguous results.

Shooters who have strong eye dominance on the same side as their preferred hand are a simple case. They shoot from the preferred shoulder. The next segment comprises those who are weakly dominant on the same side as their preferred hand. These shooters may be confused by a double vision of the front sight and need to block the extraneous information coming into that eye. The third group includes new shooters who are weakly cross-dominant and may be able to shoot from their preferred hand side but will definitely need to block the confusing visual image. You should also try shooting from the opposite shoulder to see if these shooters can perform better. If they are strongly cross-dominant it is probably best to shoot from the shoulder of the preferred eye. These cases are easy to spot because shooters will try to see through the sights with the opposite eye and forcing their head into an unnatural position.



▶ The picture illustrates the final phase of the eye-dominance test. Please pay attention to how close his hands are to his eye. Throughout the entire test, the coach/tester should have a clear view of the shooter's dominant eye. As anticipated from the primary phase of the test, Lutz is a left-handed pistol shooter who is clearly left-eye dominant.

OCCLUDERS, BLINDERS, HATS AND VISORS

Squinting or closing of the non-aiming eye to eliminate the double image of the front sight can cause eye fatigue and muscle strain. Additionally, by closing the non-aiming eye, that pupil will dilate because it is not receiving the amount of light it normally would, and because of a sympathetic response, the aiming eye's pupil will open more than normal. This can cause a loss of focusing ability and increase eye fatigue. As coaches, we should strive to have our athletes utilize the body's natural tools in the performance of a task; therefore, both eyes should remain open. The solution for the double image is to use an occluder.

Often made of an opaque material like target paper or a translucent material like plastic milk carton, an occluder is an object that blocks some of the field of view reaching the non-shooting eye. Translucent material allows some diffused light to enter the non-shooting eye, allowing both eyes to receive similar amounts of light. Occluders are attached to the either the rear sight or the shooter's glasses. Avoid black color or covering the eye completely with an eye patch, as this will trigger the sympathetic pupil response.

Blinders, like horse blinkers, are made of paper or other material and serve to stop light and distracting movements from entering the eyes from the left and right sides of the head. Check the competition rules for restrictions on the size and placement of blinders and occluders.

Hats or visors prevent overhead light or glare from interfering with obtaining a clear sight picture. Again, there may be limitations on hats and visors. The brim of the hat or visor should not touch the rear sight as this may be against the rules, but more importantly it may cause flinching or blinking of the eyes as a conditioned response in anticipation of the shot.

PRACTICAL USE OF THE EYES FOR SHOOTING

No two sets of eyes are identical. Even between a shooter's set of eyes there are differences in acuity and light sensitivity. It is impossible, therefore, to formulate an exact missive concerning the aiming process and system that applies to all people; but some generalities

apply to most, but not all, people. We will assume the shooter's eyes are in good health (or aided by corrective lenses), and that the sights and accessories are in good condition and the shooter knows how to use them. So with all of this knowledge, how do we use the visual faculty to the best advantage?

If the eye focuses intently on an object longer than eight to ten seconds the photochemical reaction associated with the rods and cones becomes overloaded and the regeneration that normally takes place slows down. The shooter can then experience a false or "burned image" on the eye's retina. This false image continues transmitting to the brain, which perceives a "correct" sight picture, when in reality the sight has drifted away from the center. The shooter swears the shot was good but it often lands in a very different place. You can try it yourself. Look intently at the sight picture (Figure 1) here for ten to twelve seconds then look at a blank wall. You will see a ghost image of the sight picture even though you are no longer looking at it.

Encourage shooters to look away from the sight picture between shots with an unfocused gaze into

the distance at a neutral colored background, to allow the eyes to rest and recover between shots.

A common error in aiming, especially for beginners, is aiming too long as they try to hold the gun on the target. It should be fairly evident how important it is to not abuse the eye focusing muscle by shifting focus too frequently from one point to another, for example from the sights to the target and back to the sights. The shooter must also not aim for extended periods without resting the eye. Thus, eight to ten seconds of intense aiming is the limiting time for the entire shot process, as we shall see later. Over-aiming beyond 10 seconds causes premature eye fatigue and even one occurrence can compromise vision for subsequent shots unless time is given for the eyes to rest and recover.

Another common aiming error occurs when shooters pick up the rifle and immediately begin intense aiming. They are trying to obtain a good sight picture before they are really ready, which leads to over-aiming. Only allow aiming when every other aspect of preparing for the shot is complete.

▪ *Marcus Raab*



Figure 1