Dear Colleagues

**Control of shots outside the V-bull or 6-ring, with many at 9 and 3 o'clock**

**The Problem:**  a member of a club team let his coach know before a teams’ match, that he had worked upon the techniques which had most widened his 1 MOA group:

* support of the weight of the arm and rifle by arm muscle tissue under tension (TR)
* shot-release during the imagined second stage of the trigger, controlled through a hopefully still image of the aiming mark in the centre of the foresight ring or scope element (TR, F Class)
* the mind being occupied for the entire period of the imagined second stage, estimating progress toward final release (TR, F Class).

However, the shooter found that the group actually consisted of a small group of close shots within the 1 MOA V-bull or 6-ring, with about 50 percent of shots across the 2 MOA bullseye ring. That is, the group now resembled a tremor shoot, containing a small close pattern in the middle surrounded by loose shots. Another shooter in the club experienced the same tight pattern in the centre, but accompanied by a further 1 MOA group centred upon the edge of the bullseye at 4 o’clock. The club coach advised that the wider shots in both patterns, were typical of tremor shots, resulting from the shooter’s hold at the pistol grip.

During the next inter-club teams’ match, the coach advised the first of these TR shooters, slow down your imagined second stage and you will shoot more V-bulls. The shooter was amazed and simply did what he was told. At the end of the shoot both were happy because the score was 50.9. The other shooter expecting a small central group accompanied by a wider group at 4 o’clock, was likewise very happy when told to slow down, because this brought both of his groups into the centre, also scoring 50.9. Among the F Class shooters, a lady shooter with small and sensitive hands, had no difficulty releasing shots slowly and carefully into the 6-ring and the 0.5 MOA X-ring, to score 90.12. However, each of the three shooters usually experienced odd shots on the edge of the bullseye or within the inner ring, usually at 8 to 10 o’clock and 2 to 4 o’clock. The flags confirmed that these shots occurred regardless of changes in wind velocity.

At the post-mortem following the team’s match, the coach was happy to discuss having to ask the shooters to slow down. From the start of a shoot, the coach could see where each shot went when the shooter released in less than 3 seconds from the word Go. Upon asking each shooter to not release quite as fast, in say 5 or 6 seconds, the shots then went into the V-bull. In the F Class team, the lady already knew this technique well, having practised it. Her small and sensitive hands appeared to enable her to release better shots, a result of innate care and timing.

This article describes the occurrence of shots beyond the 1.0 MOA group, which can be brought back into the V-bull or 6-ring upon marginally slowing the rate of release during the imagined second stage of trigger release. It also describes the experience of most shooters, who find they are able to eradicate 1 MOA groups of shots on each side of the bullseye.

**Discussion:**  shooting a 1 MOA group (TR) or 0.5 MOA (F Class), requires considerable control of:

* the very small movements of muscle tissues of the supporting arm and the trigger finger
* awareness and control of effects of the adrenaline response
* uniformity of tension of the reloading hand returned to the pistol grip after each shot.

The adrenaline response is complex and commonly experienced as a small muscular spasm or tremor. It can be controlled to some extent, if the person is able to minimise nervous excitement and bodily movements. Mature women with small hands and very gentle control of trigger release, appear able to more easily minimise excitement and muscular movement, then release a shot using this control. On the other hand, a mature man who experiences the release of adrenaline in larger quantities around the body, can be observed experiencing a small shake or tremor of the head, face, shoulder and hand that controls the trigger. This person, with a longer measurable appearance of tremors in the body, experiences greater difficulty increasing the level of muscular control. The end result of this comparison is that a woman with a smaller stature and considerable control of her nervous reactions, appears able to release a shot with far better control than a large man. Adolescents are different again, tending to experience the adrenaline response more intensely and over a longer time period.

**Practical:** from the above, every person has a need to control the effects of adrenaline flow. This is because it affects control of movements of the rifle during the imagined second stage of trigger release. The difference between these shooters is the time of shot release measured from the start of the second stage. That is, if a shooter has taken the trigger to the end of the first stage, to the point where it can be felt to bite and waits until the coach quietly says Go, the imagined second stage can occur in the complete absence of an adrenaline tremor:

* if the shot is released after 3 seconds, by a shooter who has the adrenaline response under close control
* after 5 or 6 seconds, by a shooter who has less control of the adrenaline response. If the shot is released within this longer time period, then there will be a clash with a bodily tremor.

When the clash occurs, the muzzle of the rifle can be recorded moving before the projectile has left the barrel. Such a shot will be found to go anywhere within the bullseye or even further out. If there is no muzzle movement, then this shot can be recorded grouping within the 1 MOA V-bull or 6-ring. There are now many F Class shooters and even TR shooters who, through awareness of this mechanism, are able to group within the 0.5 MOA X-ring.

If a team coach is able to record the wide shots when release is faster, then there is a need for advice to be given to the shooter to select a slightly longer time interval, where no clash occurs with a bodily tremor.

Many shooters routinely measure this time during dry practice, when the scope element or foresight is not seen to move at the moment of release of a dry shot. Otherwise he/she needs a coach to plot where live shots group as a result of being released within 3 or say 6 seconds.

Shooters should otherwise ensure uniformity of hand tension on the pistol grip, which overcomes shots at 9 and 3 o’clock.

**Conclusion:**it can be experimentally shown that by controlling when a shot should be released, so as not to clash with a bodily tremor due to adrenaline, then a means exists tor this shooter to group entirely within the V-bull (TR) or X-ring (F Class). Conversely, if a shooter takes no care to avoid clashing with a bodily tremor due to adrenaline, then a 2 MOA group will occur and render it impossible to score a 50.10.

Best regards

Geoff