

## Factors That Contribute to Hold

The most critical component of holding ability is a biomechanically sound position. Movement will vary in size and predominant movement pattern with each position, with supported or sling positions being relatively stable and durable, while standing is less stable. Each position presents its own challenges. Nevertheless, there are some principles that apply to all positions. It is how well these principles are applied that determines success in each position. The elements of a sound position and its development are:

- Bone Support
- Balance
- Natural Point of Aim & Alignment
- Comfort
- Consistency
- Legality

## Skeletal Structure and Bone Support

The human skeleton consists of both fused and individual bones connected, supported and supplemented by ligaments, tendons, muscles and cartilage. It serves as the framework that supports organs, anchors muscles and protects critical organs such as the brain, lungs and heart.

Muscles, even strong muscles, will fatigue and not respond in the predictable way needed for the ultra-fine motor control necessary to execute a precise shot. The bones of the skeleton do not suffer the same problem of fatigue and may be used almost indefinitely as the structural elements of the shooting position. In rifle shooting, with heavy guns and long courses of fire, maximizing bone support is an important aspect of developing a good position and hold. Of course some minimal amount of muscle tension is required to maintain the skeleton in the same orientation.

For the body to remain stable in any shooting position, the legs and arms that support the rifle must form vertical planes. This transmits the weight of both the rifle and body directly into the ground without the need to use muscle. While the sling plays a major structural role in helping support the prone and kneeling positions, shooters still need the bones in the proper orientation to maximize support.

## Balance

The act of balancing requires simultaneous processing of inputs from multiple senses. This includes equilibrioception (from the vestibular system located in the inner ear), vision and proprioception (the body's sense of where it is in space). The senses detect changes of body position with respect to the base while the motor system controls muscle actions to maintain balance.

Proprioception is the sensory mode that provides feedback and indicates whether the body is moving with the required effort. Additionally, proprioception detects where the various parts of the body are located in relation to each other. Proprioceptors on the bottom of the feet, for example, sense the pressure as it changes from the shift in the center of gravity.

Both kneeling and prone require balancing as well. Kneeling has a larger base of support than standing but less than prone. Even then, the kneeling position is balanced between the right foot, the kneeling roll and left foot. In prone the rifle is balanced on the left arm.

An erect head position is the key to maintaining balance. Not just for the balance apparatus in the inner ear, but also for the eyes and vision. The importance of visual input for balance is illustrated by the fact that it is harder to stand on one foot with your eyes closed.



## Natural Point of Aim and Alignment

The Natural Point of Aim (NPA) has nothing to do with the target rather it is where the rifle naturally points when the body is relaxed. The objective is to adjust the athlete's position so that the rifle points naturally at the target center when the body is relaxed. Alignment to the target is correct when the body is in a relaxed position supported by bone structure (with minimal muscle tension) and the rifle naturally points exactly at the center of the specific target.

Alignment is not just left and right, but up and down as well. There are several methods to check NPA but one method is suggested below:

- Relax with head on the stock
- Close the eyes or glance away
- Check balance & muscle tension
- Open eyes & see where rifle is pointing
- Make needed adjustments & test again Check-adjust, Check-adjust, Check until it is perfect.

Adjustment mechanics are different for each position but the goal is the same. NPA should be checked every shot as an integral part of the whole shot process. If the NPA is aligned correctly, the athlete will see the rifle sights approach the target from exactly the same direction, and then slow and stop exactly on the center of the target. The shot can then be fired with confidence. When alignment is not correct, the temptation is to engage the muscles to push the sights to the center. This results in poor shots as the rifle will move away from the center as the shot is fired. If the NPA is exactly centered and the shot is released on the outside of the hold area, the rifle will tend to move toward the center. A better shot is the result. This is the reason for checking alignment until it is perfect.

## Comfort

All shooting positions should be reasonably comfortable. Some discomfort is inevitable, especially during beginner training or after a long layoff from shooting, but within a few minutes of getting out of position the discomfort should disappear. Early training sessions should be intentionally short so that the athlete can build up a tolerance to the pressures of the sling and kneeling roll.

Pain, however, is never a good sign and may indicate an injury or other problem. If the athlete is in pain, stop immediately and apply appropriate first-aid. Before allowing the training to continue, make certain that any issue has been resolved.

A good position allows normal flow of blood between the heart, head, arms and legs while shooting. Some restriction of blood flow and impinging on the nerves of the arm may occur when using a sling, but that can be somewhat alleviated by wearing thick sweatshirts or undergarments and a shooting jacket with a properly adjusted sling. The kneeling position can also restrict blood flow to the leg and also impinge on the nerves that pass behind the knee. Comfort can be improved in the kneeling position by spending time in position on the kneeling roll while engaged in some other activity like reading or watching television. Building up the time that the athlete can comfortably stay in position will make it easier to stay focused on shooting instead of thinking how bad their foot and ankle feels. Stretching and flexibility exercises can also help improve overall comfort.

## Consistency

In rifle shooting, we are trying to place one shot on top of the other in the center of the target. The only way to accomplish that task is by having a solid position that allows the athlete to continually reproduce the same shot process. Without being consistent, the chances of performing successfully are low. Consistency is not just shot-to-shot, or even series-to-series, but also day-to-day. After the basics are learned, next to come is the introduction and development of the shot process or routine. As the athlete enters competitions, a setup routine is also needed. It all boils down to repetition in thought and action as trained.



## Psychological Interconnectedness

Holding still or hold control is as much about the mental efforts used to reduce or control body movement as it is the physical positioning. Conscious thought about correcting the aim almost always results in over-correction of the error and a jerky response. Movement of the rifle can be somewhat controlled by turning one's attention inside the body through the inner position.

Ask yourself questions such as: "Muscle tension, is it correct? Where is it too much?" Breathing, elps control emotions, relaxing both the body and mind and reduces unneeded muscle tension. A small change will stand out if the background tension is low. The mental control of the hold, however, is more about the focused thought or intention of "smaller," "slower" or "center" and will likely be more productive than consciously trying to correct or adjust the hold while aiming.

Top-level shooters from around the world describe this mental control of their position, and thus their hold, in a wide variety of ways. From that of being a granite statue or leaning up against an imaginary wall to resting their elbows on imaginary tables at just the perfect height or holding themselves in the perfect position with an imaginary corset; whatever the mental key, these shooters exert their will to hold still. Essentially it is mind over matter. All of these images, and more, have been used successfully. It is, of course, a very personal choice and no one should be forced into any specific trick described here, but rather given the idea and the freedom to test and develop their own best solution to holding still. Of all the fundamentals, holding the rifle confidently on the center of the target is the most critical for shooting success. Everything else follows from that. But without being able to execute the shot, the best hold in the world is useless.



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