



Always refer your shooter to an experienced exercise physiologist or physiotherapist for a more detailed assessment of posture and exercise prescription.

# Coaching Column exercise for specific postural variations in pistol shooting

By Mark McKean

I recently discussed the qualities and loads of training that pistol shooters of all levels should be working towards as well as the stance of shooting as a combination of the total person's posture. In this issue, which is part one of a three part series of articles on postural positions, I would like to explain in more detail the types of postures that are commonly found in the back and spine and what needs to be done with these postures to strengthen them and allow the person to function well as a shooter.

The next two articles will deal with shoulder and then hip positions and what we as coaches need to know to assist these positions. Typically there are three common positions for the back and spine including the Chest Forward Posture, the Kyphotic-lordotic Posture, and the Flat Back Posture.

## **Chest Forward (Military Back) Posture**

This posture is typified by having the head in a neutral position, the neck or cervical spine with a normal curve but with a slight forward lean. The upper back or thoracic spine would look normal

but with a slight posterior (backward) lean. The lumbar spine or lower back would look hyper-extended or more curved than normal and the pelvis would have an anterior tilt (bottom stuck out). This person may also commonly hold the knee joints in a slightly hyper-extended or locked back position.

A shooter who exhibits this type of posture will tend to lean their upper body further backward and stick their bottom further out causing a shift in the balance and place more stress on the shoulder to maintain a steady arm position. There may be a loss of the 'feel of balance' and this will cause the shoulder to try and track more allowing less control to set into the shoulder stabilisers. Over long periods of time the shooter may experience cramps or spasms in the lower and middle upper back and feel tension through the hips and legs with a feeling of stiffness instead of balance.

In the Chest forward posture the abdominals, hamstrings and occasionally the gluteus muscles (bottom) behave as if they are longer than they should be. These muscles need to be strengthened and shortened by specific exercises that will teach the muscles to behave shorter.



Here are some examples of strengthening exercises:



### Abdominal Crunch

Suck your tummy in and crunch shoulders and back off the floor. Hold for 4–6 seconds and repeat 6–8 times

### Hamstring Curls

Lie over swiss ball and slowly bring the leg up to the bottom. Stop half way for 6–8 seconds. Return to the bottom and start again. Repeat with each leg, 4–5 times



### Hip Lifts

Place feet on the ball and try to lift your bottom off the floor. Hold for 6–8 seconds and repeat 4–8 times



Similarly the lumbar extensors, hip flexors, mid thoracic extensors and quadriceps behave in a shortened manner and they need to be stretched to make them behave longer again. Here are some sample stretches:

Other exercises that can be included are leg curls, prone leg curls, gluteus extensors, bridge holds, and squats. Unless you have a trainer to show you how to hold your posture correctly, try to avoid back extensions, seated rows, lateral pull downs, leg extensions and unsupported abdominal crunch variations as they have a tendency to increase the military back position.



### Lower Back

Tuck one leg in and lean forwards to the long leg and place your elbow on the floor inside your knee. Hold 30 sec. Repeat each side.



### Hip Flexors

Lie over a bench or chair and lift one leg into the chest. Hold for 1–2 minutes each side letting the other leg just hang down. Repeat on each side.



### Upper Back

Sit on the floor and lean chin towards chest rounding the upper back. You may also use your hands behind your neck to help pull your back into a rounded position. Hold 30 sec

### Quadriceps

Kneel on one knee, suck your tummy in and squeeze your bottom tight. Hold for 30 sec and repeat on the other leg.

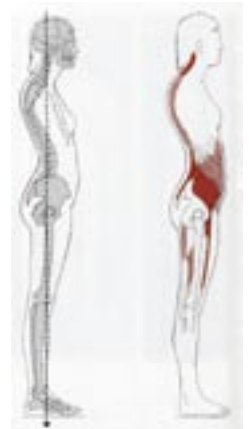


### Kyphotic-Lordotic Posture

This posture is typified by having the head too far forward, the cervical spine or neck hyper-extended or too curved, the scapula (shoulder blades) spread too far apart across the back, the thoracic spine too rounded (increased kyphosis), the lumbar spine curved too deeply (increased lordosis) and the pelvis has an anterior tilt (sticks out).

Shooters with this type of posture will crumple much like a concertina door as they fatigue.

More likely to occur in men than women, they will become more hunched, their hips stick out more behind them and their tummy protrude more in front. This change in upper body posture will cause more stress on the shoulder joints as it restricts the range of lift that is free and easy and the shoulder muscles have to work extra hard to get the arm up and hold it steady. As this is closer to the



extreme range of the joint, the nerves feeding all the arm muscles will be under stress and may cause a less than steady normal hold position. Lower back pain is common after standing or competing for even short periods and neck tension will also increase.

In the Kyphotic-lordotic posture the neck flexors, upper back extensors, external abdominal obliques, and hamstrings behave as if they are too long. These muscles need to be strengthened and shortened by specific exercises that will teach the muscles to behave shorter. Here are some examples:

### Neck Flexors

Start with your head on the floor and slowly draw your neck in down to the floor. Lift your head off the floor if you are still able to keep the muscles in the front of the neck switched on.



### Bent Over Raises

Stand with your knees bent and your back bent forward at 90 degrees. Slowly raise the arms out to the side keeping your back flat and lower them back to the floor. Complete 2sets x 10–15 repetitions.



### Oblique Crunch

With one elbow on the floor and both hands on the temple raise your body and twist over to touch the opposite knee with the elbow. Hold for 3–4 sec and return to the floor. Repeat 5–8 times on each side.

In opposition to these weak long muscles the neck extensions, hip flexors, quadriceps and chest behave in a shortened manner and they need to be stretched to make them behave longer again. Here are some sample stretches:

### Neck Stretch

Keeping your back straight, pull your head gently forward and hold 5–10 sec. Repeat 2–3 times



### Chest Stretch

Lean against the wall with your arm outstretched. Turn your upper body away from the wall to stretch the front of the shoulder and chest on the side of the arm. Hold 30 sec each side.

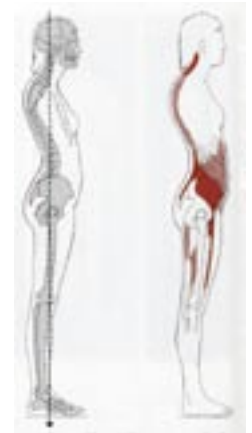


Other Exercises that can be included are leg curls and upper back extensions. Exercises that should be avoided unless you have a trainer to show you how to hold your posture correctly whilst doing them include overuse of neck in back extension type movements, leg extension, hip flexion, unsupported abdominal crunches and overuse of chest extensions overhead actions e.g. shoulder press, abdominal pullover, lateral pull downs.

### Flat Back Posture

This posture is typified by the head being too far forward, cervical spine slightly extended and straight, increased curve in the upper half of the thoracic spine, a decreased curve in the middle back and the lumbar spine is flattened or straighter than normal.

Shooters who look like this are more likely to be male than female. Weak gluteus muscles and flat back tend to create unstable standing positions and tight hamstrings. These conditions will lead to fatigue of the trunk when standing and shooting. This may appear as a slumped posture where the hips drop forward and the back sags forward.



In the Flat Back posture the hamstrings tend to behave shorter and tight and the one joint hip flexors and occasionally back muscles tend to become long and weak. Hamstrings need to be lengthened and hip flexors and back muscles need to be strengthened.

Here are some examples:



### Hip Flexion

Straight leg raise. Sit with your back against the wall and slowly try and lift the straight leg. Hold for 2–3 sec and repeat 4–6 times. Pad your lower back to keep the arch in your back.

### Upper Back Extension

Lie face down and lift the upper half of the trunk and head. Hold for 6–8 sec and repeat 4–6 times.



Other exercises to include can be back extensions and supported abdominal crunch exercise. Exercises to avoid would include deep leg press, deep squats & lunges, unsupported abdominal crunches, high step ups, and leg curls.

If we, as coaches, can see what type of posture our shooters appear to have we will be able to identify how they fatigue and change their shooting position as well as identify the things we can do that will assist them to develop better shooting postures. Always refer your shooter to an experienced exercise physiologist or physiotherapist for a more detailed assessment of posture and exercise prescription. 🌟