

## Strengthening the muscles in the forearm

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Previous articles in this magazine dealt with strengthening posture and muscles of the shoulder, pelvis and trunk. To complete this series, this article aims to discuss techniques for strengthening the muscles in the forearm and hands. Grip strength of the hands is often not included in training as it is frequently not recognised as an important factor. Yet, to the contrary, research has shown this to be extremely important in many sports including pistol shooting. Training to improve grip strength is often a limiting factor to achieving general strength. For example, an inability to hold a bar in weight lifting results in an inability to lift heavier weights when bench pressing or doing seated row exercises. A strong grip is required to perform many tasks and good grip strength is critical in pistol shooting.

Grip strength compares directly to feelings of well being in the elderly. Studies have shown that as grip strength declines so does our capability to perform normal daily activities (Gale, *et al.* 2007). Typically, grip strength improves quickly up to the age of 20 and then more slowly until the age of about 30 when grip strength peaks and then gradually declines. Grip strength is of particular importance in pistol shooting as it is directly related to and influences accuracy. Shooting accuracy tests



have shown that people who have higher grip strength and those who have improved their grip strength, achieve higher scores (Copay, *et al.* 2001). Imagine improving your shooting performance just by improving your grip strength.

Further studies conducted have examined the relationship between marksmanship and variables in both strength and muscular endurance. These studies assessed strength in the upper body, grip and trigger finger, endurance and technique of the trigger finger and hand length. Results were related to shooting performance and showed that the trigger finger endurance test can be used to predict

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accuracy. (Copay, *et al.* 2001). Put simply, the better the endurance of the trigger finger the better the performance.

In addition, research also has shown that there is a strong relationship between grip strength and performance in precision shooting, between the strength of the deltoid (muscle covering the shoulder joint) and performance in timed shooting and between the strength of the deltoid and performance in rapid fire shooting (Vercruyssen, *et al.* 1988). Thus more evidence to support the fact that pistol shooters should be doing additional grip strength training as an effective and simple way to improve performance. Additionally, individual subject analysis revealed that those who achieved improved strength also improved in general shooting skill. So not only does grip strength relate directly to well being and physical ability as we age, it also directly influences accuracy when shooting. Therefore I hope you are now considering ways to incorporate additional grip training into your program.

The next step is to determine how to train these muscles and then how to include this type of training into your pistol shooting program. Let's look firstly at which muscles are involved and how they are used in various activities.

There are many muscles in the forearm that control the use of the hand, which are generally grouped at the front or back of the forearm. The "flexors" are the muscles at the front of the forearm that wrap the fingers around the grip while "extensors" are the muscles at the back of the forearm that release the fingers or cock the wrist. As for all muscles, these muscles must be continually used or they will become weaker. As previously mentioned studies have shown that if you don't exercise your flexors, your grip strength will decrease as you age and this has many implications for the shooters in their late 30's. Training the flexors to increase grip strength must extend beyond simply dry firing and normal practice at the range. You need to be proactive in developing and training these muscles to do the task that you want to improve.

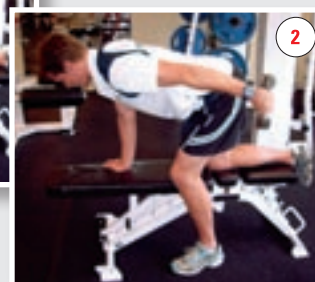
Essentially there are four key exercises that you can do at home or as part of your firing practice starting with general strength training in exercises demonstrated in Figure 1 & 2. After 6-10 weeks add into your routine more specific training as illustrated in Figure 3 & 4.

Essentially, there are four groups of exercises that you can do at home or as part of your dry firing practice. These strength training exercises include wrist and elbow extensions, wrist and elbow flexions, wrist rotations and grip strengthening exercises.



1

LEFT: Tricep kickbacks in the starting position



2

RIGHT: Tricep kickbacks in the end position

**Wrist and Elbow extensions** can include Tricep kickbacks demonstrated in Pictures 1 & 2. After 6-10 weeks include more specific training exercises such as lying Tricep extensions (Picture 3) and wrist extensions (Pictures 4 & 5). Perform each exercise 2 x 8-12 times.



3

Lying tricep extensions



4



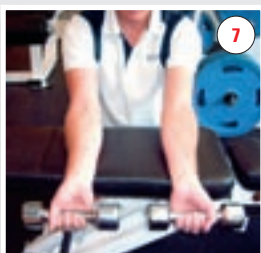
5

Wrist extensions start position (left), and end position (right)

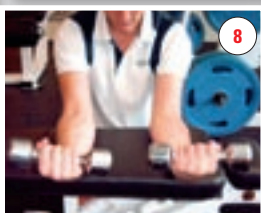
**Wrist and elbow flexion** activities can include dumbbell curls (Picture 6) and wrist flexions (Pictures 7 & 8). Perform each exercise 2 x 8-12 times.



Dumbbell curls



Wrist flexions



**Wrist rotation** activities include dumbbell flicks with wrist parallel to the floor as in Picture 9 and with wrist at right angles to the floor as in Picture 10. This exercise is performed by resting the forearm on a secure surface with the wrist parallel to / at right angles to the floor, gripping the centre of a dumbbell across the palm and rotating the wrist up and down / from side to side. Perform each exercise 2 x 8-12 times.



Wrist rotation in the start position    Wrist rotation in the end position



**Grip strengthening** exercises such as grip holds (Picture 11) are performed by stretching the palm over the top of a relatively heavy object, gripping it between the thumb and fingers and holding the object for 6-10 seconds. The exercise should be repeated at least 6 times in one training session.

You must also decide when it is best to incorporate this additional training into your routine, which could be before or after dry firing or before or after range practice bearing in mind that both options come with good and bad points. Firstly, if done before firing practice your goal should be to only warm up these muscles and “switch” them on. A few exercises will have a positive effect, but if you do too much, and that is relative to the individual, you risk causing fatigue, which will result in a poor training session. Ideally, it is best simply to supplement your training session by incorporating these exercises at the end. Alternatively you can do them some time later on the same day as your firing practice training session or even on another day.

If you are time poor and you can only do very small amounts of additional training, simply go to the last grip strength exercise and try to do it at home or at work. Start with small loads such as a small weight or heavy book or even your pistol and grip it between your fingers for up to 10 seconds and repeat for up to 10 times. Try not to use something that is too easy to grip, instead find something that is smooth and requires you to grip firmly and strongly so to prevent it from slipping. Don't use anything heavier than 5kg for women and 10kg for men unless you do regular strength training.

If you are able to invest more time in developing strength in your forearm, you should complete three sessions of additional strength activities as per the exercises discussed above. This will take about 20-30 minutes and should be done on alternate days to firing practice and it will take 4-6 weeks to see improvements, but it will be well worth your time and effort. For more ideas on how to improve your grip strength speak to your coach and try to come up with other variations to the ones that I have discussed here. 🌟

### REFERENCES

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