

Improve start time and sprint speed by squatting before the race

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Introduction

More and more research is showing us that warm-up effects sports performance. However, few studies have examine the effects of different types of warm-up on sprint performance in swimming. Here is a recent study that has suggested (nothing is definite in science!), using moderate-heavy squats before sprint races reduces the time spent on the block after the gun as well as increases speed to 5m and 15m in the pool. At least in younger swimmers!

The Research

This Spanish study compared the effects of 2 methods of post-activation potentiation (stimulating muscles before performance by heavy weights to improve subsequent performance) of the leg muscles on swimming start times and sprint speed. 4 female and 10 male well-trained swimmers performed sprint starts and short all-out swims **8 minutes after three different types of warm-up:**

1. **Standard** swimming warm-up with no heavy stimulus of the leg muscles before a sprint start and the short all-out swim.
2. **After the standard swim warm-up do 3 lunges at 85% of the maximum lunge weight** 8 minutes before a sprint start and the short all-out swim.
3. **After the standard swim warm-up do 4 squats on a flywheel device called the [YoYo squat](#)** 8 minutes before a sprint start and the short all-out swim.

High speed cameras recoded velocities off the block and time to 5m and 15m in the all-out short sprint.

The Results

The speed of the swimmer's flight improved after both the warm-ups using the weights 8 minutes before sprints, with the greatest improvement after YoYo squat warm-up (See Table 1 below). **Table**

1: Velocity off the blocks after three different warm-up procedures

Warm-Up	Velocity off the blocks (m/sec)
Standard Swim Warm-Up (SWU)	3.63±0.11
SWU then Lunges	4.15±0.12
SWU then Squats	4.89±0.12

After the YoYo squat warm-up, it took the subjects less time to cover a distance of 5 m and 15m compared to the other warm-ups. Subjects also achieved a higher speed of the knee straightening and a reduction of the time on the block using the squat-type of weights in the warm-up.

So What?

While this research was done on younger swimmers, the results demonstrate that muscle performance when doing a swim start can be improved when a warm-up with specific-action weights (squats for swim starts) are used 8 minutes or so before a sprint swim such as a 25m or 50m swim. While I know it may not be realistic at most swim meets to do gym work like this, simply doing squats in place or against a wall might help. As previous research has also shown, swimmers can benefit from a plyometric warm-up in order to improve overall sprint swim performance, especially when considering that a few hundredths of a second would make a difference in the results of a sprint. So when doing the squats, make them plyometric jumps into the air to really stimulate the muscles in the same action you are going to use in the start. Not so many that you fatigue yourself, but 4 or so to really stimulate the nervous system that activate the muscles used in the start.

Source: Cuenca-Fernandez, F. and others (2015). Effect on swimming start performance of two types of activation protocols: Lunge and YoYo squat. Journal of Strength and Conditioning Research, 29(3): 647-655.

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