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## How to Perfect Your Swim Tempo

Fast and efficient swimming is determined by two interrelated aspects of the swim stroke: stroke rate (tempo) and stroke length (distance per stroke). Many new swimmers tend to overemphasize tempo over distance per stroke, and fail to recognize how connected both of these concepts are when looking to perfect the swim stroke.



Effective and efficient swimming is the ability to hold or catch the most amount of water at a given stroke rate while minimizing the amount of drag on the body for each stroke. If a swimmer focuses on stroke rate at the expense of developing stroke length, speeding up the stroke will result in a decrease in efficiency. In other words, you'll be slipping more water faster. If you overemphasize distance per stroke over tempo, you won't be very efficient, either. The best stroke is the one that finds a balance between tempo and distance per stroke for the individual swimmer.

Stroke tempo is the equivalent to cadence in running and cycling. The easiest way to measure stroke tempo or one complete cycle of the swim stroke is to start a stopwatch when the right hand enters the water and stop it when the right hand enters the water again. The number you get will be seconds and tenths-of-seconds. For fast distance swimmers, it will be somewhere between 1.2 and 1.8 seconds (100 to 68 strokes per minute) for men and 1.2 and 1.4 seconds (100 to 88 strokes per minute) for women.

Tempo can impact body position, overall speed, and—if it is inconsistent during a race—can decrease overall efficiency of the stroke. Similar to running, where the arms drive the cadence of the legs, in swimming, the legs can drive the tempo of the arms. A casual review of the 2016 IRONMAN World Championship in Kona shows that men in the front pack have a stroke tempo between 1.3 and 1.6, and the front pack of women were roughly the same. The second and third packs of men and women tend to have tempos outside the range of the front pack, typically faster and slower.

The second half of the equation that determines speed and efficiency in swimming is stroke length, or distance per stroke. You can determine your DPS by counting the number of strokes it takes to get to the other side of the pool at your "cruise pace." For faster distance swimmers, a count in the mid-30s in a 50m pool for men is the norm and for women it tends to be in the upper-30s to low-40s. Stroke length or distance per stroke is impacted by overall hydrodynamics, which includes body position in the water and body type. Strength is also a component, as is "feel for the water," or the catch, and how much water a swimmer can hold during the pull phase of the stroke.

How does stroke rate and stroke length impact training? As a swimmer trying to develop a faster and more efficient stroke, design your training around improving both tempo and DPS efficiently while finding the right balance between the two. Long, slow, continuous distance along the lines of the popular 10x400-meter freestyle tends to train the body to have a slower tempo. If those sets are swum without a high level of focus on tempo and DPS, they tend to impact stroke mechanics, which leads to a shorter stroke length. In other words, those sets train inefficiency into the stroke.

Shorter, higher intensity repeats drive speed and efficiency into the stroke at a much lower cost. If you use paddles a lot, you will train your body to swim at a slower tempo and diminish your feel for the water—again, impacting negatively your distance per stroke.

This combination of drills and workout will help develop the right balance between tempo and distance per stroke (all distances are in meters):

#### Warm Up

400 swim w/fins

300 kick w/fins

300 pull no paddles

8 x 50 descend 1-4; 5-8 @ (an interval that gives about 10-15 seconds rest at the start)

1400

#### Lead Up

4 x 75 kick/swim (25 kick / 50 swim) @ (an interval that gives about 15-20 seconds rest)

1700

#### Main Set

Set a "hold pace" before the start of the set—the fastest pace for 40 seconds that you can hold, plus 20 seconds of rest. If you miss a hold pace during the set, sit out the next two 25s to rest, then jump back in. If you miss the hold pace again, do the remainder easy. This is an indication that your body cannot make an adaptation to the training any longer and you do not want to continue to try to make an adaptation to a slower and less efficient swim.

40 x 25 swim @ (interval is determined by fastest time you can hold the 25s plus 20 seconds)

2700

#### Warm Down

4 x 50 swim easy @ 15 seconds rest

If you are not able to swim these workouts with an experienced coach on the deck and you are struggling with stroke rate, a tempo trainer can be a helpful tool, but, like any tool, overuse can turn it into a crutch. Try to develop a feel for your tempo and distance per stroke without the aid of any tools.

#### Suggested Drills

Water Polo Drill with Small Paddles and Short Fins:

Swim head up with short fins and small paddles with a focus on going as fast as possible for a 25. Pick a point at the other end of the pool and don't move your head. Grab the water as hard as possible when the paddle hits the water. Don't worry about the finish. If you try to finish the stroke with your head up and out of the water with paddles on, the paddles will come off while swimming. It is important to kick fast and maintain an engaged core without moving your head. Think about stability.

#### Rooster Tail Drill:

With fins on and swimming one 25 at a time, with 20-30 seconds rest between repeats, overemphasize the finish of the stroke. Flick the water at the finish to create a "rooster tail" in the air. Engage the core, ensure you push the water back, straight behind, and accelerate the hand from the start to the finish of the stroke. Start slow and finish faster.

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