

Swimming with your Body

There are three physical properties that govern all swimming technique. They are all important, complex and different. They are the properties of drag, motion and inertia. Of the three, the properties of drag are the most significant in terms of helping or hindering our speed. What about the properties of motion. In other words, what can we do with our bodies while swimming to aid our forward progress? Or can we do anything?

Imagine you are in space floating around and you spot a touch pad floating out there with you. How fast can you get to the touch pad? Or better question, how do you get there? You have nothing to push off of or pull against...just you in space.

You would figure out what worked in a hurry. One way would be to use your long arms as a lever and your shoulder as a fulcrum. Accelerating them into a wide circle swing then stopping (decelerating) them as quickly as possible in the direction of the touch pad. The further you could get the weight away from your body, the faster you could swing them and the faster you could stop the swing, the more energy would be transferred into forward motion.

Another way you might help yourself get there is that once you had established some motion toward the touch pad (say with your head pointing first and feet last), you would find that a sudden quick rotation and then a counter rotation, along the axis of your body, could also accelerate your motion forward, just as a bullet spins down the gun barrel.

Both of these motions help very good swimmers swim faster. The quick acceleration of the arm recovery (some today with a straight arm) and sudden deceleration of the arm as it hits the water, transfers energy to the forward motion. So does a quick rotation of the body.

There are two other compelling reasons why one should rotate the body to swim faster. The second is to put all of the muscles used in the arm pull into a more favorable mechanical position (stronger) and the third (and I believe strongest) reason has to do with stabilizing forces.

If a baseball pitcher can throw a ball at 90 mph from the pitching mound, the same pitcher would throw the ball at about 45 mph from the deep end of a swimming pool. The difference is that he doesn't have a stable pitching mound to push off of, so he loses half of his velocity. It is easy to visualize where our power comes from the start (pushing against the starting block) or the turn (pushing against the wall), but what creates the stabilizing force when we are out swimming in the middle of the pool? What are we pulling

against? The answer is the counter-rotation of our bodies and principally our core (hips and abdomen). We initiate our catch with the right hand at the very same moment that we begin to rotate our hips to the right (counter clockwise). That rotation continues until our left hand enters the water and we begin the counter-rotation to the left (clockwise). We repeat this motion over and over again. The quicker and longer we can make each hip rotation, the stronger the force we will generate in order to pull against. In other words, we create our own stabilizing force with motion from our own body to gain more power from the pull. It works.

Swimming flat, like a surfboard that grew arms and legs, is a much easier way to swim. It takes less energy....and if you were swimming across the Atlantic ocean, it would likely be the best technique to use. I call it the survival stroke...because it is the stroke we all tend to use when surviving 10 x 400 freestyles on 6 mins. Its just that with the survival stroke you can throw the ball at only 45 mph instead of 90 mph. If you want to swim fast, you'd better learn to swim with your body.

So our goals as swimmers in order to get fast are: 1) minimize the drag forces 2) learn how to swim with our bodies effectively and 3) take advantage of inertia.

Just remember, in swimming, little changes make big differences. At The Race Club, we focus on the little changes. And sometimes, the not-so-little changes.

Next, I will talk about inertia; what it is and how we try to use it. I call it 'swimming on the freeway'

Yours in swimming,

Gary Sr.