



SWIM LESSONS FROM THE WORLD'S BEST SWIMMERS

Perfect your stroke for your next race

Few people know more about swimming than Jonty Skinner, the Director of Performance Science and Technology for USA Swimming. In his position, Skinner spends a good deal of his time poring over swimming videos of the top swimmers in the United States, and the world, analyzing every detail of every swim stroke.

By utilizing underwater video in conjunction with the Dartfish software program, body position can be analyzed in great detail, including measuring specific angles. In a recent coaching clinic, Skinner talked about key swim technique issues in freestyle with video and data to back up his observations. Here he provides detail about freestyle swimming analysis and how his pool observations relate to triathlon.

BREATHING AND HEAD POSITION

The biggest problem in freestyle is created by the need to breathe. If we could just keep our heads down, freestyle could be much more efficient. Skinner noted that good head position is exacerbated in the swimming pool by the environmental effect of swimmers looking up to see who is coming toward them, how far they are from the swimmer ahead, and the location of the wall. Picking the head up automatically drops the hips. Skinner suggests that instead of trying to breathe at the same time you are catching a glimpse of the

next buoy, breathe first and then try to sight by only sneaking your eyes out of the water—your nose and mouth remain underwater. I tried this in the pool and was amazed at how much less my hips sank. Additionally, the stress on my upper body muscles was much less than when I was trying to breathe and sight on a target—getting my mouth out of the water. If you have been sighting and breathing at the same time, it will take practice to change the timing. Breathe first, take a stroke and then sight with only your eyes out of the water.

It is hard enough for most swimmers to get breathing on a single side correct. Bilateral breathing, or breathing on both sides of your stroke, is even more difficult for most swimmers. I am often asked if triathletes should always aim to bilateral breathe. I tell them it is good to practice bilateral breathing in workouts so they can sight to either side during a race. I think practicing bilateral breathing helps make the freestyle stroke more even and balanced, but if you are

faster and can swim with less energy expenditure by breathing to just one side during a race, do it.

Skinner agreed and his data on elite swimmers shows that some are slower in competition when breathing bilaterally. Even though there is the temptation to want to watch a competitor for every length of the race, by breathing on their non-preferential side there have been a number of cases where these athletes have actually lost ground to their competitors.

FRONT QUADRANT LOADING

Some triathlon coaches instruct triathletes to “finish your stroke” with a strong push past the hip while the opposite arm is just entering the water. There are two issues with this instructional sentence. First, the windmill-type approach to swimming where your arms are always opposite of each other is not efficient—it puts stress on small shoulder muscles and does not produce fast swimming. Second, from observations of elite swimmers, we know the longer the race distance, the less finish force is included in the stroke.

HIGH ELBOW VS. STRAIGHT-ARM PULL UNDERWATER

A high elbow and bent arm position is much more powerful than a straight arm pull because you are engaging larger muscles and getting more leverage. Try to get yourself out of the pool by not bending your arms to hoist yourself on deck. It is impossible. Now get yourself out of the pool the easiest way you can—I bet your arms are bent.

My example is, of course, exaggerated because your arm, hand and body positions are not the same exiting the pool as they are in swimming. But the example makes the point easier to grasp.

TEMPO VS. DISTANCE PER CYCLE

Swimming is similar to cycling and running in that there is an optimal cadence range for top athletes. For cycling, the optimal cadence is somewhere between 80 and 100 pedal revolutions per minute (rpm). If the pedaling rpm is too low, the athlete is likely mashing the gears, causing greater stress on the knees and more muscular fatigue. At the same time, spinning the pedals at 120+ rpm is good for powerful track sprinters going relatively short distances, but it does not work well for endurance cycling events.

World-class swimming cadence is typically 40 to 55 cycles per minute. A right arm entry to the next right arm entry equals one cycle. Top women are on the higher end of the spectrum and men are on the lower end. Because women are not typically as strong as their male counterparts, they utilize higher cadences to generate