

WHY TECHNIQUE MATTERS MORE THAN FITNESS

Multisport athletes are strongly inclined to work at swimming by doing more laps or working harder at them. Running and biking experiences make you think that more work is the way to get better. But swimming has more in common with such skill sports as tennis and skiing. Here's why:

- * It's the water that makes swimming different. Water robs the swimmer of energy and efficiency. With every stroke you take, the water is applying the brakes, trying to drag you to a halt, stealing energy from you.
- * Think about it this way: If you stand on the ground and jump into the air, you burn about 10 calories. Nine of those calories went directly into getting you off the ground. One was lost to the slight inefficiency of the muscular exertion. Because muscles contract by a ratcheting mechanism and that ratcheting action causes friction which creates heat--the reason we sweat when exerting ourselves--some of our calories are thrown off as waste heat. If on the other hand, you jump in the pool and swim a few strokes, burning the same 10 calories, only one of those calories would go directly into moving you forward; the other nine would be lost as waste energy because of the action of water drag.
- * Water is a frustrating medium for the person trying to move through it, and the nature of that medium makes the swimming puzzle far more difficult to solve than running and biking. Let's compare it with running. A runner, with each stride, gets to push off solid footing while moving forward through thin air. The swimmer, on the other hand, with each stroke has to push against a liquid that seems to do nothing but swirl away when you try to push against it. And to compound your difficulty, in propelling yourself forward, you have to thrust your body through a medium that is a thousand times denser than air. For a runner, this would be like trying to run across a field of Jello into the teeth of a gale-force wind.

Water is so effective at robbing us of efficiency that scientists estimate that even world-class swimmers are probably only about 9 percent mechanically efficient--91 of every 100 calories being robbed by water drag and the difficulty of pushing a hand against liquid. The novice swimmer may be only 1 or 2 percent efficient, as many as 99 of every 100 calories being stolen by the water.

Because stroke efficiency is such a big factor, the great performances of world-class swimmers are approximately 70 percent due to the efficiency, economy and coordination of their body position and stroking movements, and only 30 percent a factor of their power and physical conditioning. For the less experienced and less skilled swimmer, perhaps 90 percent or more of your performance will be determined by how efficiently or inefficiently you move through the water, while less than 10 percent will be determined by how fit you are.

Therefore, if you can swim a quarter-mile in 10 minutes, but would like to improve your time to nine minutes, only about five to 10 seconds might be gained by getting in better shape, while 50 to 55 seconds will come from learning how to move more efficiently through the water.

Greater stroke efficiency is a combination of two efforts: minimizing drag and maximizing overall propelling efficiency. Our next swim lesson will

discuss why minimizing drag is the more important of the two.
