



## Fish Like Swimming

October 14, 2002

Recently several people have asked me my thoughts on the Total Immersion clinics and training principles. And my response is: "I try not to think about Total Immersion." But every few years the Total Immersion Clinics and stroke technique "concepts" get some press or attention, usually in the triathlon community, so I need to address the "concepts". It must be that time again because I keep getting asked about Total Immersion Fish Like Swimming and swimming on your side.

Several years ago I wrote an article on "Fish Like Swimming" it was posted on the old DAMSWIM.com web page and later published in Swim Technique Magazine. Since sometime has passed I thought I'd repost the article in full for this weeks DAM Monday. If you remember it from the past reread you might learn something new. If you've never seen it before I hope it helps you with your understanding of the sport and how humans swim and move through the water.

For the next DAM Monday I'll address a few of the current "stroke technique" myths being taught at some swimming pools around the country.

Until then see you at the pool.  
Bobby

## Fish Don't Swim On Their Side And Neither Should You

Recent articles, books, videos and clinics have been flooding the masters swimming and triathlon communities promising to teach the secret to successful, fast swimming. These articles sound impressive, as they encourage us as swimmers to stop trying so hard and start feeling, sounds like the theme of a John Gray workshop. But as coaches we are informed that we have been teaching, and training swimmers incorrectly. We are told to swim fast, we must learn to swim on our side like a fish, and have and maintain a body position like a racing yacht.

Although some of these concepts have some merit and help beginner swimmers learn to relax in the water, they are not based on biomechanics, principles of propulsion, or the analyses of world-class swimmers. Since we are not built like fish and do not move through the water like a solid object, such as a racing hull, it is foolish to base stroke instruction and an entire training philosophy around these principles.

It has been stated, by the guru of "fish like" swimming, "the most hydrodynamically perfect position that your body can be in is balanced, lying on your side, one arm extended for length. Not so very different from the way fish do it."(1)

This statement drives me nuts! FISH DO NOT SWIM ON THEIR SIDE. If we take a look at a fish we notice a large fin sticking up toward the surface of the water. This fin is called the dorsal fin, dorsal means back or upper surface. The dorsal fin is on the fish's back, which means his back is up, and his front is down toward the bottom of his pond. The fish, it seems swims on his stomach not on his side. If you happen to see a fish swimming on his side you know that fish is dead in the water, the same way you'll be if you spend too much time trying to swim on your side. In truth the concept of fish like swimming lacks a bit in the common sense department. Have you see an article in Runners World, "Run Like A Cheetah... on all Fours." Can you imagine the break through this type of discovery would mean to the running world? We can learn a great deal from the observation of animals in their natural environment, but we should never forget we are not those animals.

As far as the hydrodynamic position described, it is based on the hydrodynamics of boat and racing shell hull design not on the human body. A swimmer is not a fixed object in the water and our bodies are not like the hull of a yacht.

Here are just a few of problems with the concept of fish like and boat like swimming.

1. When swimming freestyle most of the entire swimmer is underwater. Holding the body on it's side will not increase or decrease the amount of drag or resistance than what is created when holding the body in a prone position. (On the Stomach) Why? Because buoyancy, lift forces from the water remain the same no matter what the position of the body.
2. It is virtually impossible to generate propulsive forces from a long side stretched position. The muscles of the upper body cannot achieve efficient position to execute an effective freestyle pull, if the body is rotated to 90 degrees or to perpendicular with the bottom of the pool.
3. If a swimmer maintains a long stretched position "resting" as has been suggested (2) he will experience slowing down and speeding up. If a swimmer slows down and speeds up (negative acceleration and positive acceleration) he must overcome inertia. Newton's first Law implies more energy is required to overcome inertia than to maintain inertia. Therefore the swimmer who "speeds up and slows down" is wasting valuable energy repeatedly overcoming inertia.
4. Streamlining is not more important than propulsion. Keep in mind. If streamlining is improved and no change happens with propulsion the swimmer will get faster. If propulsion is improved and no change occurs with streamlining the swimmer will get faster. If both occur the swimmer will see the greatest speed increase of all. To eliminate one at the expense of the other is a waste of time and effort and will not result in successful swimming.

Since humans are neither fish nor boat, it does not make sense to try and copy either in an effort to gain improvement in the pool. This is not to say that a streamlined position is not desirable, it is. Dr. Brent Rushall editor of The Swimming Science Journal states it best "streamlining is very important but should not be emphasized at the expense of continuous force application."

The best approach to improving swimming is to learn from what the very best are doing. Here are a few characteristics current great freestylers have in common.

1. World Class swimmers have a maximum rotation of 45 degrees to the left and to the right. Not the "fish like" goal of 90 degrees to each side. (3)
2. World Class swimmers do not leave their arm extended for a long period of Time. The length of time the upper arm is extended for is "dependent on the Duration between arm recovery and propulsion."(4) Taller male swimmers all most always demonstrate this stroke characteristic. Jim Montgomery is a good example of this of stroke style, as is Ian Thorpe.
3. The best swimmers are good at streamlining and have effective propulsion. (5)

Swimming technique is not limited to any one aspect of the stroke. Swimming is a complicated sport where the athlete is suspended in fluid, and every action will create an opposite and equal reaction. (This is Newton's third law. Just in case you were wondering.) Sometimes the reaction is positive, other times the reaction results in technique flaws and hampers performance. Crawl stroke is a stroke that requires constant movement through a range of motion, no pauses should occur in any one position, especially if that pause detracts from or limits propulsive forces. To recommend swimming on ones side may reduce a small amount of resistance. I say may because most indications suggest that it is no different than swimming in a prone position. However the restriction and reduction of propulsive forces make it not worth the effort and in fact will harm performance.

One thing is certain; none of the great freestyle swimmers swim on their side. Fish don't swim on their side. And if you want to swim fast you probably shouldn't swim on your side either.

1. Laughlin, Terry, Delves, John. (1996) Total Immersion the revolutionary way to Swim better, faster, and easier, p 129.
2. Rushall, Brent. (1999) Carlisle Coaches' Forum. Body Dynamics in Crawl and Backstrokes: Myths Dispelled. Vol. 5, N 2.
3. Ibid.
4. Ibid.
5. Ibid.