

THE UNDERWATER PHASE Stay Under or Start Swimming?

At the recent USA Swimming Spring Nationals, the top two finishers in the Men's 100m Freestyle, Jason Lezak and Scott Tucker, both of Irvine Novaquatics, spent little time underwater after the start and 50m turn. In fact, they spent less time underwater than anyone else in the field.

However, at the Women's NCAA Division I Championships, superstar Natalie Coughlin, who set American records in Freestyle, Backstroke and Butterfly, typically dolphin'd underwater near the maximum 15 metres on each 25-yard length.

So what is best? Stay under and kick or pop up and swim?

There are several factors that determine what type of action a swimmer should use during the underwater phase of each length. While several general principles apply, variables relating to individual traits and abilities also play a role. Consider these factors in a Freestyle race that affect one's ability to find speed off the walls.

Strength of Push-off... obviously, a strong push-off will generate a burst of speed at the outset of the length. Other than the start, a swimmer is usually moving at a faster velocity at the push-off than at any other time in the race. Though all swimmers will decelerate from this initial burst of speed, the key factor becomes the amount and rate of deceleration in the transition from push-off to kicking and kicking to swimming.

Streamlining... the faster a swimmer moves off the wall, the greater are the resistive forces working against the swimmer. Streamlining plays a critical role in reducing these resistive forces and helping to reduce the rate of deceleration.

Depth... near the surface, the swimmer will encounter surface friction and turbulence. If a swimmer plunges too deeply off the turn, then the swimmer is likely to **climb** to the surface just before the first stroke. Optimal depth – in part – should be determined by how long and how effectively a swimmer kicks off the wall.

Type of Kick... particularly during Sprint Freestyle events, dolphin kicking underwater off starts and turns is growing in popularity. A Masters swimmer would be wise to determine whether his or her underwater dolphin or flutter kick is faster off a push-off. A few 8-yard time trials using these two kicks alternately should provide relevant data to help determine which is more effective.

Body Position... should the body be positioned on its side, its front or a combination of both during the underwater phase? It has been shown that kicking laterally off the walls may be slightly faster than kicking vertically.

Number of Kicks... top-level swimmers may take 10 dolphin kicks off the wall but this is after training the technique sufficiently, along with effectively developing the strength and speed in the kick. Masters swimmers should determine the effectiveness of their chosen kick and compare that with their initial swimming speed to determine the optimal breakout point.

Size of the Kicks... generally, faster kicks of smaller amplitude help to minimise the forward-moving surface area. Keep the body in a tight cylinder while kicking and allow the kicking action to venture just slightly outside of the surface area of the upper body. Dolphin-ing in this manner is different than dolphin-ing during a Butterfly stroke and should be trained as such.

Timing of the Kick... since maximum speed is obtained at the push-off, any immediate kicking, or enlarging of the surface area, can create additional resistive forces. Most elite swimmers will pause ever so briefly off the wall before beginning a kicking action.

Timing of the Stroke... just as important as the timing of the kick is the timing of the first Freestyle stroke. Taken too early, the swimmer is ploughing forward underwater and will likely catch water on the stroke's recovery. Taken too late and the swimmer risks losing speed due to surface pull.

Length of the Race... the demands of a specific race should be taken into account. For a 50-yard race, during which the aerobic demands are relatively low, an effective dolphin kicker may spend over half of the race underwater. However, in a 1,650-yard race, holding one's breath underwater for long periods may be very demanding and ineffective.

Some of these factors can be measured fairly accurately with a stopwatch or a trained eye to determine which suits a swimmer in a particular situation. More than likely, many decisions will be made by the **feel** of the swimmer – such as how deep to push off – what body position to use – when to start kicking – how long to use the kick – and when to take the first stroke.

Keep in mind that many of the skills used during a push-off can be developed and improved with practice.