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Why We Train with Equipment and When to Use It

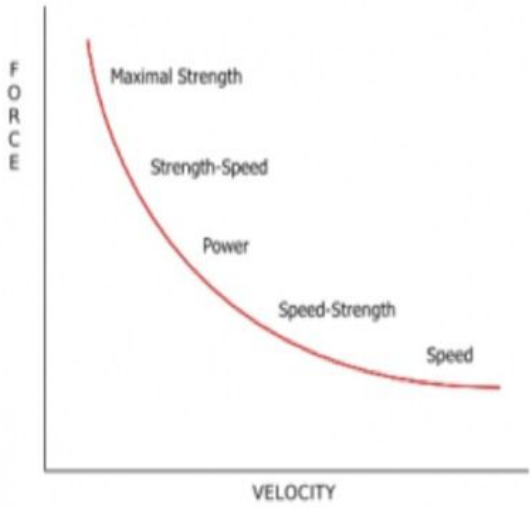
By Rich Williams

Nothing feels better than throwing on a pair of fins and slicing through the water at crazy speeds. Or, how about the sensation of putting on a pair of paddles and feeling your distance per stroke instantly lengthen? I remember a practice several months ago where one of my teammates who is new to swimming tried these tools for the first time. She was swimming with a much more experienced group, and exclaimed, "Wow, is this what you guys feel like all of the time?!" Indeed, these tools can make practice much more fun. However, in order to get the most benefit from them in terms of race performance, it is important to know why we use them, and the best ways to incorporate them into practice. Let's take a look at three important pieces of equipment:

FINS

When a muscle goes through the process of contraction, there is an inverse relationship between the speed of that contraction and the force that it generates. If you contract a muscle very quickly, the amount of force produced is minimal. Conversely, slower muscle contractions allow for more force generation. The graph to the right captures this phenomenon.

When you swim with fins, you are increasing the surface area that contacts the water at the end of your lower limbs. Assuming that your effort level with each kick is the same as when you swim barefoot, the increased surface area will slow down the rate of each downbeat and of each upbeat. This slower rate of turnover allows you to move further to the left of the force-velocity curve. As you generate more force with each kick, your muscles must adapt to this stimulus, and they become stronger over time. This positive training adaptation subsequently begs the question, 'why don't we just swim with fins on every set?' The reason is that we train not just for positive muscular and cardiovascular adaptations, but also for neurological improvements. If you trained exclusively with fins, your neuromuscular system would "learn" that turnover rate and would be unable to bring you to the "speed" position on the force-velocity curve when you need it in a race. For that reason, we should treat fins as a special occasion in our training, and they should be used to prepare for events where strength plays a significant role (i.e 100-500 yard events). Power events (50 yards) and endurance events (1000 yards) will benefit less from fins training. A simple set that will yield excellent results is 8x50 Freestyle Kick with a Board on an interval that allows for a 1:1 work to rest ratio. Complete the set holding the fastest possible average time per repeat – your legs will burn!



PADDLES

Paddles serve a very similar function for the upper body as fins do for the lower body. The paddle creates a larger surface area for the end of the upper extremities. This increased surface area decreases the rate of the pull, and therefore allows for more force production with each stroke. This increased load stimulates the muscles of the upper body to adapt with added strength over time. Paddles also have the theoretical benefit of improving stroke technique. The increased surface area makes you much more aware of the pressure that you feel against your hands. With proper coaching, you can use this feedback to improve each phase of the underwater portion of your stroke - the catch, the pull, and the push.

From a training perspective, the range of events that will benefit from paddle training is larger than the range that benefits from fins. The increase in distance per stroke and the improved stroke mechanics will serve distance swimmers well. Additionally, 100-yard

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to 500-yard swimmers will benefit from the strength improvements that come from paddle training. Pure sprinters should use paddles sparingly, as the slower hand speed will cause unwanted neuromuscular adaptations if overdone. If training for the 200, try a set of 10x75 with paddles where you attempt to hold within 1-2 seconds of your 200 pace for as long as possible on a work to rest ratio between 1.5:1 to 1:1.

PARACHUTE

The parachute is an excellent tool for sprinters. For those of you who are not familiar with this device, it is a small floating chute that is connected to a cord that wraps around your waist. It provides added resistance as you swim while also allowing you to keep your usual sprint form. Since your hands and feet are moving at the same rate as they would without the added resistance, the parachute allows you to move further to the right on the force-velocity curve towards power and speed training. The ensuing neuromuscular adaptation directly improves your attainable top speed.

The parachute also induces a metabolic adaptation to enhance your sprinting. Speaking broadly, within the body you use three different energy systems based upon the task at hand. You have an immediate energy system, an intermediate energy system, and a long-term energy system. When you begin a maximal-effort event like the 50 free, your

body uses the immediate energy system almost exclusively for the first few seconds. As the event progresses, there is a gradual shift towards the less-powerful intermediate system. As you improve your "sprinter fitness" you can extend your use of the immediate energy system and rely less on intermediate energy sources. The parachute helps to facilitate this adaptation by lengthening the amount of time on each repeat that you give a maximal effort without the interruption of a flip turn. If you are doing a set of sprint 25s, you are forced to hold that sprint effort roughly 20% longer. To put this into practice, an effective, yet very challenging set with a parachute would be 12x25 at 100% effort with an interval that allows for a 1:3 work to rest ratio.

As swimmers, we have a lot of tools at our disposal in our never-ending quest for faster and faster times. If you have not used this equipment for a while, dust it off and give it a try!

SCY 2020 Season Wrap-Up

The final Top 10 lists for the 2020 short-course yards season (SCY20) have been published. The season ran from June 1, 2019, thru May 31, 2020 and includes competitions that took place in 25y pools. Considering its shortened nature due to the Coronavirus, our LMSC had a great season: there were 164 ranked individual swims and 22 ranked relays our swimmers. There were 65 swimmers who had at least one Top 10 swim; Shirley Loftus-Charley led the way with 11 listings, followed by Greg Harris and Marcia Barry with 6 swims apiece. We had eight swimmers with top-ranked performances, including four by Fall Willeboordse. Seven relays ruled the waves in their respective age-groups, six by Club Tribe and one by VMST.

Despite the shortened season, the LMSC record book still had some new SCY record entries: 17 new individual records were set, with Fall Willeboordse and Marcia Barry setting the pace with three new marks apiece. Two of our swimmers also set new SCY records, with Austin Temple and Logan Burton setting one apiece in the 18-24 age group.

The mythical national championship rankings are based on scoring the Top 10 swims by zone, LMSC or club. As an LMSC, Virginia was ranked 10th out of the 52 LMSCs, just one point behind the 9th-place finisher. At the club level Club Tribe was our best performer, placing 11th out of the 330+ clubs with members who recorded Top 10 swims. Based on our population compared to other LMSC, we are definitely punching above our weight class. Congratulations to everyone who swam in a 25y pool last season, well done!

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