

5 SETS TO TRY BEFORE YOU DIE | THE BEST STREAMLINE | THE TRUTH ABOUT ICING

SWIMMING TECHNIQUE

JUNE 2016 • VOLUME 42 • NO 2

USRPT

THE HEAVYWEIGHTS SEPARATE
FACT FROM FICTION

AVICTOR

THE ULTIMATE ADVANTAGE.



MATT GREVERS | 4X OLYMPIC GOLD MEDALIST



HYDROSPHERE TECHNOLOGY

Leading-edge technology causes water to surround the fabric, rather than saturate it. The hydrospheric effect optimizes the swimmer's position in the water, thus reducing drag and maximizing speed and efficiency.



SPEED DRY FABRICATION

Proprietary coating repels water and keeps the suit dry and compressive, keeping swimmers lightweight and fast.



SUPERSONIC FLEX BONDING

Advanced engineering allows fully bonded seams to conform and stretch with the swimmer's body, resulting in a precisely fitted, ultra compressive suit that won't restrict natural movement.

MANUFACTURED IN THE U.S.A.
OF IMPORTED MATERIALS

TYR

In the new version of *Swimming Technique Magazine*, we are dedicated to bringing you the best information in the areas we feel are vital to swimming and coaching better. We've broken down our content in six categories, and every issue we will do our best to give info in each. The categories are as follows:

MP

MENTAL PREPAREDNESS

T/D

TECHNIQUE/DRILLS

N/R

NUTRITION/RECOVERY

WO

WORKOUTS

DL

DRYLAND

RS

RACE STRATEGY/PREP

So dive into our new issue, and we hope you enjoy *Swimming Technique*!

On the Cover: Lauren Boyle
by Robert Stanton/USA Today Sports Images

04 | The Importance of Technique For Swimmers

by John Leonard

06 | Using Warm Up to Improve Weaknesses

by Evan Dulaney

Leading a developmental group of 11-12 year olds, I realized our butterfly was in crisis. In terms of technique and speed, butterfly was the undisputed weakness of the group.

08 | How to Train for Long Course in a 25-Yard Pool

by Evan Dulaney

In a perfect world, every club would have the freedom to train long course all they want. There are numerous clubs that don't have the option to train long course, which begs the question: what's the best way to train for long course in a short course pool?

10 | URSPT - "A Statement of Conviction"

by Forbes Carlile

14 | REACTION TO SERGEI BELIAEV'S ARTICLE "ULTRA-SHORT RACE-PACE TRAINING"

by Brent S. Rushall, PhD

A reaction to Sergei Beliaev's *Swimming Technique* article, "Ultra-short Racepace training" from February 2015

20 | 5 Swim Sets You Have Try Before You Die

by Wayne Goldsmith

Swim sets are like burgers. There's a lot of them in the world: some are great, some are awful and some are just plain ordinary burgers. Here are 5 Swim Sets You Have Try Before You Die.

24 | The Best Swimming Streamline

by G. John Mullen

I've heard countless coaches suggest improving swimming streamline is the easiest route for swimming improvement, and I couldn't agree more. Often adjusting your swimming streamline takes very little extra energy, yet you swim faster. What a good deal!

26 | Writing to Learn in Swimming

by Richard Kent Ph.D.

Swimmers learn at different rates and in different ways just like baseball players, heart surgeons, and dancers. Learning theorists have long promoted the idea of diverse learning styles. But how do learning differences affect coaching, athletes, and performances?

28 | The Truth About Icing... What We Still Don't Know!

by G. John Mullen

Icing has been under scrutiny over the past few years and I'm a tad late on the whole icing debate. So why am I finally coming to the discussion?

30 | 2015 Aquatic Directory

Swimming World's annual Aquatic Directory with links to everything you'll need in the world of athletics.

**SEE OUR AQUATIC
DIRECTORY ON
PAGE 30!**



The Importance of Technique For Swimmers

Most swimming coaches are completely and totally devoted to teaching correct technique in strokes, starts and turns.

The reason is simple...our sport is a "TECHNIQUE LIMITED" sport. No amount of "motivation", "Training" or "athletic skill" can overcome the effects of poor technique in the water. Here is a quote from a talk I gave several years ago... *"A swimmer with good technique has NO LIMITS. A swimmer with poor technique has nothing BUT limits."*

It has been said that the greatest enemy of "great" is "good". When an athlete "wins" a race, with poor technique, it is a negative. They learn that a "reward" comes from the wrong source. Coaches look first, last and continually, for improvement in technique. We can never be "satisfied" with less than perfect technique. The best athletes in the world are obsessed with improvements in tiny points in their technique. So should all our athletes be.

The single most important thing to learn, is to get a correct breath. If we can't breathe well, we can't do anything else. So "bobbing" and how we get a breath in each stroke, is the single biggest key to improvement. Under pressure, confident athletes do not have to "think" about breathing...years of good breathing technique become the vital habit.

One more thing. When a human being learns ANYTHING, first, we learn it "mindfully". We focus on it and concentrate. (picture learning to drive a car, if you are an adult...) Once we can do it mindfully, we need to move to phase two, which is to do it "subconsciously". (after you had driven for 5 years, the car "drives itself" most of the time, right? But it took "5 years.") Finally, once we have mastered the technique subconsciously, the final phase is to be able to do it "under pressure" when we are tired, struggling, emotionally stressed, etc. In other words, in a "big race situation." The technique is not "learned" until it is present in this last set of circumstances.

HENCE, we put athletes under pressure in practice, to see what technique aspects "hold up" and give them practice in doing so. Practice should be "harder" in some respects, than any race the athlete will encounter.

This begins as soon as a child starts in swimming and continues for the rest of their swimming life. It also, obviously, has gigantic "life lessons" as a side result.

All the best,
John Leonard

SWIMMING TECHNIQUE

PUBLISHING, CIRCULATION AND ACCOUNTING OFFICE

P.O. Box 20337, Sedona, AZ 86341
Toll Free in USA & Canada: 800-511-3029
Phone: 928-284-4005 • Fax: 928-284-2477
www.SwimmingWorldMagazine.com

Chairman of the Board, President - Richard Deal
DickD@SwimmingWorld.com

Publisher, CEO - Brent T. Rutemiller
BrentR@SwimmingWorld.com

Circulation/Art Director - Karen Deal
KarenD@SwimmingWorld.com

Circulation Manager - Maureen Rankin
MaureenR@SwimmingWorld.com

Advertising Production Coordinator - Betsy Houlihan
BetsyH@SwimmingWorld.com

EDITORIAL, PRODUCTION, MERCHANDISING, MARKETING AND ADVERTISING OFFICE

2744 East Glenrosa Avenue, Phoenix, AZ 85016
Toll Free: 800-352-7946
Phone: 602-522-0778 • Fax: 602-522-0744
www.SwimmingWorldMagazine.com

EDITORIAL AND PRODUCTION

Editorial@SwimmingWorld.com

Senior Editor - Bob Ingram
BobI@SwimmingWorld.com

Managing Editor - Jason Marsteller
JasonM@SwimmingWorld.com

Assistant Managing Editor - Annie Grevers
AnnieG@SwimmingWorld.com

Graphic Designers - Joe Johnson, Emmi Brytowski

Staff Writers - Michael J. Stott

Fitness Trainer - J.R. Rosania

Chief Photographer - Peter H. Bick

SwimmingWorldMagazine.com WebMaster:
WebMaster@SwimmingWorld.com

MARKETING AND ADVERTISING

Advertising@SwimmingWorld.com

Marketing Coordinator - Tiffany Elias
TiffanyE@SwimmingWorld.com

MULTI-MEDIA

Writer/Producer - Jeff Commings
JeffC@SwimmingWorld.com

INTERNATIONAL CORRESPONDENTS

Africa: Chaker Belhadj (TUN)
Australia: Wayne Goldsmith, Ian Hanson
Europe: Norbert Agh (HUN), Camilo Cametti (ITA),
Oene Rusticus (NED), Steven Selthoffer (GER),
Rokur Jakupsstovu (FAR)
Japan: Hideki Mochizuki
Middle East: Baruch "Buky" Chass, Ph.D. (ISR)
South Africa: Neville Smith (RSA)
South America: Jorge Aguado (ARG),
Alex Pussieldi (BRA)

PHOTOGRAPHERS/SWTV

Peter H. Bick, USA Today Sports Images,
Reuters, Getty Images

ARIANNA VANDERPOOL-WALLACE
2008, 2012 OLYMPIAN

in control.

MASTER THE BASICS

FINIS introduced the first center-mount snorkel specifically designed for competitive swimming. Eliminating the need to side breathe, the **Swimmer's Snorkel** allows swimmers of all abilities to control body alignment, stroke mechanics, and fluidity.

FINISinc.com

FINIS[®]
simplify swimming

USING DAILY WARM UP TO IMPROVE COMPETITIVE WEAKNESSES

BY EVAN DULANEY, LEAD COACH - KENTUCKY CLIPPERS

Butterfly tends to be the inherent weakness of most age group developmental swimmers, and this became ever so apparent to me in a mid-November meet last short course season. In my first season leading a developmental group of 11-12 year olds, I realized our butterfly was in crisis. In terms of technique and speed, butterfly was the undisputed weakness of the group.

Following that mid-November meet, improving butterfly became imperative. It was something I fully intended to work on every day for the rest of the season, and I immediately knew the perfect place to install the butterfly work: warm up.

Warm up is an element of practice that can easily be overlooked, or at the very least, undervalued. It's typically used for its value in human kinetics; it has the benefit of preparing the muscles and joints for the upcoming practice. In addition, it stimulates the cardiovascular system for exercise. These elements are essential for the impending workout, but what about using warm up to directly improve results in competition?

The wonders of warm up are truly ubiquitous. The day after the meet, I made one minor change to our daily warm up routine that had a monumental impact. Every warm up for the rest of the season would end with a 100-yard butterfly "perfect." By "perfect," I simply asked the swimmers to focus on their technique, breathing pattern and stroke efficiency. There was no emphasis whatsoever on speed. Instead, the

emphasis lay, among other things, on low and straight arms, breathing every two, and an effective kick.

To many of the swimmers, butterfly was their mortal enemy, so they weren't thrilled with the new addition to warm up. They could, however, take solace in the fact that it was only four laps and there were no time intervals to worry about. This was key because it eliminated much of the anxieties some young swimmers have about fly.

The other key was repetition. Each and every warm up for the remainder of the season was punctuated with a 100 fly "perfect." Every single day, the swimmers had the opportunity to focus solely on their technique. Mentally and physically, they became inured to the demands of butterfly. It was no longer something to morbidly fear, as many 11-12s do. Besides conquering their fear of fly, their fly technique improved, as did their stamina. Technique is the foundation for faster swimming, so I was confident their times would improve.

In the previous short course season, before I inherited the group, one of the group's weaker butterfly swimmers turned in a 9% improvement her 50-yard fly. In between the mid-November meet and the swimmer's championship meet in February, she posted a 16.7% improvement in the same event. She was only hundredths of a second off the Ohio LSC Junior Olympic qualifying time. Some of this can be chalked up to natural development over a season, but to nearly double her improvement percentage from one short

[photo courtesy: PETER H. BICK]



course season to the next in a 50-yard fly is a large accomplishment for any swimmer. Much of that was rooted in the warm up routine because her technique drastically improved.

In another case, one of the boys in the group dropped only a second in the 100-yard fly over the course of the 2013-2014 short course season. In 2014-2015 campaign, he dropped nearly nine seconds while also just missing the Ohio LSC Junior Olympic qualifying time at 1:11.99. A separate swimmer exhibited a 14% improvement on her 100-yard fly in the most recent season.



These are just a few empirical examples of how four laps of fly in warm up dramatically improved the group's performance in the stroke. There were other swimmers with similar results. The daily repetition of butterfly allowed for a gradual improve-

ment of technique. In turn, that allowed us to train and perform fly faster and correctly. The kids, although they still don't love the 100 fly in warm up, credit it with helping their stroke and times.

Attacking weaknesses in warm up can extend beyond a single stroke. In a separate group I assist with, sprint events were our Achilles's heel. This group comprised of elite 11-12 swimmers was consistently proficient in the 100s, 200s, and distance events, but we didn't have the tempo and "get out" speed to fully excel in the sprint events. We rarely do sprint practices with our top 11-12s. Frankly, we don't see the benefit in limiting them to sprinting at such a young age. We prefer to prepare them for higher levels of swimming and tend to do more aerobic base training.

We looked for a solution to our sprinting problem in our daily warm up. We added more tempo work and sprinting to our warm up, typically in the form of 8 x 25 IM order fast tempo or a series of 50s focusing solely on tempo. By season's end, we saw significant improvement in our shorter events. One of our top distance swimmers (who's one of our weaker sprinters) dropped from a 28.13 to a 26.76 50-yard free in two months. Visually, the change in tempo was a night and day difference. An average backstroker went from a 35.11 to a 32.60 over the course of the season. Again, it looked as if the tempo shifted gears. Like the previous fly example, similar improvements permeated throughout most of the group.

Although these cases dealt primarily with 11-12s, this method can be effective for virtually any age group. Why? Focus and repetition. Placing importance on this specific aspect of warm up calls attention to it. The swimmers become more thoughtful with their approach. The repetition allows for gradual improvement, carrying with it the idea that it can be better than yesterday. Repetition doesn't have to be daily; it just needs to be consistent. The fruits of this labor will present themselves in competition. ◀



Short course and long course are two very different breeds of competition. Some may even go as far as to view them as completely different species. In a perfect world, every club has the freedom to train as much short course or long course as they want. Obviously, the best regimen for long course competition is long course training just like the best way to get better at three-point shots in basketball is to practice shooting threes. There are numerous clubs that don't have the option to train long course, which begs the question: what's the best way to train for long course in a short course pool?

Due to facility limitations, we train less than half of the already condensed long course season in an actual long course pool. The first two months of our long course season are spent practicing in a 25-yard pool. It isn't until early June that we're permitted to shift the bulkhead and stretch the length to 50 meters. This gives our age group swimmers just over a month's worth of long course training before championships, while our senior-level swimmers are granted only a couple of weeks longer. We know we're fortunate, though, because some teams don't have the luxury of training in a long course pool at all.

Needless to say, long course practice time is sacred. What we do in April and May, however, is just as important. We can't afford to wait until June to begin focusing on long course competition. By that time, the season is winding down towards championships. Our short course training is proactive in preparing for long course. Our attention to stroke mechanics, aerobic base training, race strategy, and leg work is key to enduring the longer competition pool.

The Perfect Stroke

The core focus in our program, regardless of season or age, is stroke mechanics. It's important for us to correct technique flaws in the early months of the long course season because a breakdown in technique does double the damage in 50-meter competition. Proper stroke mechanics not only reduce injury and increase efficiency; they also boost endurance. Where a swimmer can make up for stroke deficiencies in short course on turns, underwaters, and force, long course demands correct strokes. "Long course is like a fine-toothed comb," says head coach Norm Wright. Technique is imperative to lasting in a

long course race. Every minute detail in a stroke is magnified, so if a swimmer's stroke is breaking down in a 25-yard pool, imagine what will happen in a 50-meter pool.

Aerobic Base Training

Aerobic base training is at the heart of much of the Clippers' workouts. After stroke mechanics, we consider this the root to most of our success. Short course aerobic work also serves the best substitute for actual long course training. The attention to duration and volume translates well to the grueling demands of long course. This notion came into fruition at finals of NCSA Junior Nationals in March. Our swimmers had terrific success in the 50-meter finals without a single lap of long course training all season. Two specific examples are Madeline Vonderhaar and Brendan Meyer. Vonderhaar picked up her first Olympic Trial cut in the 200-meter breast, while Meyer earned his second Trial time in the 400-meter freestyle from the D-Final. Both of these events demand a strong aerobic base, so their success was evidence that our aerobic training is paying dividends.

Across the board, our approach to long course training in a short course pool doesn't vary too much from our normal short course regimen. "I really don't change things up too much from short course training," says head age group coach Chad Rehkamp. "I have tried different ideas and different strategies but the results all seem to be the same," he adds, "[But] the most success I've seen to this point is more aerobic base training." It remains our niche throughout the short course and long course seasons.

There are certain elements of aerobic training we tinker with when preparing for long course. Most of the changes pertain to duration and volume. Sets are subject to longer repeats, so we'll add more 200s and above. Set duration that may last 45 minutes in short course season would change to an hour in long course season. In addition, we'll sprinkle in speed work throughout the set to vary the intensity.

In May 2014, our highest performing 13-14s were given a 5000-yard aerobic base set that characterized an ideal long course prep workout. The set consisted of 800s, 600s, 400s, as well as 100s mile pace. Although the second repeat of the 800s, 600s,

and 400s were broken, the set still provided the swimmers an opportunity for longer repeats. The nature of the second repeat also allowed Rehkamp to emphasize speed in these longer swims. The mile pace provided a supplementary chance to work on controlled speed.

2 x 800 free 10:00(1:20)/11:05(1:23)
1-Negative split 2-fast :30 rest @ 400
2 x 100 free pace for mile +2 1:20
1 x 100 recovery 2:30
2 x 600 free 8:00(1:20)/8:20(1:23)
1-Negative split 2-fast :20 rest @ 300
4 x 100 free pace for mile +1 1:20
1 x 100 recovery 2:30
2 x 400 free 5:20(1:20)/5:30(1:23)
1-Negative split 2-fast :10 rest @ 200
6 x 100 free pace for mile 1:20

The motive behind adding volume and duration to sets in the early months of the long course season is to create the smoothest training transition possible. We want to hit long course training without changing our average distance. We'll do 7000-yard workouts in April and May to mirror the 6500-meter practices we'll do in June or July. This idea applies to entire workouts and individual sets. "We'll take a set we've done over the winter and add 30% to it so it mimics what we'll do over the summer," says Wright. Typically, this will come in the form of increased repetitions.

Wright's bi-weekly season plan demonstrates some of the aerobic base work our National Team does throughout the week, highlighted by Saturday's "overdistance" workouts. Even longer sprint workouts are predicated on an aerobic base by consistently topping 7500 yards and implementing the color heart rate chart. Each bi-weekly cycle is dedicated to a variety of swimming elements, but some form aerobic base training is the most reoccurring aspect.

Finishing Races

Our largest battle seems to be finishing long course races. In many of the different strategies we've tried in the past, the end of races remains the most consistent challenge. It's my personal philosophy that the last 25-50 meters of a race are determined by your training. In order to ensure we have back-half endurance, we implement a significant amount of race strategy into our workouts. Building, negative splitting, and descending are the fundamental strategies we work on in practice that allow the swimmers to simulate speed at the end of their race.

Looking back at NCSA Junior Nationals, Meyer was only two seconds away from even splitting his 400-meter free, and Vonderhaar posted a 0.7 second split differential on the final two lengths of her 200-meter breast. These splits didn't happen by accident. The swimmers' diligent work ethic compounded with race strategy training gave them the experience and endurance needed for a strong finish.

Legs, Legs, Legs

Arguably the most critical body parts in long course are legs. Although there are fewer underwaters, the value of kicking isn't diminished. Consistent legs throughout a 50-meter lap are essential to efficiency. In addition to race strategy training, maintaining a solid kick is crucial to finishing races. One set we give our highest performing 11-12s combines intense aerobic base training with some heavy-duty leg work. The set is one of my personal favorites:

4 x 200 free 100 kick/100 swim	2:50/3:00/3:15
1 x 100 recovery	2:00
4 x 200 free 100 kick/100 swim	2:45/2:55/3:10
1 x 100 recovery	2:00
4 x 200 free 100 kick/100 swim	2:40/2:55/3:10

The fast time intervals force the swimmers to effectively work both halves of the 200s. After exerting their legs for the first 100 yards, they have to swim the second half with tired legs. The high amount of repetitions builds a foundation for kicking endurance. This set is valuable from a physical and mental aspect. Physically, it helps the swimmer overcome fatigued legs, while succeeding in this set gives them the mentality that they'll have legs to finish a race.

In Wright's bi-weekly season plan, half of the morning workouts are dedicated to kicking. The variation amongst sprint kicking and long kick sets gives the swimmers a kicking arsenal for a wide range of events. Ideally, our swimmers will be able to use their legs as effectively in a 50-meter free as well as a 1500-meter free.

Using Meets

Our first long course practice is June 1, but we'll already have three long course meets under our belts by then. For teams forced to train short course, early season meets are prime opportunities to get long course experience. Historically, we've always swum two or three meets before beginning any long course practices. The races allow the swimmers to acclimate to the longer pool and set benchmark times for the remainder of the season. I view these early meets as some of the most important practices of the season.

Don't Change Too Much

The difficulty of training in a short course pool for long course is that it can never truly equal practicing in a 50-meter pool. But training shouldn't drastically change based on the length of the competition pool. Stick with what makes your program successful. "These things are all year," Wright says in regard to our training methods. Stroke mechanics, aerobic base training, and race strategy training have all yielded success in both short course and long course. This also creates continuity from season to season, which is best for the swimmers. And even after June 1, it's what we'll continue to work on until when we finally stretch the pool to 50 meters. ◀

URSPT

ULTRA SHORT RACE PACE TRAINING

"A Statement of Conviction"

by Forbes Carlile, Ryde, Australia, June 20, 2015

Special thanks to Bruce Wigo and the International Swimming Hall of Fame for coordinating this article.

My early training was in science. I worked first as a student then as a colleague with Professor Frank Cotton at Sydney University. In those years, "Prof" Cotton was one of the foremost applied physiologists working in sports and human movement. My education and work-association embedded in me two features of scientific discussion. The first was that "beliefs founded in objective facts can only be refuted by evidence founded in objective facts." The corollary of that premise is: "What can be asserted without evidence can also be dismissed without evidence." It is against the former assertion that I have concluded for some years that sport-related science now at last is capable of reviewing and evaluating coaching dogma and ignorance and exposing its remarkable extent. The second feature was that there are rules for argument. Those rules have not changed since the days of the Greek enlightenment. They require premises to be true and statements of fact to actually be steeped in objective observable and measurable data.

Honoring those concepts when evaluating suggestions, publications, and coaching proselytations, led me to often deny believing what swimming coaches have claimed and to continue looking for evidence-based coaching directions and behaviors. It has always proved fruitful for my wife Ursula and me to keep an open mind and consider activities of other sports and human behavior in general for suggesting better ways of coaching swimmers.

Unfortunately, there was a time, perhaps 30-40 years ago, when swimming coaches claimed that coaches were more advanced than scientists in understanding/knowing what best to do with swimmers. That is now completely outdated. The degrees offered in tertiary institutions, sport sci-

ence publications, and active very experienced scientists, have led to an information explosion that has outstripped persistent dogma and shown to be irrelevant much of swimming coaching education. I rejoice in this being the time of answers being available to most questions that are pertinent to effective swimming coaching.

We have also seen the rise in sport scientists with impeccable credentials and productivity involved in improving coaching and sport/swimming participation. Professor Tim Noakes of the University of Cape Town and Professor Emeritus Brent Rushall of San Diego State University are but two who spring into my mind. A distinctive characteristic of both gentlemen and others is the underlying belief that much of what is being used today as coaching knowledge and practices will be shown to be mostly wrong in the future (20-25 years time is often mentioned). It has long been thought that a central responsibility of universities has been to predict and evaluate what society will be like in the future. It is only productive to follow that focus and generally evaluate what we can do better as coaches. Being closed-minded to new ideas is a characteristic of humankind that does not serve much purpose other than in religious domains. Max Planck observed:

"A new scientific truth does not triumph by convincing its opponents and making them see the light but rather its opponents eventually die and a new generation grows up that is familiar with the truth."

Today we see another instance of the tussle between the uninformed and the scientist in the hysteria surrounding Ultra-short Race-pace Training (USRPT). Much of the original development of this most recent model occurred

in recent years at Cherrybrook Carlile Swimming Club. The head coach there, Greg McWhirter (who has been associated with Ursula and me for more than 30 years), evaluated one facet of USRPT, that being its effect when compared to slower-longer distance swimming tasks on the motivation of age-group swimmers. The preference was ostensibly unanimous in indicating USRPT as being preferable, more relevant, and more enjoyable than traditional age-group coaching dictates. Greg's investigation earned him a Gold Coaching License with Australian Swimming.

USRPT was formulated by our long-time associate (now in excess of 53 years) Professor Brent Rushall. Always steeped in science and applying scientific methods in practical settings where possible, Brent impacted the performances of swimmers from the 1960s at the Forbes and Ursula Carlile Organisation. While Ursula and I were coaching the Dutch Swimming Team in the years before the Tokyo Olympics in 1964, Brent directed our swimmers and programs during our Winter. We placed four swimmers on the Australian Olympic Team partly because of the introduction of a technique-based winter training program, it being the first of its kind to our knowledge anywhere.

We were fortunate to keep in contact with Brent when he left Australia to attend Indiana University and serve as a research-associate, doctoral student, and confidante of the late "Doc" Counsilman. From then on, his involvement in Canadian sport, particularly in swimming with the then Head Coach Don Talbot, was associated with further advancements in swimming science and performance. Although trained in work physiology at Sydney and Indiana Universities, it was primarily in the realm of performance psychology and almost to the same extent biomechanics (movement efficiency and effectiveness) that he scientifically demonstrated new directions and the reasons for discarding old beliefs in those two under-emphasized areas of swimming coaching. Much of modern day thinking, particularly amongst administrators with a smattering of coaching experience, still has to catch-up with what is known to improve swimmer performances in those two areas of science.

The current anti-USRPT dogma that is given fair voice in print and on-line publications explains who and why swimming performances seem to be stagnating in several countries. Were it not for a few remarkable performers on national teams, the spread of mediocrity might be recognized.

For the past 10+ years, Ursula and I have questioned Brent about new revelations through science that contravene conventional coaching "wisdom" (or lack of it). Consistently, we were swayed. USRPT is built on scientific evidence, not some crack-pot ideas. It is because of their ignorance that many are hesitant to admit to error. We find it very difficult to understand why anyone would not grasp all the facets of USRPT. It is scientifically born and eliminates much of the irrelevance of the modern-day swimming experience. For those who use it wisely and knowingly, the reports of successes and delights are emerging more each day.

This is not the first time that Dr. Rushall has been involved in controversy with regard to swimming knowledge. In the early 1990s, he spent two years as Director of Coaching for New South Wales swimming. In such a role, he performed educational duties through publications, courses, and consultations. Coaches Paul Hardman and Greg McWhirter, NSW Swimming Coaching Coordinator Neil Ryan, Ursula and I were exposed to Brent's evidence and physics theory that debunked lift as the important element of swimming propulsion. The technical people and coaching leaders at that time in Australia demanded Brent be "fired" because of his wrong (read heretical) teaching. Working with Coach Hardman and to a lesser extent Coach McWhirter, Carlile swimmers rose to supremacy in Australian swimming through the introduction of technique and psychology practices. These include multiple world record holders, Karen Moras, Shane Gould, Jenny Turrall and others and was voted onto the International Swimming Hall of Fame in 1976.

In 1994, three colleagues and Brent published an article debunking the Bernoulli Principle for swimming propulsion. Dr. Joel Stager of Indiana University opted to publish it in the Journal of Swimming Research despite it being contrary to conventional beliefs. The late Brian Counsilman wrote an article published in an ASCA newsletter. Brent asked if he could write a rejoinder pointing out the errors. This was refused. I don't think ASCA was pleased that Dr Stager published the article. ("It was all wrong"). Dr. Ernie Maglischo apologized to all who would listen (I think it was ASCA 1995) in saying he had been wrong after championing the "S shapepull" in two additions of his famous Swimming Textbook. All those years he had been talking about lift but Rushall and co researchers were correct. But American Coaches took a long time to change their minds. Similarly, when Brent gave his "myths" address at ASCA 2009 (in retrospect I think John Leonard invited Brent through my persistent hounding), he point-

ed out six things (<http://coachsci.sdsu.edu/swim/bullets/ASCA2009.pdf>). A response to me was "we already knew that". Many conference presentations still perpetuate those myths as dogma.

The point behind this long historical perspective, and given my 94 years I have a long perspective, is that swimming has not kindly accepted new science and the implications for improving swimming coaching and performance. Unfortunately, it is a *case of beliefs founded in objective facts being contested by dogmatic beliefs*.

When talking about USRPT, Ursula, Brent, and I decided that it would be best to write many supplementary articles and descriptions of the development of the coaching formula so that there would be no misunderstandings. Unfortunately, few have read the extensive supplements and explanations (<http://coachsci.sdsu.edu/swim/usrpt/table.htm>) that are intended to further the comprehension of USRPT. The lack of understanding is commonly revealed in the treatment as if USRPT was only a conditioning model. Nothing could be further from the truth. Recently, USRPT was defined/described thusly:

USRPT is a technique-oriented system that uses a particular training format to maximize the opportunities for learning race-relevant techniques. Its second priority is to make coaches good teachers so that they can assist swimmers in changing their relevant techniques. Thirdly, since psychology determines the outcome of races, that has to be emphasized. Finally, conditioning is limited to inherited abilities and can be accomplished fastest and most effectively by ultra-short training.

Where are the critiques on the technique, psychology, and pedagogy emphases? They are not mentioned because I am sure the critics have not read enough to fully understand what USRPT is.

I shake my head in wonder at "Here we go again." As Johnathan Swift in 1706 wrote "When a true scientific innovator appears in the world, you may know him by this sign, that the dunces are all in confederacy against him." USRPT is founded in science. Unfortunately, recent researches have not supported many of established coaching procedures in conditioning, technique, or psychology. Few coaches are effective teachers of technique for they are not trained in pedagogy or the teaching of human movements.

Any coach not willing to take the time to learn, understand, and implement USRPT in its entirety will not do

the best job of coaching swimmers. There will always be the observation of "Great swimmers make great coaches" without any consideration of how many swimmers do not turn out great, or even improve, and in some cases fail under that coach. A coach has to take responsibility for failures as well as successes. Since USRPT is individual-centric, failures will be few and the successes will be many.

USRPT is the most explained and described coaching model for swimming that I have come across in my long history of involvement in swimming. Sometimes Ursula and I wish we were younger so that would becoaching on deck the USRPT way. There is no doubt how much more successful we would have been in our careers had that been possible.

In the Carlile organization we have always prided ourselves on our collegiality and accumulated knowledge. Consequently, it is appropriate for the final summary of this article to be a quote from our longest serving coach, Greg McWhirter. It speaks as much for Ursula and me as it does for our other coaches.

USRPT works because it envelopes the total organism in a specific stimulus for a specific performance. Much of traditional training categorizes training effects whether they be cellular, mechanical, or psychological. That piecemeal approach, although easy for "experts" to identify, usually in a laboratory, seems to focus on singular changes in an athlete when exposed to training. It does not recognize the most important truth: it is the race that coaches, swimmers and scientists should aim to improve. A race involves all facets of an organism's ability and it is a race that ultimately should be the evaluation of how coaches have delivered training and practices. It is the specificity of training that provides a solid platform for race improvements and USRPT is the only stimulus that adheres to the rules of specificity for the total individual's requirements for race adaptation and therefore improves an individual's race performances. ◀

Respectfully submitted,
Forbes Carlile
June 20, 2015

Footnote: I would like to thank Ursula Carlile and Greg McWhirter for their more than substantive contribution to the development of this statement.



custom

WO

RS

REACTION TO SERGEI BELIAEV'S ARTICLE "ULTRA-SHORT RACE- PACE TRAINING"

by Brent S. Rushall, PhD, R.Psy.(ret)
SAN DIEGO STATE UNIVERSITY

This paper constitutes a reaction to Sergei Beliaev's Swimming Technique article, "Ultra-short Racepace training" (February, 2015, pp. 5-7; <http://magazines.swimmingworld.com:9997/St/MagazinePDF/201502.pdf>).

When considering popular concepts, it is always worthwhile to consider negatives as well as the positives about the entity. However, the original source and subsequent alternatives about ideas need to be evaluated for validity and reliability. Standards for criticisms are equally as important as the presentation standards of any original article(s).

There are extensive articles about Ultra-short Race-pace Training (USRPT) posted free to the World Wide Web (WWW) at <http://coachsci.sdsu.edu/swim/usrpt/table.htm>. Each article is meant to expand or clarify aspects of the USRPT swimming coaching concept. The large majority of the contributions are written by this author. The general site, *the Swimming Science Journal* (<http://coachsci.sdsu.edu/swim/index.htm>) has been sponsored by San Diego State University, specifically the School of Exercise and Nutritional Sciences (<http://ens.sdsu.edu/>), for the past 20 years. The posting of items to that site must maintain academic standards, essentially those of the National Science Foundation and in this writer's particular case, the national psychological associations of Canada, the USA, and Australia. Periodically, contributions and postings are evaluated blindly in-house to consider whether the academic standards are maintained with regard to structure, content, and reasoning/logic. The web site would be removed if it was not of a standard that adequately reflects the academic standards of one of the best small research universities in the USA. Essentially, a reader can rely on the content presented particularly because of the need to indicate data-based reference sources that are of a scientific nature.

Anyone who criticizes USRPT should respond with valid and reliable information and arguments. This reaction paper evaluates some of Sergei Beliaev's comments according to those reasonable standards.

For a period of time, Sergei Beliaev was inaccurate when

referring to USRPT. Figure 1 duplicates part of an announcement about a clinic offered by Sergei Beliaev in September, 2014. He termed the RP of USRPT as "Rest-Pace Training" rather than race-pace training. Thankfully, by now Sergei Beliaev has learned the correct name of the entity about which he speaks. This is the first clue that raises the suspicion that perhaps the clinic conductor might not be accurate in his depiction of USRPT because he did not even know its correct name for some time.

While the *Swimming Technique* article provides references in its text, it does not include a bibliography of those attributions and so there is no way of knowing whether or not there actually is support for Beliaev's content. It is not a rare event that people include unattributed or false references in the bodies of non-academic articles to make their contents seem more credible.

Sergei Beliaev immediately launches into labeling USRPT as "*Parametric Training*" (p. 5). Unfortunately, as will be implied later, USRPT is extremely multivariate which is moderated by a subset of those variables depending upon the individual nature and potential of any swimmer. There is nothing implied or assumptive about those variables, the basic requirement for the declaration of one or more parameters. The most basic parametric entity is usually of the form $y = ax + c$ where "x" is the parameter or variable that has certain characteristics, for example, it exists as a normal distribution within a population when attempting to predict "y" from the known number "a". USRPT is extremely complex when compared to other coaching models, particularly the limited factors referred to in the Beliaev article. The potential factors of technique, pedagogy, psychology, and swimming-fitness development propose suggestions for a coach's consideration when determining the individual requirements for the enhanced development of swimmers. In a mathematic/statistical sense,

which is the correct environment for declaring behaviors/entities as being parametric or non-parametric, the disregard of quantification of USRPT factors renders it, if one must use a probably incorrect label, as being "non-parametric". Beliaev's suggestion for a label suggests a failure to understand USRPT as described by Rushall (2015). It has been reported to this writer that "Parametric Training" is being discussed in swimming coaching circles. Because of the individuality of swimmers in a multivariate environment, any concept of effective training will not be represented by a mathematical model. It has been tried as TRIMP scores, an innovative development by Professor Eric Bannister of Simon Fraser University (Canada) in the late 1970s. TRIMPS correlated moderately with running load expressed as imprecise physiological measures (Rusko, 2004). When used for overall performance, it was of little value (Hellard et al., 2006; Savage et al., 1981). If one hears of USRPT as being a variation of "Parametric Training", it can rightfully be asserted that "they know not what it is about which they speak."



Figure 1. A section of an announcement about a clinic to be offered by Sergei Beliaev where incorrect words were used as an expansion of USRPT.

It is stated that USRPT is supposed to explain "how long athletes need to stay in specific training zones" (p. 5). The stipulation that there are training phases for developing athletes is a theory, not based on scientific evidence, which developed mainly in the Eastern Bloc countries from the 1950s onward. That speculation evolved into a number of labeled theories and their variations often indicated as "periodization", which is mentioned in the Beliaev article.. This writer has extensive experience with that theory and its variants (Rushall, 1984; Rushall & Pyke, 1991). Unfortunately, periodization died a natural death when it was pointed out that it did not accommodate all athletes in all sports (Issurin, 2008).

The drawbacks of periodization have been listed (<http://coachsci.sdsu.edu/csa/vol161/issurin.htm>). The class of Soviet/Eastern-Bloc training theories, to one of which Sergei Beliaev alludes, has been dressed up as long-term "periodization". However, it is largely irrelevant for today's 12-month trained swimmers/athletes. Issurin highlighted four weaknesses of the traditional training/planning model, as exemplified by Sergei Beliaev, that contradict the demands of modern competitive programs.

- *An inability to provide multi-peak performances during the season/year;*
- *the drawbacks of long-lasting mixed-training programs;*
- *negative interactions of non-compatible workloads that induce conflicting training responses; and*
- *insufficient training stimuli to help highly qualified athletes to progress (as a result of mixed training).*

Contemporary training theory, of which USRPT is an example, now accommodates:

- *Frequent peaks within a year of competitions,*
- *a focus on very specialized training effects (largely specific velocity training with a marked reduction in irrelevant or "basic" training experiences) attained through a block of training over a relatively short period, and*
- *the recognition that swimmers have a continual state of general fitness upon which a block of specialized work superimposes specialized training effects*

A suggested new structure for training continually-adapted athletes was suggested by Rushall and Pyke (1991 – Chapter 17: Team-sport Training). That description applied to Australian Rules Football and was re-interpreted for swimming in Rushall (2014a – pp. 44-47).

Sergei Beliaev's adherence to long outmoded training theories is well known, particularly to those who attend the International Swimming Coaches' Association's annual convention.

On page 6 of the Swimming Technique article, Sergei Beliaev offers the following opinion about USRPT:

How valid are the claims?

USRPT authors make quite a few claims that are not entirely correct. According to Dr. Rushall ("Swimming in 21st Century," Swimming Science Bulletin), USRPT produces the following benefits in comparison to "traditional" (anything not USRPT) training:

That quote is followed by Figure 2. Beliaev opines:
When these claims and comparisons are examined in depth, most are found to be at best only "partially true," while a few are simply misleading.

Sergei Beliaev then goes on to state the most outrageous forms of developing power, speed, using as references the opinions of others and thereby committing the unacceptable strategy of appealing to non-data-based authorities for support of a set of spurious beliefs.

What is disturbing is that the table in Figure 2 has been falsified. It is another indication of the lack of precision in Sergei Beliaev's communication.

In the body of his article, Beliaev infers that supportive research does not exist for USRPT. Figure 3 illustrates a section of an article by this writer comparing USRPT with traditional training on quite a number of factors normally of interest to swimming coaches (Rushall, 2014b). It is apparent that Figure 2 is derived from the same table as in Figure 3 (pp. 2-3). What is worrying is that Sergei Beliaev has removed the fourth column titled "References" from the source table. Since the removal of that important column does not allow one to assess if there is any support for the data-based attributes of USRPT, one is left to assume that perhaps there was a deliberate attempt at reader obfuscation through the purposeful removal of important information by Sergei Beliaev.

Feature	USRPT	Traditional Training
Trains race physiology/fitness	Yes	No
Trains physiological capacities better	Yes	No
Primarily uses alactacid and aerobic energy	Yes	No
Varying work-to-rest ratios produces different metabolic responses. [Mixed sets are bad.]	No	Yes
Produces largest volume of beneficial work	Yes	No
Produces greatest energy expenditure	Yes	No
Produces better carbohydrate and fat utilization	Yes	No
Best developer of aerobic adaptation	Yes	No
Needed to improve maximal accumulated oxygen deficit	Yes	No
Best for developing lactate tolerance	Yes	No
Best for developing power	Yes	No
Conditions swimmers better to race	Yes	No

Figure 2. A table from Sergei Beliaev's article ostensibly to support his claim that USRPT does not produce many changes and is based on insufficient evidence.

The numbers in the References column of Figure 3 indicate the reference number in the reference list at the end of the Rushall (2014b) article. It can be seen that on some factors there are extensive references supporting the better effects of USRPT when compared to traditional training, an example of which is partially explained "as the way to do it" on page 6 of the *Swimming Technique* article.

A reader has to decide if the statements of Sergei Beliaev and their distortions and inaccuracies, and deliberate falsifications of an evidentiary table, are more reliable than those that give the references upon which they are based (i.e., this author's USRPT articles).

Most of the references used by Sergei Beliaev are very old (more than 25 years). Only one author is repeatedly referenced in the 2000s. That must be compared to the recent dates of the majority of articles in this writer's papers (the majority are after 2000 and up to 2014). That fact alone serves to stamp the basis for Sergei Beliaev's arguments as being outmoded and when the inaccuracies/imprecision of his content are considered alongside that of USRPT or its component's data-based attributions, the reliability of the *Swimming Technique* article should be deemed unacceptable. Although *Swimming Technique* is not an academic publication, one should expect to read valid and reliable information as a consequence of subscriptions. Advertisers

surely must expect to be associated with trustworthy information. If one wanted to see good and bad content in the *Swimming World*, contrast the Beliaev article with the data-based article authored by Dr. Rod Havriluk (2015) immediately following it.

What is the value of publishing misleading and deceptively written articles? In this 21st century, there have to be advancements over the swimming training theories of 30-50 years ago.

One other criticism of the type of talk in which Sergei Beliaev engages is that the theories developed in the USSR and other Eastern Bloc countries from the 1950s to even the present day were not reliable. How can one advocate that there are certain methods of how athletes should be trained when those methods are based on programs that used performance-enhancing drugs (PEDs) extensively (Kalinski, Dunbar, & Szygula, 2001; Kalinski et al., 2002; Kalinski, 2003)? How much were performances enhanced by the training methodology and how much were they influenced by the PEDs? We will never know.

Sergei Beliaev mentions several principles within his article. Some are well known, for example the Principle of Specificity. In this writer's opinion, two quoted principles stand out as being unusual in sport. A Google search indicated 20K hits for the "Principle of Pendulum". However, the first four pages of WWW references pertain to physics and not exercise disciplines. It does not seem to be a high-use concept in sports, if at all. The "Principle of Skills

TABLE 1. COMPARISON OF USRPT AND TRADITIONAL TRAINING ON A NUMBER OF TRAINING AND SWIMMER FEATURES.			
Feature	USRPT	Traditional Training	References ²
Trains race physiology/fitness	Yes	No	25; 43; 57
Trains physiological capacities better	Yes	No	1; 5; 14; 22; 23; 24; 45; 47; 59; 61; 64
Primarily uses alactacid and aerobic energy	Yes	No	15
Varying work-to-rest ratios produce different metabolic responses. [Mixed sets are bad.]	No	Yes	19
Produces largest volume of beneficial work	Yes	No	2; 60
Produces greatest energy expenditure	Yes	No	52
Produces better carbohydrate and fat utilization	Yes	No	54
Best developer of aerobic adaptation	Yes	No	10; 37; 58; 63
Needed to improve maximal accumulated oxygen deficit	Yes	No	62
Best for developing lactate tolerance	Yes	No	9

Figure 3. The complete table width of most of the original material corresponding to Sergei Beliaev's table in his *Swimming Technique* article. The removal of the reference column would not allow readers to assess the scientific validity of the comparative statements.

Acquisition" only yields four hits in Google. One of those is the *Swimming Technique* article in question. These low use terms could obscure dubious content and are but one more indication of the spurious nature of Sergei Beliaev's claims and language.

Even the manner in which Sergei Beliaev refers to the Principle of Specificity with regard to USRPT is wrong. He infers that USRPT was written to conform to the principle. That is untrue. USRPT developed over a nine-year period from an extensive review of scientific work (from the 1930s on) mostly in competitive swimming but also in other sports (e.g., kayaking, rowing/sculling) of a like category. The conclusions of that review were stated to include the external validity of those articles. Only when those conclusions were contemplated was it of determined that the research considered strongly supported the *Principle of Specificity*. USRPT was not developed to

conform to specificity; it only turned out that way. It is in the realm of motor skills learning that Sergei Beliaev fails miserably. His statements about skill learning are contrary to what is known about skill acquisition and pedagogy (Rushall, 2006; Rushall & Ford, 1982; Rushall & Siedentop, 1972). He repeats several of the spurious learning ideas incorrectly propagated in the swimming literature (see Rushall, 2013 and the critique of the recent false directions adopted by British Swimming). A particular example is the advocacy of learning techniques by swimming slow. In the 1930-1940 era of motor learning, there was a debate called the "speed versus accuracy dilemma". Essentially, it involved pondering whether to teach skill-elements first and then elevate performance to a desirable level or does one have an athlete perform at the desirable speed (effort-level) first and then hone skillelements at that speed. The debate ended early in the 1950s in favor of speed first and then the introduction of technique elements at the desired velocity/effort-level. It is clearly evident in the research literature that swimming techniques vary with velocity, that is, as a swimmer increases forward velocity techniques change to accommodate the new and different requirements of the changed velocity (Rushall, 2009). The correct technique for swimming at 1.9 m/s cannot be learned at 1.3 m/s velocity. The neural activation patterns in the brain are very different for both velocities, the activation, timing, and extent of muscle use are different, and the swimmersensations of both are also very different and discriminable. The swimming dogma of introducing technique concepts at low velocities and practicing them at low velocities is false and erroneous for producing improvements in serious swimmers. It is interesting that Rod Havriluk's article (2015) also made the point about the uselessness and dangers of slowswimming for technique development. He even stated that it would be undesirable for learners. One could also take an inferential leap and assert that an implication from Havriluk's work is that slow-swimming and drills are where the undesirable catch-up-stroke freestyle technique is developed. Dr. Havriluk also added that the catch-up stroke, which is exhibited by many top distance and slow-swimmers alike, is a source for shoulder injuries (e.g., *swimmer's shoulder*).

It is acknowledged that slow-swimming has its advantages but they are restricted at best to learn to-swim individuals and not swimmers in serious training. Slow-swimming instruction is productive in beginner-learning environments when it is used to introduce stroke elements and developing confidence for swimming long distances. It is counterproductive in advanced training situations. There

is a science of instructing intellectual and motor skills that is called "pedagogy". It has been elucidated for swimming (Rushall, 2011). Sergei Beliaev would do well to read that resource. This writer recommends that any discussion by Beliaev about skill learning and instruction in the *Swimming Technique* article be disregarded.

USRPT has four components. In order of importance they are: i) Technique, ii) Pedagogy, iii) Psychology, and iv) Conditioning (Rushall, 2015). Those four components are interrelated.

A valid critique of USRPT should address the totality of those concept factors. To not address them could indicate a possible lack of the writer's awareness of USRPT as it should be implemented or a ruse to mislead a reader. Sergei Beliaev does not address the preferred first three of the four USRPT components.

One could go on paragraph by paragraph and refute the statements made by Sergei Beliaev in his *Swimming Technique* article. It is hoped that if *Swimming Technique* publishes other articles about USRPT that the authors will have read and assimilated the information that exists about it. It is deceitful and of no value to anyone other than perhaps the author to criticize an entity when one does not know its correct name or what it entails. The information that exists on the WWW in the *Swimming Science Journal* is scientific because it is based overwhelmingly on data-based presentations and publications. By adhering to scientific standards for information reporting and the interpretation of investigations on defined topics, the generalizations that have been developed for USRPT can be deemed reliable and valid at least to the date of the most recent study used to support one or more causal relationships. That cannot be said about Sergei Beliaev's proposals and criticisms.

Unfortunately, *Swimming Technique* erred by publishing Sergei Beliaev's article that is misleadingly critical of USRPT. The *Swimming Technique* editors and authority have to question the social value of publishing such information. It is a departure from the usual standard of validity in articles it usually presents. However, the publication of this reaction is a positive step because it allows some balance in the discussion of USRPT. Readers are free to adopt or reject using USRPT. It is disappointing that mostly unqualified individuals try to convince readers not to try USRPT by using unvetted blogs and bulletin boards concerning swimming. *Swimming Technique* has demonstrated its duty to present both sides of a modern-swimming story. ◀

References

- Beliaev, S. (2015). Ultra-short race-pace training. *Swimming World*, 42(1), 5-7. [<http://magazines.Swimmingworld.com:9997/St/MagazinePDF/201502.pdf>]
- Havrilluk, R. (2015). Catch-up freestyle. *Swimming World*, 42(1), 8-9. [<http://magazines.Swimmingworld.com:9997/St/MagazinePDF/201502.pdf>]
- Hellard, P., Avalos, M., Lacoste, L., Barale, F., Chatard, J., & Millet, G. P. (2006). Assessing the limitations of the Banister model in monitoring training. *Journal of Sports Science*, 24, 509-520. [<http://coachsci.sdsu.edu/swim/training/hellard.htm>]
- Issurin, V. (2008). Block periodization versus traditional training theory: a review. *Journal of Sports Medicine and Physical Fitness*, 48(1), 65-75. [<http://coachsci.sdsu.edu/csa/vol161/issurin.htm>]
- Kalinski, M. I., Dunbar, C. C., & Szygula Z. (2001). Research on anabolic steroids in the former Soviet Union. *Medicine and Science in Sports and Exercise*, 33(5), Supplement abstract 1901.
- Kalinski, M. I., Dunbar, C. C., Gavronski, W., & Szygula, Z. (May, 2002). Evidence of state-sponsored steroid research using human subjects in the former Soviet Union. Sixth IOC World Congress on Sport Sciences, abstract, p. 37.
- Kalinski, M. I. (2003). State-sponsored research on creatine supplements and blood doping in elite Soviet sport. *Perspectives in Biology and Medicine*, 46(3), 445-451.
- Rushall, B. S. (2009). The Future of Swimming: "Myths and Science". An invited presentation at the ASCA World Clinic 2009, Fort Lauderdale, Florida, September 12. [<http://coachsci.sdsu.edu/swim/bullets/ASCA2009.pdf>]
- Rushall, B. S. (2011). *Swimming pedagogy and a curriculum for stroke development* (Second edition). Spring Valley, CA: Sports Science Associates [Electronic book]. [<http://brentrushall.com/pedagog/index.htm>]
- Rushall, B. S. (2013). Commentary on the long term athlete development model for British swimming and the misinformation it propagates. *Swimming Science Bulletin*, 38, pp. 21. [<http://coachsci.sdsu.edu/swim/bullets/LTAD38.pdf>]
- Rushall, B. S. (2014a). *Swimming energy training in the 21st century: The justification for radical changes* (Second edition). *Swimming Science Bulletin*, 39, pp. 58. [<http://coachsci.sdsu.edu/swim/bullets/energy39.pdf>]
- Rushall, B. S. (2014b). Ultra-short race-pace training and traditional training compared. *Swimming Science Bulletin*, 43, pp. 8.
- Rushall, B. S. (2015). USRPT defined: After two years USRPT comes of age. *Swimming Science Bulletin*, 49, pp. 17. [<http://coachsci.sdsu.edu/swim/bullets/49DEFINED.pdf>]
- Rushall, B. S., & Ford, D. (1982). Teaching backwards - an alternative skill instruction progression. *CAHPER Journal*, 48(5), 16-20.
- Rushall, B. S., & Pyke, F. S. (1991). *Training for sports and fitness*. Melbourne, Australia: Macmillan of Australia.
- Rushall, B. S. & Siedentop, D. (1972). *The development and control of behavior in sports and physical education*. Philadelphia: Lea and Febiger.
- Rusko, H. K. (2004). Influence of increased duration or intensity on training load as evaluated by EPOC and TRIMPS. *Medicine and Science in Sports and Exercise*, 36(5), Supplement abstract 1023. [<http://coachsci.sdsu.edu/csa/vol134/rusko.htm>]
- Savage, M. V., Brown, S. L., Savage, P., & Bannister, E. W. (1981). Physiological and performance correlates of training in swimmers. Paper presented at the Annual Meeting of the Canadian Association of Sport Sciences, Halifax, October 1981. [<http://coachsci.sdsu.edu/swim/training/savage.htm>]



*bellas*TM

DOLFIN[®]
LIVE IN WATER

www.dolphinswimwear.com





WO

5 SWIM SETS YOU HAVE TRY BEFORE YOU DIE

BY WAYNE GOLDSMITH

Swim sets are like burgers. There's a lot of them in the world: some are great, some are awful and some are just plain ordinary burgers. Here are 5 Swim Sets You Have Try Before You Die

A great swim set has to include three things:

1. It must be **challenging** – and demand more of you physically, mentally, technically and tactically than previous training sets;
2. It must be able to be **progressed** – i.e. you can make the set more challenging and more demanding over time by changing variables such as speed, breathing frequency, rest periods and the number of repeats in the set;
3. It has to make you swim faster in competition – the set has to actually make a difference to your swimming performances.

Here are 5 Swim Sets which are challenging, can be progressed and most importantly – will make a big difference to your racing.

5 Swim Sets You Have Try Before You Die

1. 50 / 100 / 50 set

This set is a killer but it really sorts out the men (and women) from the mice. It is a great set for learning to sustain high-speed swimming with limited rest.

It goes like this:

- Dive and swim 50 metres on a 1:00 minute time cycle at 100 metre pace;
- Swim 100 metres with a push start on a 2:00 minute time cycle at 200 metre pace;
- Dive and swim 50 metres on a 1:00 minute time cycle at 100 metre pace.

Repeat the above 50 / 100 / 50 sequence 4 times through. Then add another 50 / 100 / 50 each week until you can complete 6-10 of them in a single swim set.

2. Mini Max Swim Set with Double Ups

Mini-Max (i.e. minimum stroke count at maximum speed) swim sets are great for developing both speed and M.D.S. – maximum distance per stroke.

Start with a single timed 50 metre maximum speed swim. Count your strokes.

Add the time and the stroke count together for a total lap “score”.

For example if you swam the 50 metres with 46 strokes and your time was 42 seconds, **that’s a total score of 88.**

Now swim another 50 at maximum speed – also counting your strokes but aiming to reduce **your score** of 88 by at least 1, i.e. by swimming faster, taking fewer strokes or both.

So – say you swam 40 seconds and took 44 strokes, your new lap score is **84.**

Next – the “**double-up**”.

Multiply your lap score of 84 by 2 and that becomes your goal score for a 100 metre swim, i.e. **168.**

Swim 100 metres at maximum speed, count your strokes and add your time and stroke count together striving to score better than **168.**

Then....yes – you guessed it. Double up again and see how you go for a 200!

And then.....yep – believe it or not – try doubling up again for a **Mini-Max 400.**



3. Magic Medley Mayhem

This swim set has been a favourite of medley coaches for a long, long time.

- 4 x 25 Medley order (i.e. that’s 25 fly, 25 back, 25 breast, 25 free) on 30 seconds
- 100 IM on 2:00 minutes
- 4 x 50 Medley order on 1:00 minute
- 200 IM on 4:00 minutes
- 4 x 100 Medley order on 2:00 minutes
- 400 IM on 8:00 minutes.
- Rest 5 minutes.
- Timed 200 IM within 5 seconds of your PR time.
- Rest 5 minutes
- Timed 400 IM within 10 seconds of your PR time.

Add this “golden-oldie” to your training program and watch your medley times plummet.

4. Horrible Hundreds

It doesn't sound like much but this swim set is another that can make or break most swimmers. It's very simple in design yet – done correctly and with total commitment – it is as tough as it gets.

8 x 100 metres on 6::00 minutes.....all at **maximum** speed and all within 3 seconds of your PR time.

If you don't swim within 3 seconds of your PR time, that 100 does not count and you have to repeat it.

Ouch!



[Photo Courtesy: Xinhua/Xan Yan]

5. Endless 50s.

This swim set is another shock to the swimming system.

Swim a single 50 metre effort at maximum speed.
Add five seconds to that time.

For example – if the maximum speed swim equals 38 seconds , then add 5 = **43 seconds**.

Now add another 5 seconds – i.e. 48 seconds.

And now the fun part.....*How many 43 second swims can you repeat on a 48 second time cycle?*

Key:

Less than 5: You're as soft as a marshmallow.

6 – 10: Good but you can do better.

11 – 15: Very good.

16 – 20: Excellent

More than 20: Move over Phelps. Look out Ledecky.... you're awesome.

Swim sets come in a virtually unlimited range of designs and variations.

While the design of the swim sets is important , it's even more important to think about how you swim them.

Even the best designed of swim sets, if executed poorly, will not help you to achieve your swimming goals or to realise your personal performance potential.

However, well designed swim sets, when completed with commitment, engagement and enthusiasm can make a considerable impact on your competitive swimming capacities. ◀

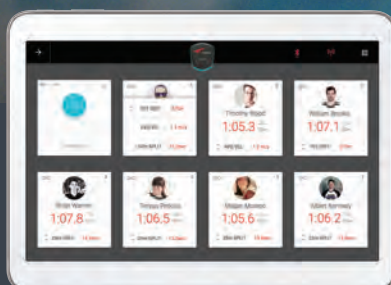
THE WORLD'S FIRST IN-WATER WEARABLE TO DELIVER REAL-TIME METRICS

CONTACT US TODAY FOR YOUR
FREE ONLINE DEMO

www.tritonwear.com/sworld



Spending too much time tracking all of your swimmers?
Let TritonWear® track and manage all key metrics
while you focus on making your swimmers faster.



THE TRITON

The Triton captures over **12 key performance metrics** from each swimmer and sends the data in real-time to the coach's tablet.

REALTIME FEEDBACK

The coach can review real-time data poolside for more than **30+ swimmers** simultaneously and make faster, more informed decisions.

LONGTERM TRACKING

Allow coaches to access and **review historical workouts** to find negative trends before they become serious problems.



BETTER COACHING SUPERIOR ATHLETES

www.tritonwear.com

AUTOMATICALLY CALCULATES OVER A DOZEN PERFORMANCE METRICS

- Split Time
- Turn Time
- Speed
- DPS
- Cadence
- Breath Count
- Distance Underwater
- Stroke Type
- Pace Time
- Total Swim/Rest Time
- Stroke Count
- Stroke Rate
- Stroke Index
- Distance
- Kicks Underwater

DIFFERENT STROKES FOR DIFFERENT FOLKS: THE BEST SWIMMING STREAMLINE

by DR. G. JOHN MULLEN

No two people are alike, nor are two swimmers. Look the NCAA championships or the various conference championships and you'll see similar body types at the pool, but no two are identical. Look around your high school conference meet and you'll see a greater variance in body type. Study the physiques of a triathlete and an Olympic pool swimmer, and I guarantee their body types are far different. Yet, coaches often prescribe the same technique suggestions for each swimmer, ignoring their anthropomorphic (body ratios), flexibility, strength, etc. If we all agree no two swimmers are alike, then why are most swimmers on the same team instructed to do the same thing? Can we expect Matt Grevers (6'8" 229 lbs) and Ryosuke Irie (5'10" 137 lbs) to use the same technique for the entire race? If we can't expect these two Olympians to use the same skills, then can we expect two people of highly different skills, sizes, and flexibility to use all the same technique?

This article is a first in a new series in which I will break down different biomechanics in the pool and discuss which methods may be best for each individual, as individuality is paramount.

WHAT IS YOUR SWIMMING STREAMLINE CAMP?

I've heard countless coaches suggest improving swimming streamline is the easiest route for swimming improvement, and I couldn't agree more. Often adjusting your swimming streamline takes very little extra energy (other than the energy required to learn a new skill), yet you swim faster. What a good deal! Streamline is a position that creates the least amount of resistance. When you're stationary, a straight line is this position, but obviously a streamline position for different body types results in varying swimming streamline positioning. Overall, there are two camps for streamline:

1. **Biceps Over Ears:** This position is believed to minimize water between the body and is performed by the swimmer squeezing their arms (particularly their biceps) against their ears.
2. **Elbows Behind Head:** This position attempts to maximally streamline the arms and reduce drag in front and



on the side, as the swimmer squeezes their arms together, behind their head.

These two options don't sound vastly different from one another, but talk to any true swim nerd and you'll certainly get a full-winded opinion on their opinion. Perhaps both camps are correct...

A TALE OF TWO SWIMMERS

As an example, let's look at two common swimmers, Tight Tommy and Flexible Frank.

1. Tommy is a Masters swimmer in his 30s. Tommy was an NCAA qualifier in college and is now a computer programmer and sits 60 hours a week at a desk. He has the typical "swimmer's posture" with rounded shoulders and a curved back.
2. Flexible Frank is a high school swimmer. Frank started swimming when he was 4-years-old and although he was never diagnosed with hypermobility, he can touch his forearms on the ground. Frank also has hyperextended elbows and knees and admits his shoulders often feel "unstable".

These two swimmers sound very different, but with every team I consult, whether it is a Masters, college, or club team, I see a lot of Tight Tommys and Flexible Franks.

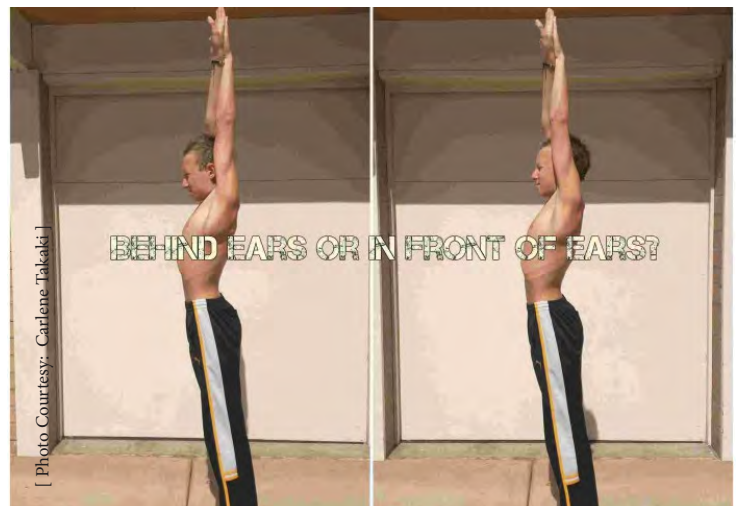
WHICH SWIMMING STREAMLINE IS BEST FOR TOMMY AND FRANK?

If a swimmer is extremely flexible, they likely — not always, but likely — arch their back during their swimming streamline and aren't capable of stabilizing their upper torso/arms. This altered position disrupts streamline, while adding extra stress on the lumbar spine. Frank likely streamlines like this. Therefore, a swimming streamline position with the elbows against the ears is likely more suited for him.

For Frank, if he streamlined at his ears, he'd likely remain hunched in his swimmer's posture and face tremendous water resistance in the water. Therefore, Frank should have his arms behind his ears, bringing him out of spinal flexion and into a streamlined position.

DOES THIS WORK FOR EVERYONE?

Clearly, this simplistic example won't work for everyone. Some Tommys are able to maximally streamline with their elbows behind their head, while some Franks are able to move out of flexion during streamline. Nonetheless, having two different options for a swimmer can help all of your swimmers. Remember, have a reason behind every biomechanical adjustment to each swimmer! Just because an Olympian streamlines with their elbows behind their head doesn't mean it is best for you!



WRITING TO LEARN IN SWIMMING

An Introduction to Athletic Team Notebooks & Journals

by Richard Kent, Ph.D.

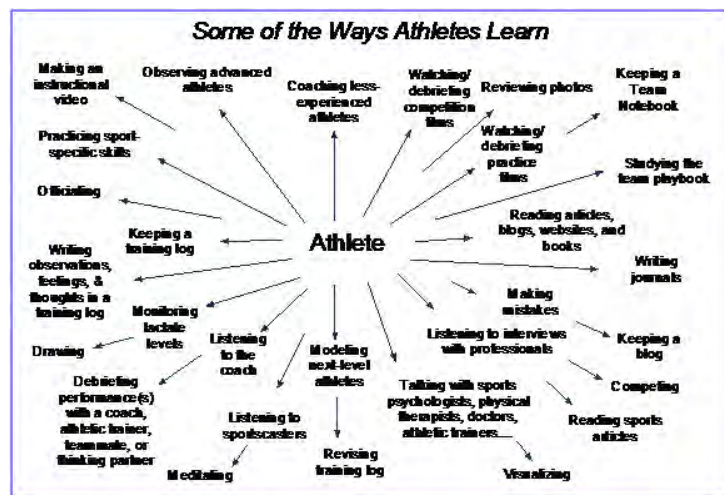
Swimmers learn at different rates and in different ways just like baseball players, heart surgeons, and dancers. Learning theorists have long promoted the idea of diverse learning styles. But how do learning differences affect coaching, athletes, and performances?

Some coaches tend to rely on “talk” as a way to instruct their athletes. Of course, this method demands that athletes listen. Some swimmers listen well; they hear a coach’s words and translate the message into improved performances. Others don’t learn as well by listening; they connect the dots of understanding through a variety of activities like coaching younger athletes, watching video, or keeping a notebook. To be sure, there are as many ways to learn as there are individual athletes.

Once, to help my cross-country ski racers learn a new technique, I came up with a little song for them to sing as they practiced the V-1 skating technique. The rhythm of the song helped them master the technique. What we’ve learned about learning over the years is that athletes benefit from a variety of coaching methods and learning activities (Kent, 2012). Figure 1 offers a glimpse at some of the activities coaches devise to help athletes learn.

One powerful and often neglected way for swimmers to learn is through writing. For decades, sport psychologists have used writing activities with athletes as a way to enhance training and performance. Why is writing such a powerful way to learn? Pulitzer Prize-winning author and teacher Donald Murray suggests an answer: “We write not to say what we know, but to learn, to discover, to know. Writing is thinking, exploring, finding out” (1987).

Sport psychologists Leif H. Smith and Todd M. Kays agree. Writing is a “type of daily ‘mental muscle’ work [that] will gradually improve your focus in practice and games” (2010). And Dr. Stephanie Dowrick (2009) explains that writing and journaling can reduce stress and anxiety, increase self-awareness, sharpen mental skills, and strengthen coping abilities.



Over the past ten years I have studied athletes’ writing in the form of Athletic Team Notebooks and Journals. In *Writing on the Bus: Using Athletic Team Notebooks and Journals to Advance Learning and Performance in Sports*, I answer the question “why write?” this way:

“Having athletes take a few minutes to write in an Athletic Team Notebook or Journal enhances communication and amplifies learning. As learning tools, notebooks and journals serve as a place for athletes to analyze and reflect. They engage seniors and first-year students, all-stars and benchwarmers—in different ways. And that difference is the beauty of such a learning activity” (2015).

The prompts in a Team Notebook help create opportunities for athletes to set goals and work through challenges while providing space for reflection and performance analysis. The basic Team Notebook consists of six sections (three sections have been linked to the Swim Team Notebook Resource Website):

- *Preseason Thoughts: the prompts in this section help swimmers think about the previous season while planning for the next.*
- *Race Analysis I: these prompts guide swimmers in analyzing their races.*
Race Analysis II: the prompts help swimmers analyze a race they watch in person or on video.
- *Postseason Thoughts: this section helps swimmers think about the season and the upcoming offseason.*
- *Athletes’ Journals: these prompts ask swimmers to write about a variety of situations, thoughts, and ideas both in and out of the pool.*
- *Athletes’ Notes: this section provides swimmers with a place to keep notes from the coach or developed by the swimmer.*

Athletes’ Journals have the potential to help athletes look

inward as a way to make sense of their lives as athletes. Such prompts provide swimmers with an opportunity to look back and think forward as they identify strengths, challenges, and missed opportunities. Journal prompts give athletes a place to set goals, reflect, grapple with issues, keep track of training ideas, note-taking, and record results.

Page through an athlete's journal and there's evidence of how swimmers plan, scheme, and ponder as well as rant, question, and celebrate. Athletes respond to prompts such as the following:

- What makes training hard for you?
- Create your timeline as a swimmer.
- List up to five qualities of an effective coach.
- Who brings out your best and why?
- Make a list of the top ten things you admire about yourself as a swimmer and person. Write about one of these attributes.

For a coach, reading an athlete's writing can open doors to communication and insight into an athlete's needs. "Writing provides another avenue for strengthening the player-coach relationship," says coach Brian Bold of Burnt Hills-Ballston Lake (N.Y.) High School.

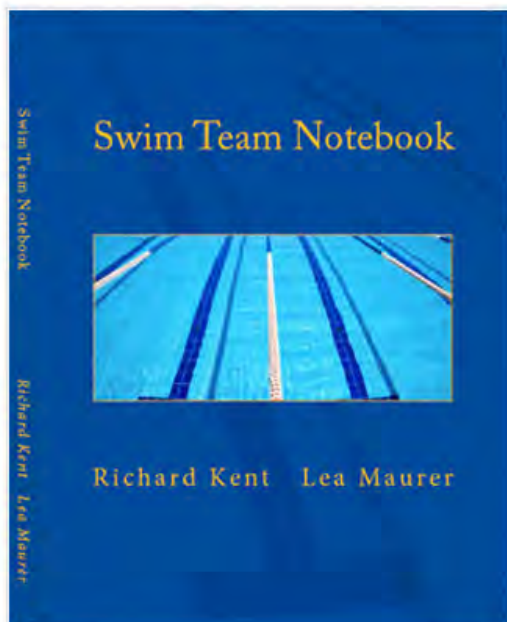
An NCAA All-American and PAC-10 champion in diving at Stanford University, Meg Hostage found that writing as a high school athlete kept her focused. "Writing worked to keep me accountable for what I wanted to achieve, and in a way helped me to reach my goals," she says. "Putting it all in writing reminded me what I was working toward every time I opened the journal to make a new entry" (2012, p. 106).

In terms of learning, communication, and athlete development, writing can make an important difference for a swimmer. Taking 3-5 minutes each day to reflect on a race, training, or underwater kicking can help swimmers take charge of their learning and swim faster. ◀

ABOUT THE AUTHOR

Richard Kent, PhD, is a professor at the University of Maine and the author of 14 books, including the Swim Team Notebook with Lea Maurer, former Stanford University swim team coach and Olympic Gold Medalist. Kent maintains Writing Athletes, a resource website.

swimteamnotebook.com



The Swim Team Notebook... a workbook for every swimmer on your team. Based on the training logs, notebooks, and journals of Olympians and other world-class athletes, the *Swim Team Notebook* provides a wide variety of reflective writing activities that can optimize the performance of a team by helping its athletes become "students of the game." The notebook includes a season's worth of reflections, race analyses, journal prompts, injury rehabilitation forms, team-building activities, note pages, and more.

Praise for The Swim Team Notebook...

"A key to my development during college was building confidence that I could be an Olympian and record-setting swimmer. Lea Maurer helped me build that confidence by providing positive reinforcement that the things I was doing in training and in my races was building towards amazing outcomes at the end of the season. I think that this notebook can help you build that confidence in yourself and there is no substitute for confidence in athletics."

—Julia Smit, 2x-time Olympic Medalist

"Lea Maurer made swimming fun for me and she really taught me how to learn from my training and my races. This notebook can help you learn the thought process that has helped me be the swimmer that I am and be a reminder that fun is part of the process." —Matt Grevers, 6x-time Olympic Medalist

THE TRUTH ABOUT ICING... WHAT WE STILL DON'T KNOW!

by DR. G. JOHN MULLEN



Icing has been under scrutiny over the past few years and I'm a tad late on the whole icing debate. Excellent and inquisitive posts have already accrued, so why am I finally coming to the discussion?

Although previous articles were well-researched and in-depth, I feel they missed a few key points [[Mobility WOD; 10 Reasons – Icing Injuries is Wrong](#)]. This isn't a knock at my online peers, but implies the complexity of this seemingly simple topic. It also suggests the unknown, something clients and patients hate to hear and something health care professionals, trainers, and voodoo doctors hate even more to admit. Nonetheless, icing is a tough topic which is poorly understood and something I'm adding to the [COR Swimmer's Shoulder System](#).

THE VARIOUS REASONS FOR ICING

Icing for athletes is poorly researched and misinterpreted because because the reasons why people use ice varies greatly. Do you have acute pain for training? Do you have acute pain from an injury? Do you have chronic pain from an injury? Do you have acute pain from training and a competition? Do you have an acute injury, but want to continue to train? These are only some of the factors I deal with in my physical therapy and personal training practice.

I have patients of all shapes, skills, and goals. If I suggest icing, it depends on these factors. Unfortunately, the research doesn't account for all these factors, as it is hard to control for different factors. Also, the research doesn't accurately understand the inflammatory process of a human after an acute injury. Think about it: Who would sign up for a study where you sprain your ankle and track the inflammatory response? I know none of my elite dryland swimmers are interested, and even my sedentary physical therapy patients wouldn't be interested. Therefore, we group acute inflammation from an injury and acute inflammation from training into one box. Unfortunately, these boxes should be different, as inflammation from training (which causes soreness from breaking down the z-disks during cross-bridging) is likely more acute than inflammation from an acute injury.

Once again, grouping everything together and saying icing is wrong is likely an overstatement. Based on the current unknowns from research and highly variable goal and phase of the inflammation, we

clearly don't have all the answers. On top of this, I haven't even mentioned individual genetic inflammatory response. This is a tad out there, but genetically there are different inflammatory responses in the cardiovascular system, so why not in the muscular system? This is an area I wish I knew more about, but is it too much to imagine that some people have different inflammatory responses to injury and training than others? Also, people could have a different response to ice than other. Although the research suggests ice does not improve inflammation for the majority, are we confident it doesn't help some people? On top of this, ice does have a nociceptive effect (pain-reducing) which can help function, and isn't this really the goal? If you have pain during movement or pain all the time, removing that is the goal. Once that is resolved, you can get precise and look at reducing your inflammation with diet and lifestyle. Too often we medical professionals express the importance of a cellular function, though improving general movement and quality of life is much more important.

Who cares about inflammation if you can't walk!

With all this ranting, you'd probably think I give all my patients ice packs as they walk in the door, but I don't even have ice at my physical therapy clinic. Why waste someone's time with something they can do on their own? If I don't hand out ice, you think I must recommend it to a lot of swimming physical therapists or swimming personal training clients. Once again, a big stinking nope.

I recommend ice in a few scenarios:

- *Have high pain and need some relief? Try some ice. It won't cure the pain, but it can help for about 60 minutes. This window could help you move better, preventing other musculoskeletal injuries and compensations.*
- *Have an important practice or competition and need relief? Try some ice. It may limit inflammation and muscular strength and gains, but oh well, you're not looking for a training response, but performance.*

Once again, this is a dense topic and will involve much more study. ◀

LOOKS FAST. FEELS FAST. IS FAST.

COBRA **ULTRA**

AVAILABLE NOW AT ALL AMERICAN,
SWIM OUTLET AND
ARENAWATERINSTINCT.COM



EXTRA WIDE
VISION



HARD
LENSES



MIRRORED
LENSES



INTERCHANGEABLE
NOSE BRIDGE



HYDRODYNAMIC
DESIGN



FORWARD
VISION



DUAL
STRAP



ALL AMERICAN SWIM™

SWIMOUTLET
.com

ARENAWATERINSTINCT.COM/COBRAULTRA

SPONSORED BY



2015 AQUATIC DIRECTORY

The listings on the following pages are paid advertisements.

2015 AQUATIC DIRECTORY

AWARDS AND AWARD DISPLAY

Hasty Awards

800-448-7714.....www.hastyawards.com
Hasty Awards is a family-owned company that has 29 years of success in providing organizations and businesses their every award need. From ribbons, medals, trophies and plaques to crystal, glass, full color acrylics and promotional items, Hasty Awards provides unlimited opportunities for organizations to recognize and reward those who excel. Our creative designs, excellent products and competitive prices have positioned us to be a leader throughout the awards industry as well as being recognized for our high quality and excellent service. Our central location and timely deliveries ensure our products arrive within the time frame they are requested.

Maxwell Medals & Awards

800-331-1383.....www.maxmedals.com

SwimOutlet.com

800-691-4065.....www.swimoutlet.com

BOOKS, DVDs, MAGAZINES, TAPES

Global Aquatics

646-528-6238.....www.Drjanekatz.com
Dr. Jane Katz is a World Masters Champion swimmer, aquatic fitness pioneer, member of the International Marathon Swimming Hall of Fame and recipient of the FINA IOC Certificate of Merit in 2000 for 45 years of contributions to the sport. Jane shares her expertise and joy of swimming in several easy-to-follow instructional DVDs and books. They are ideal for anyone -- of any age -- wanting to know more about swimming techniques, safety, fitness and health education and include Swimming for Total Fitness, Your Water Workout, Swim Basics, Tri Synchro, The New W.E.T. Workout® and more. For more information: www.globalaquatics.com

Swimming World Magazine

800-511-3029.....www.SwimmingWorld.com

CAPS

Agon Sport LLC

877-718-9403.....www.agonswim.com

Dolfin Swimwear

800-441-0818.....www.dolfinswimwear.com
Dolfin has been one of the leading swimwear brands for more than 70 years. It is recognized for offering the best value in the industry with the highest standards of innovation and quality. Founded and operated in Pennsylvania, Dolfin continues to provide its customers with the best quality swimwear at the most competitive prices in the industry. From product development and design to presentation and delivery, Dolfin is committed to customer satisfaction and to our goal of becoming America's most popular brand of performance swimwear. For more information on Dolfin, please visit <http://www.dolfinswimwear.com>

Hasty Awards

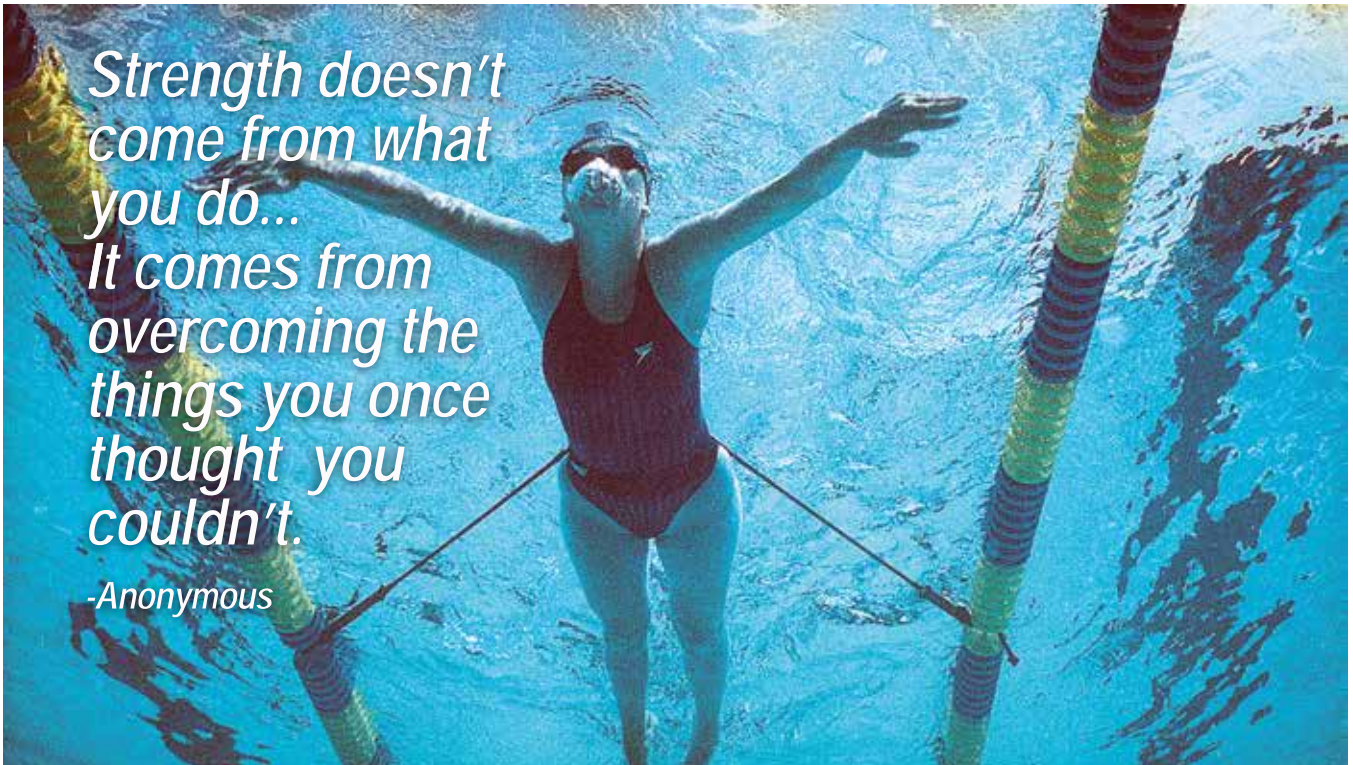
800-448-7714.....www.hastyawards.com

DRYLAND TRAINING EQUIPMENT

Strechcordz® by NZ Mfg.

800-886-6621.....www.nzmfmg.com

— continued on 4



Strength doesn't
come from what
you do...
It comes from
overcoming the
things you once
thought you
couldn't.

-Anonymous

 **STRECHCORDZ**
Gear for stretching, exercising and training.

www.nzcordz.com

1-800-866-6621



STAND OUT

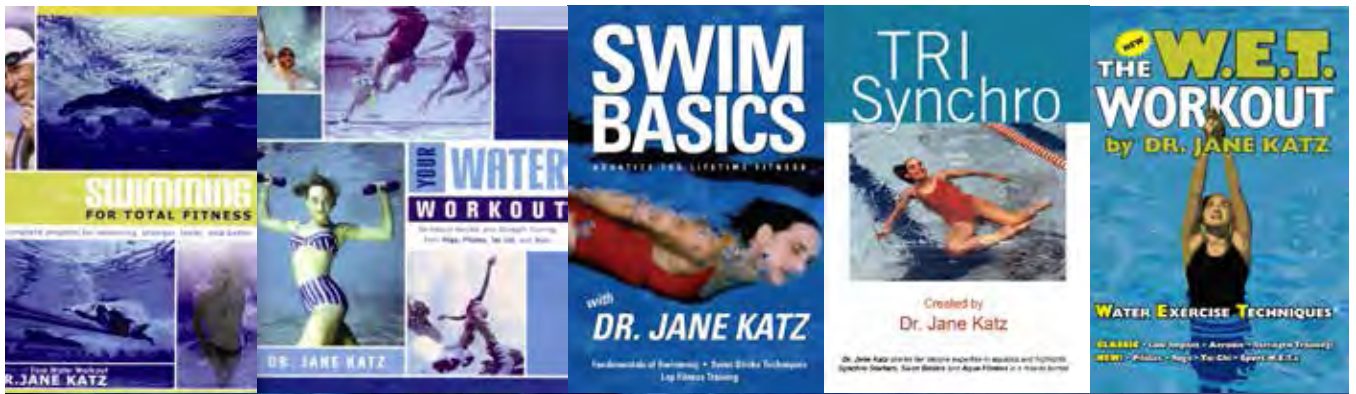
THE LIMITED EDITION POWERSKIN ST. AVAILABLE
NOW AT ARENAWATERINSTINCT.COM



ELITE LEVEL RACING AT AN ENTRY LEVEL PRICE -
\$130 WOMEN / \$100 MEN

ARENAWATERINSTINCT.COM
@ARENAUSA





Dr. Jane Katz is a World Master's Champion swimmer, aquatic fitness pioneer, member of the International Marathon Swimming Hall of Fame and recipient of the FINA IOC Certificate of Merit in 2000 for 45 years of contributions to the sport. Jane shares her expertise and joy of swimming in several easy-to-follow instructional DVDs and books. They are ideal for anyone – of any age – wanting to know more about swimming techniques, safety, fitness and health education and include *Swimming for Total Fitness*, *Your Water Workout*, *Swim Basics*, *Tri Synchro*, *The New W.E.T. Workout*® and more. For more information: www.globalaquatics.com



— continued from 2

NZ Manufacturing, Inc., a leader in high-quality resistance swim training, general sports training and physical rehabilitation tools, celebrates its thirtieth year providing innovative exercise products to coaches, athletes, physical therapists, chiropractors and patients. NZ Manufacturing was founded in 1985 with the development of StrechCordz®, an engineered line of high-quality swim training products. Originally designed by a small group of competitive swimmers, StrechCordz Dryland and In-Water tools help improve stroke, endurance and strength through resistance. Today, StrechCordz is recognized as the top swim training product line worldwide, used by swimmers ranging from novice to International Olympians. Use Promo Code 'DISC10' on your next online purchase at www.nzcordz.com

SwimOutlet.com

800-691-4065.....www.swimoutlet.com

EMBLEMS, TEAM PINS

Hasty Awards

800-448-7714.....www.hastyawards.com

Maxwell Medals & Awards

800-331-1383.....www.maxmedals.com

FINS, MONOFINS

Finis

888-333-4647.....www.finisinc.com

John Mix and Olympic Gold Medal swimmer Pablo Morales founded FINIS in 1993 in Northern California. Since that time, technical development and design has remained the highest priority at FINIS. This dedication has resulted in unique products like the Swimmer's Snorkel, which is recognized as the paramount tool to improve a swimmer's technique; the Neptune MP3, which uses bone conduction technology to transmit music to the inner ear instead; and the Z2 Zoomers fins, which demonstrate an intimate understanding of swimming musculature, hydrodynamics and engineering. Today, FINIS continues to simplify swimming through technical innovation, high-quality products and a commitment to education.

Speedo USA.....www.speedousa.com

GOGGLES, GOGGLE DEFOGGER

Dolfin Swimwear

800-441-0818.....www.dolfinswimwear.com

Finis

888-333-4647.....www.finisinc.com

Speedo USA.....www.speedousa.com

SwimOutlet.com

800-691-4065.....www.swimoutlet.com

HAIR AND SKIN PRODUCTS

S.R. Smith

800-824-4387.....www.srsmith.com

KICKBOARDS

Finis

888-333-4647.....www.finisinc.com

Speedo USA.....www.speedousa.com

LANE LINES AND REELS

Antiwave Pool Products

866-736-2183.....www.antiwave.com

Competitor Swim

800-888-7946.....www.competitorswim.com

Competitor® Racing Lanes provide superior wave-quelling performance proven to outperform other leading products by 20 percent. Made in the USA for more than 40 years, and fully guaranteed for durability and performance, Competitor is the Official Lane Line of USA Swimming and the NCAA Championships. Competitor Racing Lanes employ a unique flow-through system that provides consistent wave quelling from one lane to another. Competitor swim lanes also feature Lifespan+™ a new, proprietary protective formula that provides cutting-edge

— continued on 6

Introducing

LifeSpan+™

The Longest Lasting Lane Line with the Science to Prove it.

This new formula, which goes into the production of each lane line, delivers a superior product that substantially increases the useful life of Competitor® discs in harsh pool environments.

Download the Oxidation Testing Report at:
www.competitorswim.com/lifespan



© 2015 Competitor Swim Products

WATER IS THE MOST POWERFUL FORCE ON EARTH.
WE RESPECT WATER AS AN OPPONENT,
BUT WE WILL NEVER BEND TO ITS WILL.

INTRODUCING

TiTANIUM™

CREATED & DESIGNED BY

DOLFIN
SWIMWEAR

— continued from 4

polymer- and color-stabilization components to substantially increase product life in harsh pool environments. Competitor Swim offers a complete line of swim products, including Storage Reels, Pace Clocks, Backstroke Flags, and the Original Swedish goggles.

S.R. Smith

800-824-4387 www.srsmith.com

LIFEGUARD AND JR. LIFEGUARD TRAINING

S.R. Smith

800-824-4387 www.srsmith.com
S.R. Smith manufactures high-quality products for commercial aquatic facilities and residential swimming pools. Products include starting blocks, lifeguard chairs, lane line reels, pool sport games, water features, ADA compliant pool lifts, ladders & rails, diving boards, slides and pool lighting. And for people who design and build aquatic facilities, we have created configuration tools to make it easier to select the S.R. Smith products needed. Through a network of distributor partners, we offer products for new construction, remodel and the aquatic service industries. For more information visit www.srsmith.com or email info@srsmith.com

Strechcordz® by NZ Mfg.

800-886-6621 www.nzmfg.com

PADDLES

Dolfin Swimwear

800-441-0818 www.dolfinswimwear.com

Finis

888-333-4647 www.finisinc.com

SwimOutlet.com

800-691-4065 www.swimoutlet.com

PREP SCHOOLS

Baylor School Chattanooga, TN

Co-ed Boarding & Day, Grades 6-12

423-267-8506, ext. 279

Dan_flack@baylorschool.org

www.baylorschool.org

Fork Union Military Academy..Fork Union, VA

Boys Boarding, Grades 6-12

434-842-4205 800-GO2-FUMA

www.forkunion.com

Gulliver SchoolsPinecrest, FL

Co-ed Day, Grades Pre K3-12

305-666-7937 poppi@gulliverschools.org

www.gulliverschools.org

Mercersburg AcademyMercersburg, PA

Co-ed Boarding & Day, Grades 9-12

717-328-6173 Admission@mercersburg.edu

www.mercersburg.edu

Peddie SchoolHightstown, NJ

Co-ed Boarding & Day, Grades 9-12

609-944-7501 Admission@peddie.org

www.peddie.org

Saint Andrew's School.....Boca Raton, FL

Co-ed Boarding & Day, Grades K-12

561-210-2020 Admission@saintandrews.net

www.saintandrews.net

Suffield AcademySuffield, CT

Co-ed Boarding & Day, Grades 9-12 and PG

860-668-7315 ALowe@suffieldacademy.org

www.suffieldacademy.org

SNORKELS

Finis

888-333-4647 www.finisinc.com

SPEED ASSIST EQUIPMENT

Strechcordz® by NZ Mfg.

800-886-6621 www.nzmfg.com

STARTING BLOCKS

Antiwave Pool Products

866-736-2183 www.antiwave.com

S.R. Smith

800-824-4387 www.srsmith.com

— continued on 8

ANTIWAVE POOL PRODUCTS



Competitive Lane Lines
Water Polo Fields & Goals
Storage Storeels
Supertensioners
Starting Blocks

"Simply The Best"

- > Three year warranty on all products
- > Three sizes of Lane Lines - 3, 4.75 & 6 inch
- > Five styles of Water Polo Goals
- > Fast shipping time & low shipping cost

For more information contact us at:

antiwaveinfo@antiwave.com

p. 866.736.2183

f. 940.458.4943

www.antiwave.com

"We have worked with leading coaches to develop the perfect end-to-end elite performance system for swimming"

- Ryan Bennett, SwimPro Founder

WORLD'S LEADING SWIMMING VIDEO ANALYSIS TECHNOLOGY INCORPORATING:

- ✓ Purpose built preprogrammed HD wireless cameras
- ✓ Custom above and below water mounts
- ✓ Powerful and portable IQ2 Enterprise software
- ✓ Real-time, delayed streaming to pool-deck displays and iPads
- ✓ Extensive multi-view and frame-by-frame analyses
- ✓ CommentaryCAM for simple poolside and post analysis coaching
- ✓ SwimmingCloud for Internet storage, post analysis, collaboration and sharing
- ✓ 12 month full replacement warranty
- ✓ Online and telephone support



"SwimPro has helped revolutionise how we work with swimmers. To be able to capture real-time footage from multiple angles, add delays, analyse, diagnose and then be able to communicate to a swimmer at the pool deck helps improve the quality and effectiveness of our coaching. Thus speeding up the improvement in the swimmers technique and performance."

Jim Fowlie, elite Olympic coach, has joined SwimPro as our Director of Coaching

Enquire today at info@swimmingcam.com

www.swimmingcam.com

FREE SHIPPING thru June '15
Checkout code
SWFS

— continued from 6

SWIMWEAR

Agon Sport LLC

877-718-9403..... www.agonswim.com

Dolfin Swimwear

800-441-0818..... www.dolfinswimwear.com

Finis

888-333-4647..... www.finisinc.com

Speedo USA

..... www.speedousa.com

SwimOutlet.com

800-691-4065..... www.swimoutlet.com

Swimsuitsforall

888-241-7946..... www.swimsuitsforall.com

At Swimsuitsforall, we're making the world a better place to swim in, one perfectly fitting, amazingly flattering suit at a time. Since 2005, our unique perspective on female beauty has made us a leader in swimwear for curvy women. Aquabelle, our chlorine resistant swimwear line, is designed to keep the original color and shape so you can throw your worries - and old, beat-up suits - to the wind. Soak up the sun in these long-lasting suits with tummy control! Everything we do comes

down to one simple principle: to make shopping for a swimsuit just as enjoyable as wearing one.

SWIM CLINICS AND CAMPS

Fitter and Faster Swim Tour

www.fitterandfaster.com

The Fitter and Faster Swim Tour *Presented by SwimOutlet.com* is the only turn-key elite level swim and **water polo** clinic operation in the United States. FFT handles all the work from the day they agree to produce a clinic or camp with "local hosts" until the event concludes. Over the past two years Fitter and Faster produced more than 250 clinics and camps in 44 states. FFT selects where to produce clinics based on the shared objectives and relationships with teams, LSCs, and leagues. Fitter and Faster Invests in every event that they produce and does their best to keep the financial investment on the part of the Event Host to a minimum.

T-SHIRTS (CUSTOM)

Hasty Awards

800-448-7714..... www.hastyawards.com

TEAM GEAR

Agon Sport LLC

877-718-9403..... www.agonswim.com

Dolfin Swimwear

800-441-0818..... www.dolfinswimwear.com

TIMING EQUIPMENT, PACE CLOCK

Competitor Swim

800-888-7946..... www.competitorswim.com

UNDERWATER VIDEO EQUIPMENT

SwimPro..... www.swimmingcam.com

SwimPro, The Elite Swimming Performance System; Providing Professional Coaches and Elite Athletes with the World's Leading Swimming Video Analysis Technology. Developed in conjunction with professional coaches and elite athletes, the SwimPro system of high-definition cameras with individual mounting solutions, iQ2 enterprise analysis software and hardware, iPad multi-streaming application and cloud-based storage system provides the ultimate in professional swimming coaching technology. SwimPro allows coaches to provide active feedback on pool deck as well as review and create post-analysis sessions with commentary and annotation. SwimPro is utilized on a daily basis by over 2,000 world-leading coaches, institutions and elite athletes. ❖

GET THE ROCK SOLID ADVANTAGE

For no wobble, no worry starts ask for S.R.Smith's Legacy Launch Blocks. Each starting platform is secured to the deck with a patented RockSolid™ anchor system. For more details, check out srsmith.com.

LEGACY LAUNCH SERIES



SR Smith

SERIOUS EQUIPMENT

srsmith.com • 800.824.4387 • info@srsmith.com

YouTube



**FREE
STOCK
NECK
RIBBON**



**CALL FOR
QUOTES ON
CUSTOM
MEDALS**



AS LOW AS
\$139
M-B610UC
3"



**8 COLORS
AVAILABLE!**

AS LOW AS
\$139
M-1201WC
3"



AS LOW AS
\$325
VAR-ICEU
6"



AS LOW AS
99¢
M-787W
3"



AS LOW AS
79¢
M-790W
2"



AS LOW AS
\$395
B-33VAWBM
7"



AS LOW AS
\$395
RESIN-ASW
6"



AS LOW AS
\$595
RESIN-BHW
6"



ANY QTY
\$1595
RESIN-SKY10
10"



GET IN THE FUNNEST SPORT THERE IS.

Health, fun, family, friends. Swimming brings it all together. Find a club, join a team and jump in.

FIND A SWIM TEAM

