

SWIMMING TECHNIQUE

A swimmer in a yellow cap and goggles is captured mid-splash in a pool. The swimmer's arms are raised, and water is splashing around their head and chest. The background shows a poolside area with blue umbrellas and buildings under a clear blue sky.

FEBRUARY 2016 • VOLUME 43 • NO 1 • \$3.95

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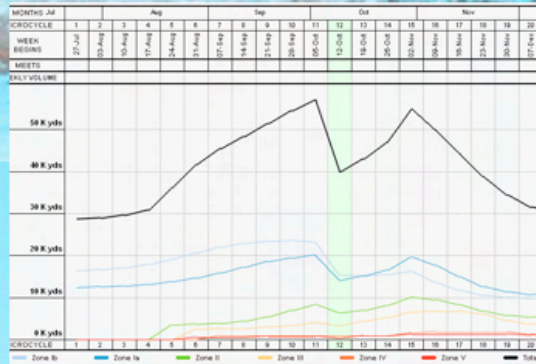
**CHALLENGING
DISTANCE SETS**



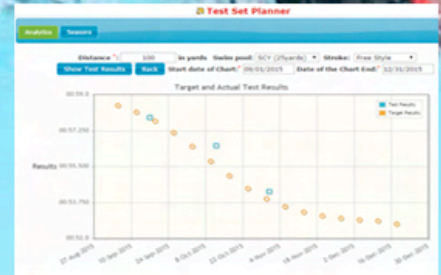
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OF SCOTTSDALE AQUATIC CLUB
BY TAYLOR BRIEN

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THE IMPORTANCE OF SCIENCE IN OUR SPORT

BY BRENT RUTEMILLER

“To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science.” — Albert Einstein

Swim coaches and scientists have always made an odd couple over the years. It has been a hot-and-cold love relationship.

The first swimming book I ever read was “The Science of Swimming” by James E. Counsilman, published in 1968. It is still on my bookshelf surrounded by all my history and science books. The pages spoke of application and theory.

Also on my bookshelf is “Swimming Faster” by Ernie Maglischo. I did not read it; I studied it until the covers came off. Tape now holds it together. The list does not stop there.

Among my collection are books written by Cecil Colwin, Tudor Bomba, Wilmore and Costill, Dick Hannula, Dave Salo, Keith Bell and many more leaders within our sport. Inside every book are my doodles and underlines.

Through the years, I have noticed when science led the sport and other years when science took a back seat. In some cases, science was left just sitting on the curb.

The breakup argument was always the same: science should not be telling coaches what to do.

In the 1960s and '70s, science and coaching worked hand in hand. Then in the '80s, science took the lead with lactate analyzing, flume studies and ICAR reports that often told coaches how to coach. Many coaches dismissed science in the '90s, and they went their separate ways.

The 2000s saw the advent of videotape analysis. It was about that time that coaches started to look for answers again. Then in the first half of the 2010s, we saw swimmers, coaches, videographers and scientists all sitting at the same table. Now in the second half of this decade, I'm seeing a need for all forces to come back together.

With that in mind, we brought back Swimming Technique Magazine with a focus on science. I am proud to have three branches of science on our editorial board. **Dr. Rod Havriluk**, internationally recognized expert on swimming technique, will bring our readers his views on technique. **Dr. Sergei Beliaev**, leading world expert on training methods and strategies, will talk about training. **Dr. John Heil**, expert on sport and performance psychology, will write about the psychological aspects of our sport.

Together they will not tell coaches what to do, but will tell coaches what coaches are doing right. Our articles will study what is being applied and explain the science behind those applications. Along the way, we hope to suggest ways to improve.

I hope you enjoy this journey we are taking and that swimming will improve on all levels with each new issue of *Swimming Technique Magazine*.



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ACCOUNTING OFFICE

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SWIM SPORT PSYCHOLOGY



**MENTAL
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Dr. John Heil & Chip Magdelinskas



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»» JASMINE TOSKY

[PHOTO COURTESY OF PETER H. BICK]

DAYDREAM BELIEVERS

BY MICHAEL J. STOTT

Successful coaches concur that fast swimming in practice and meets is about creating a mindset, culture and environment where it can happen. Then it is a matter of setting standards, expectations and holding athletes accountable. Below four coaches share their approaches that have produced world, NCAA and high school national champions.



»» TONY BATIS

[PHOTO COURTESY OF KRISTIN KARVOSKA]

TONY BATIS, HEAD COACH, PALO ALTO STANFORD AQUATICS. TRAINED JASMINE TOSKY, WHO WAS SWIMMING WORLD CO-HIGH SCHOOL SWIMMER OF THE YEAR, 5X ALL-AMERICAN AT USC, FORMER NATIONAL TEAM MEMBER

“Swimming fast in practice is as much philosophy as it is x’s and o’s. We talk all year about swimming fast in practice and meets. If you are doing a set of 10 x 100’s free on 1:00 or on 2:00 best average, the expectation is to swim

fast; the difference is what you are able to hold given the rest you’ve got. The same is true in kick, pulling and, in some cases, drill sets.

“To me, you do not race slow, so why practice slow. The counter is to have slow, precise movements to help create muscle memory (i.e. The Talent Code), but movements at speed, done correctly, can have the same tangible results. A challenge is being willing to do what is necessary to get the desired results. The following set deals with kick and stroke counts.

12 x 50’s at goal 200 pace hitting minimum kick count (usually getting swimmer to 12-14 yards) and stroke count.

4 @ :50, 4 @ 1:00, 4 @ 1:10

“Swimmers can only move to the next group of four once they have made four both on time and kick/stroke count. You can’t move on if you haven’t hit both. You have to be willing to start over or find another way to prep the athlete, but stick to the goal of completing the 12 x 50’s. I do this with 30-40 swimmers in four-to-five lanes SCY and we still manage to get it done.

“At PASA we are constantly looking at ways for swimmers to perform under duress. One way is doing all out dive sprints and underwater kicks followed by a timed dive swim. The challenge is definitely physical, but can be a mental test of character to see if athletes can raise performance to new heights. We also do structured test sets in a training cycle leading up to a max test just prior to a high performance meet. The key is motivating swimmers to perform like it is the championship meet itself.”

ALLISON BEEBE, ASSISTANT COACH SANTA CLARA SWIM CLUB. TRAINED 100 FREE AMERICAN RECORD HOLDER SIMONE MANUEL WHEN AT FIRST COLONY SWIM TEAM

“In order to race fast, you have to train fast. I am not a USRPT coach, but I am also not a ‘garbage yardage’ one either. We get in a good amount of aerobic work, but also plenty of quality and race specific work as well.



“The most important factor in getting high intensity in practice is the environment. Swimmers know I won't waste their time. Everything we do has a purpose and the expectation that we are going to be efficient is understood. Communication and education are also critical. I try really hard to communicate why we do what we do and I try to educate the swimmers on how each relates to their performing well at season's end.”

Beebe polled some former swimmers and got the following responses regarding her practices.

Sarah Shimomura, currently a freshman at Arizona placed third in the 400 free at Summer Juniors.

“You inspired me to swim fast in practice by reminding me of the big picture, that I was capable and that I could do it. When not having a good set, you said I would be expected to do these things at Arizona. You made me believe in myself, that I could go fast times during practice even when I did not think so.”

Eric Ress, University of Indiana All-American trained with the SCSC sprint/mid distance group this summer and liked her practice environment.

“As opposed to screaming or getting upset you presented the practice in a very straight forward manner and detailed what needed to be fast and what didn't. You do a great job at letting your athletes know when they need to swim a certain way; whether that be at race pace, medium effort, recovery, etc. What I liked best was the application towards specificity for a given race/event.”

Swimmers from First Colony Days (she coached all Senior Elite athletes- sprint through distance)

Simone Manuel, AR holder in the 100 free, redshirt sophomore at Stanford

“When you train fast, it builds confidence. You can gauge your improvement and you have a better understanding of how you might swim in a meet.”

Madison Varisco, sophomore at Golden West and CCCAA Swimmer of the Year

“You were completely honest with us, laying it all out and creating an environment where failure wasn't an option. You had us make goals for meets, practices and specific sets. You were relatable on many different levels and your interest and honesty regarding our lives made us respect and trust you.”

CHRIS PLUMB, HEAD COACH CARMEL SWIM CLUB AND CARMEL HIGH SCHOOL. PLUMB'S GIRLS HAVE WON FOUR OF THE LAST FIVE SWIMMING WORLD MAGAZINE NATIONAL CHAMPIONSHIPS.

It is a mentality and about the standards you set he says. “If you believe you can swim fast in season and that's what you train to do, then you can. You have to balance it out, but fast swimming is fast swimming. You have to make that demand of athletes in practice. When doing a 20 x 50 set, they have to be accountable and go the time. That's 1000 yards at faster than goal pace. That you can do and your body gets used to it.

“When we have kids that don't buy in they generally come from other programs, but they adapt. You have to get the culture of your program to match what you do. When there is resistance it is often just an information issue and you have to figure out how to help them.”

BRADEN HOLLOWAY, HEAD COACH, MEN'S AND WOMEN'S SWIMMING AT NORTH CAROLINA STATE UNIVERSITY

“My first step in taking over a moribund program was getting swimmers to give themselves credit and take ownership that they are allowed to swim fast all the time. There are no restrictions when you can swim fast or not.

“The mindset is the thing. If you are not willing to swim fast, you are not going to swim fast. So we foster an atmosphere where swimming fast is encouraged and we create concepts that allow that. For instance, if someone puts on fins and paddles and goes :18 in a 50 free, they are probably going to start thinking “Man, with a start and a suit, tapered I could probably go 18 seconds. And they start believing it.

“We challenge swimmers almost daily to do something they've NEVER done before. As soon as they go faster than that on a set or in workout it creates the belief they can go faster.

AT NCSU the Wolfpack has a Christmas tradition where, when tired, Holloway will pick a swimmer to do a 200 stroke swim full suited. “If the swimmer hits the goal time they get out of a round of a traditional set. The last three years a swimmer has gone a crazy, fast time. Each year that athlete in his fastest swim (at ACC's or NCAA's) has gone that time almost to the tenth,” he says.

Sounds like mind over matter. <



COMMON MISCONCEPTIONS ABOUT SUCCESSFUL TRAINING PROGRAMS

BY SERGEI BELIAEV, PH.D. IN METHODOLOGY OF SPORTS TRAINING

THE DRIVERS OF PERFORMANCE

The coaching profession is all about helping swimmers develop their critical skills and abilities and achieve peak performances when they count most. This suggests that among many important skills, coaches should be knowledgeable in

- teaching critical skills at different levels of an athlete's maturation,
- developing critical physical abilities necessary to support performances at desired levels of competition, and
- designing and managing training programs so as to guide athletes to their best performances at the most important events.

All of these categories, with the possible exception of skill building components, fall under the purview of Methodology of Sports Training – a science that studies the effects of different training exercises and defines the most effective methods for their application at different times or periods of preparation.

Methodology of sports training science has been around since the mid-1960s and has accumulated abundant knowledge about the patterns of human reactions to physical exercise, swimming included. Actually, the sport of swimming is considered to be the most advanced and “scientific” among other sports due to its unique nature and standard physical environment, forcing coaches to make every effort very specific.

And yet, in spite of an enormous amount of accumulated knowledge in this field, there remain a lot of misconceptions and myths in the coaching community when it comes to training methods and their perceived effectiveness. . We are starting this series with a discussion regarding selection of the most effective training sets.

MISCONCEPTION # 1: THE VALUE OF “KILLER TRAINING SETS”

It is widely observed that when coaches are asked what they most want to learn from their senior peers or sport scientists,

one answer always comes up first. By a large margin the first answer is almost always about most effective or “killer” sets and workouts. It follows that the majority of coaches must believe that some combination of distances and strokes on a particular rest or repeat interval (send-off time) must have a greater influence on their swimmers' performance than others. Could it be true that access to a particular “golden” set or even to an “ultimate library” of sets may improve your chances of success? Consider the following facts.

DEFINING TRAINING PROCESS

Sports scientists, individually or grouped by a particular sport organization or even a nation, have been attempting to develop a systematic approach to sports training based on research and science since the early 1960s. The elements leading to successful performances are now quite developed and defined, but intelligent management of the training process still remains the central issue of this line of research.

Since we recognize and understand that training is a process, we should also recognize the fact that this process should be managed in order to achieve desired results. By management we mean following a plan with the freedom to tweak, fine-tune, and adjust the specific elements and training parameters as needed to achieve a personal record or target performance. To do this, we need to define the managing parameters of the process and the methods of influencing them. Under managing parameters in training we usually understand the key ergometric, physiological or biomechanical factors that define the athlete's performance. In endurance sports, swimming included, performance is typically associated with the level of development of aerobic and anaerobic energy production mechanisms, often defined as aerobic and anaerobic power and capacity (J. Olbrecht, 2000). One of the main goals of the training process is to improve said individual characteristics in particular sequence and relation to each other.

To accomplish this goal we use different training strategies, approaches and specific exercises. Our goal is to receive a desired training effect in the form of progression achieved in each element of preparedness and in overall performance on specific distance and stroke. Unlike the generic term “improvement” used by most coaches to evaluate progress, we want to use actual individual progression rates since this parameter is much more objective and measurable. To achieve some level of precision and consistency, we also want to test an athlete's abilities by using standard training test exercises which are “standard” because their key parameters are kept constant and connected with weekly targets as required by the plan we adopted.

Weekly and seasonal progression rates can be also used to compare the effectiveness of strategies applied, short and long-term. This approach may eliminate some of the “training systems” trending on the market, such as USRPT, “high intensity” or “race pace” training. The truth is that no training method or strategy can “over perform” the individual adaptation threshold. The

goal of any training process (any “training system” in this case as well) is to optimize training means to match optimum individual level of adaptation at any given time. And “optimization” means full control over training elements and their proper management which no “training system” usually provides.

To achieve some level of optimization (read “control” and “management”), we usually need to identify the initial athlete’s preparedness level and establish the possible improvement rate. The rate of progression or improvement usually depends on a number of factors, where prior training experience and preparedness level, level of maturation, and “adaptability” are among the most important. Preparedness level in sport is usually associated with the level of development of specific physiological mechanisms responsible for the production of energy for whatever duration of time is necessary to cover a specific distance and stroke of competition. It is also a well-known fact that any individual energy paths do not function in isolation but are always interconnected with others. In simple terms – you can be only as strong as the weakest link (or energy system in our case). Sequential development of energy producing mechanisms is then defined as a training strategy where each energy path is improved in coordination with others and in time and sequence necessary to secure total maximum energy release at the time of the most important event. It is important to note that since different training strategies produce different end results, analyses of performances by the progression of results alone, without knowing specific strategies applied in each case, is pointless. This is something to remember when you attend clinics where analyses of a particular athlete’s performance are presented, which is unfortunately quite a common approach to lure coaches to conventions and clinics.

In theory, the training process management task is not that different from managing any production, engineering or money management process. If it is agreed that coaches are responsible for the management of the training processes for their swimmers and teams, then they should be evaluated on the process’s efficiency and group outcome which can be measured in relation to expected goals or target results, not just one or two highly successful athletes whose performances could actually just be anomalies, not necessarily linked or directly the result of the specific training process in use.

IN SUMMARY

To be successful, we need to be in a position to control and manage the training process of our athletes on their way to an expected or record performance. And if this is our goal, then we need to prepare the following elements:

- Well-defined and detailed training plans (in terms of a selected periodization model and strategy, at least seasonal but better annual)
- Specific criteria which will be used to evaluate athletes’ progress (managing parameters we want to control and test sets that we use to control them)

- Established expectations of how key performance parameters should change under selected training strategy (this is usually achieved by comparing actual rates of change in critical parameters with a model. The goal is to stay close to the optimum development pattern under specific circumstances). If and when we have all these elements in place, we can then easily drive and manage the actual progress of our athletes using the rate of change in general performance and its elements in time.

“ IF IT IS AGREED THAT COACHES ARE RESPONSIBLE FOR THE MANAGEMENT OF THE TRAINING PROCESSES FOR THEIR SWIMMERS AND TEAMS, THEN THEY SHOULD BE EVALUATED ON THE PROCESS’S EFFICIENCY AND GROUP OUTCOME WHICH CAN BE MEASURED IN RELATION TO EXPECTED GOALS OR TARGET RESULTS, NOT JUST ONE OR TWO HIGHLY SUCCESSFUL ATHLETES WHOSE PERFORMANCES COULD ACTUALLY JUST BE ANOMALIES, NOT NECESSARILY LINKED OR DIRECTLY THE RESULT OF THE SPECIFIC TRAINING PROCESS IN USE. ”

You may still be wondering, “Where do specific training sets or workouts fit into this scheme of things?” Logically, if you follow this discussion, training exercises (sets) should be chosen based on their effectiveness in achieving a specific training effect in a specific energy production mechanism. Considering the fact that athletes’ needs are different even within one group of athletes training for the same event due to individual differences, each set then has to be evaluated by duration and intensity and fit in with other sets with different objectives. Take any set out of its order in the seasonal or training phase equation and all you receive is just that – a training set without a direction, goal or purpose. Insert it randomly into any workout for any group and you most surely will achieve a “monkey wrench” effect.

Are you still convinced that a “killer set” is what you are looking for?

CONCLUSION

Training sets are just a tool to achieve a specific goal in an athlete’s development process. As such, process logic and design should govern training set selection and their application on different days and in different training phases. It is very important to note that adoption of somebody else’s training sets is not appropriate in most cases unless they are based on the same or well defined criteria defining their targets and adjusted to the needs of specific level or age group. Each and every training set is ALWAYS a solution to a specific task that coach is trying to achieve. So, you need to know the basis which is used to identify your training zones (and we highly recommend that you look at energy production mechanisms as your main criteria for development specific abilities) and always connect training sets by modality and design with specific goals you are trying to achieve. ◀

UNDERWATER WITH RYAN HOFFER

BY BRENT RUTEMILLER PHOTOS BY TAYLOR BRIEN

Swimming Technique Magazine visited the Scottsdale Aquatic Club in Scottsdale, Arizona to talk with Ryan Hoffer and his Coach Kevin Zacher about Hoffer's amazing underwater technique in the 50 and 100 freestyles.

Back in December 2015, Hoffer set a 17-18 National Age Group record with a time of 41.23 in the 100-yard freestyle. His time was only .15 off of Nathan Adrian's American Record. The 17 year old, High School Junior, was out in 19.73.

Coach Zacher talked about some of the drills and training sets that he designed to improve Hoffer's underwater elements.

"Our goal is to get to the 15 meter mark around 4.9 seconds off a start. We do a number of drills to get to that point. Right now we can get there in 5 kicks. It used to be 9 and then 7. After the start Ryan is under water for about 3.5 seconds. So the goal is to get 5 quick, powerful up and down kicks in before the breakout. Off a turn, we try to get to the 15 meter mark with 9 kicks in 5.7 to 6.0 seconds," said Zacher.◀

Coach Zacher shared some of his favorite sets and drills that he uses to improve Hoffer's underwaters and breakouts.

VERTICAL KICKING DRILL FOLLOWED BY DIVES (FIG. 1)

3 x (10 seconds on then 20 seconds off. Trying to get 25 to 30 kicks in per round) 2 x (25 yards from dive max efforts to 15 meter mark)

VARIABLE SPEED DRILL NOTE: COURSE IS SET AT 25 YARDS ACROSS 50 METER POOL (FIG. 2)

3x (4 x 25 yard no breath, dolphin kick with fins, each 25 has a different kick count) 1) Kick 1 time every time you cross a lane line; 2) Kick 2 times every time you cross a lane line; 3) Kick 3 times every time you cross a lane line; 4) Kick whatever feels right



Coach Kevin Zacher, head coach for the Scottsdale Aquatic Club since 2008, has produced Olympic Trial qualifiers and national ranked swimmers over the years, but Ryan Hoffer stands out as one of his best swimmers and one of the fastest athletes in the United States today.



FIG. 1

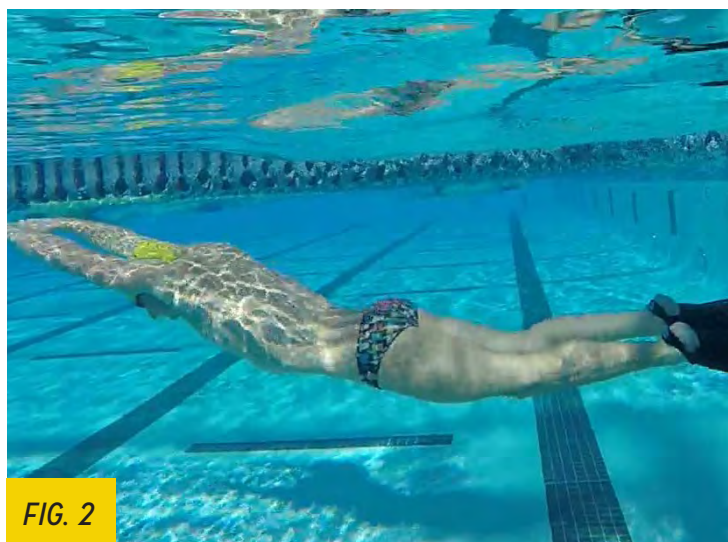


FIG. 2

DEEP WATER PUSH-OFFS (FIG. 3)

(SET IS DONE IN 12 FT DIVING WELL)

3 x (Push-off bottom of diving well accelerating out of the water;
3 x 25 underwater kicks) Goal is to transfer the energy from
bottom push-offs to underwater kicks

SENSORY DRILLS (FIG. 4 & 5)

3 x (25 yards w/ drag socks; max effort to 15 meter mark) - (fig 4)

2 x (25 yards without nets on feet; max effort to 15 meter mark)

3 x (10 seconds on and 20 seconds off sculling only)

2 x (5 Seconds sculling vertically and then move into horizontal
position and explode with 4 – strokes) (fig 5a-c)

RACE PACE SETS

50 Race from dive @ 40

50 fast kick @ 50

3 x 25 @ 25 - 100 Speed with 15m underwaters

(goal pace 10.0-10.2)

75 EZ

HOPOXIC SET

5 x 50 (3 breaths)

25 (Roller Coaster: Relaxed big up and down kicks)

25 (1 breath)

25 (0 breaths)



FIG. 3



FIG. 5a



FIG. 4



FIG. 5b



FIG. 5c



COACHING AND SPORT SCIENCE: THE ROLE OF THE BIOMECHANIST

BY ROD HAVRILUK, PH.D. - SWIMMING TECHNOLOGY RESEARCH

The failure of sport scientists to work effectively with coaches is well known. The reasons that coaches are justifiably cynical of science were explained in a landmark article on the “Downfall of Sport Science” (Stone, Stone, & Sands, 2004) and included:

- the mistaken application of results from studies on normals to high performance athletes
- promises of “cutting edge research” that did not result in improved performance
- promotion of fads and gimmicks with “pseudo-science”

Explanation of the problems and the process of integrating biomechanics into coaching will hopefully encourage coaches to reconsider the value of science for helping their swimmers.

SKEPTICISM ABOUT BIOMECHANICS

Biomechanics is just one field of sport science. It applies the principles of physics to swimming movement. Some of the most important principles relevant to swimming are:

- leverage (mechanical advantage)
- the drag equation for resistance
- the drag equation for propulsion
- Newton’s Laws
- conservation of angular momentum

There is no controversy about the validity of these principles. The problems (like skepticism) develop from the application (actually, misapplication) of these principles. In fact, there are numerous examples where a misapplication of a mechanical principle is now accepted as “conventional wisdom.” Two dozen examples are explained in a series of articles on misconceptions in *Swimming World* (Havriluk, 2014-2016). The vast majority of swimmers, unfortunately, have already been negatively affected by misapplication of at least one of these principles.

Possibly even more confusing is that concepts are often promoted with a single physics principle and without accounting for all the relevant principles. For example, application of one principle may produce a more streamlined body position, and consequently, reduce resistance. At the same time, strict adherence to that one principle would compromise a swimmer’s ability to take advantage of other principles, such as those related to generating propulsion. The result would be a net loss in performance.



Figure 1. Data captured by a biomechanist must be immediately available to coaches and swimmers. In this image, the swimmer is shown quantitative data immediately after a test trial.

Swim coaches have many reasons to be skeptical of biomechanics. To restore the confidence of coaches, the biomechanist must:

- accurately apply all relevant physics principles
- provide examples using quantitative data to confirm the value of each principle
- analyze each swimmer with respect to the principles that will have the biggest impact on performance for that swimmer

BIOMECHANICAL TESTING AND ANALYSIS

A biomechanist typically provides two primary services for coaches: testing and analysis. Based on the Stone et al. article, a three-point test can assess these services. Information must be:

1. immediately available
2. understandable by coaches and swimmers
3. presented in a format that the coach can use with the swimmers during team training

To meet the requirements specified by Stone, a biomechanist must:

- capture quantitative data in a manner that makes it immediately ready for analysis (Figure 1)
- analyze the data with respect to critical and familiar body positions (Figure 2)
- associate specific body orientation cues with each body position (Figure 3)

The main benefit of an accurate quantitative analysis is that it will take the guess work out of the direction for a coach to proceed. The analysis will clearly identify the technique elements that have the greatest impact on the swimmer's performance. Armed with clear and accurate data, a coach is better prepared to suggest changes to improve technique.

QUANTITATIVE DATA TO SUPPORT THE COACH

Once testing is complete, there are three options for the analysis. The analysis session can include:

- the swimmers
- the coaches
- or the swimmers and coaches together

The first option, giving the information only to the swimmers, is the least desirable feedback option (but sometimes unavoidable). If the information is given to the coaches alone, the swimmers may not receive the information immediately after their performance. If the information is given to the swimmers and coaches at the same time, they may immediately begin using the same language to communicate about technique.

After the analysis, a coach can address each swimmer's technique elements in two ways:

- reinforcing positive technique elements
- improving technique limitations

It's vital to acknowledge that all swimmers have positive technique elements. After an analysis, each swimmer must continue to track his/her positive technique elements to retain those advantages. While maintaining the positive technique elements, a swimmer can then work on dealing with limitations.

RETESTING FOR CONTINUED PROGRESS

After swimmers have had adequate time to work on changes, it is appropriate to schedule another analysis. Scheduling primarily depends on the results of the coach's instructional intervention. If a coach conducts regular instructional treatments (e.g., daily), a re-analysis may be appropriate in a few weeks. If treatments are less frequent, a re-analysis may be appropriate after a few months. If more than six months transpires between analysis sessions, the swimmers are less likely to remember information from the previous session.

The primary value of a follow-up analysis is for swimmers to learn what they have changed, and what they have not changed. The secondary purpose is to determine a selection of more advanced skills to address next. Because swimming technique is complicated, the analysis/instruction process must be repeated throughout a swimmer's career. Even the most technically proficient swimmer will benefit from continued quantitative evaluation.

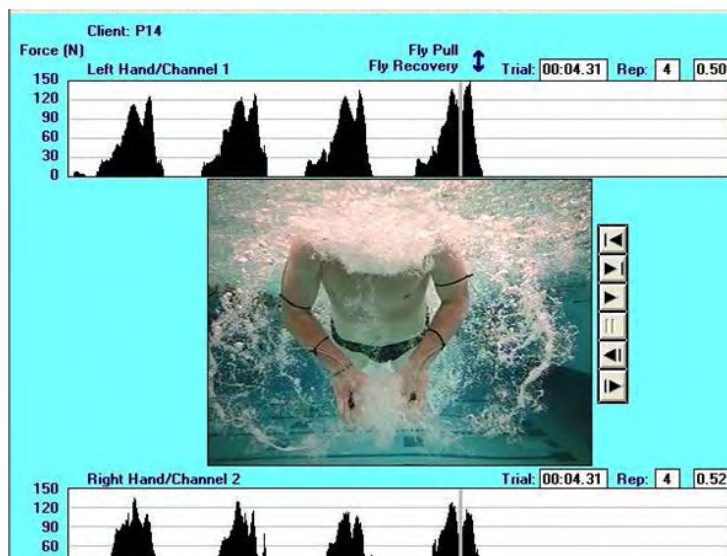


Figure 2. The quantitative data should reinforce positive technique elements and clearly identify limitations. This image does both: this swimmer has an impressive increase in force in the middle of the stroke, but needs technique adjustments at the beginning of the pull and the end of the push.

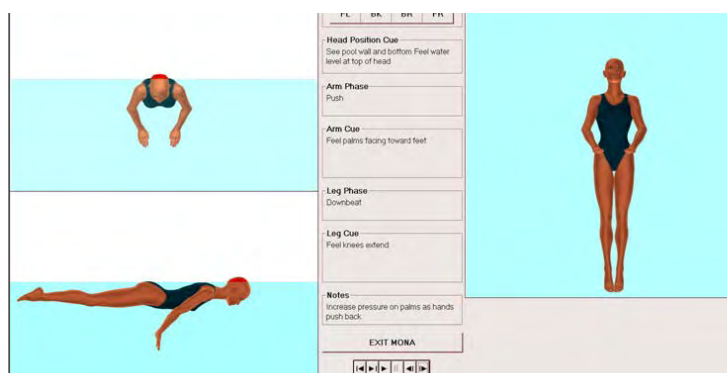


Figure 3. The analysis must include specific cues for each body position. Following these cues helps a swimmer to self-assess technique and monitor performance.

SUMMARY


A biomechanist applies principles of physics to swimming motions. The biomechanical testing and analysis process quantifies key technique elements to clarify the impact of relevant physics principles. A primary benefit of the biomechanical analysis is that the data eliminates guesswork and provides the coach with specific technique information to help a swimmer progress the most. The coach can then reinforce positive technique elements and provide instructions to adjust technique. Continually repeating the testing/analysis/instruction process throughout a swimmer's career offers the best opportunity for a swimmer to reach the highest level of technique proficiency. ◀

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Author Notes

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SPORT PSYCHOLOGY & COACHING

BY DR. JOHN HEIL

[PHOTO COURTESY OF ANDY RINGGOLD/ARINGO]

The mental game, the zone, focus – by whatever name, the meaning is the same. Success in sports is linked to psychological skills. The search for the mental edge in competition has given rise to sport psychology.

Sport psychology can take many forms. It is both set of ideas, and a guide to action. At its best, it resembles coaching in that it is practical, sensible, and improves performance by developing competitive skills. Of course, there is no magic, no shortcuts. For sport psychology to work, it takes a committed effort over time. In essence, mental skills must be developed and refined through practice and repetition much like physical skills.

Psychology is in play wherever coaches are coaching and athletes are training. In a team setting, the sport psychologist works as a partner to the coach, assisting the coach in training mental skills. It can be useful to think of the sport psychologist in parallel with the dryland conditioning coach. Just as the dryland specialist deals with the basics of physical fitness and sport skills, the sport psychologist deals with the fundamentals of mental performance. Both roles have arisen as a consequence of a growing body of theory and research in sport science, and increasing specialization within coaching.

Working with the coach to identify the athlete's mental strengths and the areas that he or she would like to improve, is the first step in sport psychology. The next step is to set specific and realistic goals for developing and refining mental skills. As one strives for competitive excellence, success is foreseen in the mind's eye. In this sense, seeing gives rise to believing. Envisioning the path to success is a common element in coaching and in sport psychology.

Sport psychology is designed to systematize and refine the athlete's mental game already shaped through trial and error of training and competition. This is reflected in an anecdote told about Jim Thorpe. A professional baseball and football player,

and 1912 gold medalist in the decathlon, Jim was probably the greatest athlete of the 20th century. Like the rest of the Olympic team, training was seriously curtailed as they traveled on board ship to Sweden for the 1912 Olympics. One day, Jim was observed to be sitting quietly by himself, eyes cast downward looking at the deck. Someone approached and asked if things were all right with him. He responded that he was fine. Jim then pointed out two marks that he had made on the deck mentioning that it was the distance he planned to cover in the long jump. Jim Thorpe went on to have a successful long jump, to win the gold medal in the decathlon, and to be named "the World's Greatest Athlete" by the King of Sweden.

Like Jim Thorpe, all outstanding athletes have a strong mental game, but are often silent about it. Until recently, we have lacked the means for sharing the mental secrets of successful performance from one athlete to the next and one generation to the next. Sport psychology has appeared to fill this void.

In practice, sport psychology focuses on both the well-being of athletes and successful performance. However, the heart of sport psychology is in performance enhancement through mental training. Mental training methods include relaxation/activation, refining concentration, creating positive mental imagery, optimizing self-talk and developing competition routines. The pressures of sport can also bring about problems and sport psychology will deal with these too. Specialized approaches have been developed to work on managing pain and injury, dealing with overtraining and burnout, and coping with issues ranging from retirement to substance abuse.

Sport psychology is a by-product of psychology and the sport sciences. Absent science, sport can quickly be reduced to a guessing game. It is the standard of proof that science provides that helps separate junk science from real science and training fad from training fact.◀

AN INTERVIEW WITH DOUG FONDER

BY DR. JOHN HEIL

Doug has been honored by Swimming World Magazine as one of the “Top Ten” most impactful people in swimming for 2015. In the interview that follows he talks about his personal background in swimming and the critical role of sport science in coaching.

WHY WAS THE INTERNATIONAL SWIM COACHES ASSOCIATION (ISCA) CREATED?

Being a top level coach is like putting together the pieces of a puzzle. With all the current developments in coaching and sport science, this is becoming increasingly challenging. We began ISCA is to help coaches sort through this information by incorporating the experience of elite level coaches with sport science.

WHAT DREW YOU TO SPORT SCIENCE INITIALLY?

I started coaching in the early 70's. As years went on, and there was more and more information to absorb, I came to a realization. For swimmers to go faster they need to be bigger, stronger, and smarter. To get swimmers to be bigger, stronger and smarter, we need specialists with more in-depth knowledge than the coach. This is the role of the sport scientist. The increasing volume and specialization of knowledge out there is just too much for one person to manage. This is why we want the coach and sport scientist to work as a team.

HOW DO SPORT SCIENCE AND COACHING WORK TOGETHER IN PRACTICE?

For an athlete to get the best results, training needs to be based on a marriage of sport science and coaching. To get the best stroke, the coach and the biomechanist need to work together. To get the best mental game, the sport psychologist and the coach need to work together. Each of the disciplines in sport science contribute a piece to the puzzle. Then, it is up to the coach to pull all these separate pieces together.

WHAT DO YOU THINK PREVENTS COACHES FROM USING SPORT SCIENCE?

To excel as coaches we need to be in the mode of continuous learning and improvement. Unfortunately, some coaches become so comfortable with the familiar that they are reluctant to venture out. Others are suspicious of science. In part this has to do with the unknown. But this has probably been made worse by the false claims of junk science. For these reasons, we have carefully selected a team of top level sport science specialists to be a part of ISCA.

HOW IS SPORT SCIENCE INCORPORATED IN ISCA?

We want to drive coaching forward by carefully sorting and choosing from the wealth of information available. For this reason, we have our own Sport Science Group, who play a critical role in the organization. At our yearly conference, we blend the sport sciences and coaching together in our program. We are also developing a coaching certification program that includes sport science. Anyone in this day and age who is a naysayer to science is a naysayer to progress. ◀



[PHOTO COURTESY OF VIRGINIA GATORS]



[PHOTO COURTESY: AZARIA BASILE]

» TYLER FENWICK

CHALLENGING DISTANCE SETS

BY MICHAEL J. STOTT

Tyler Fenwick is intimately acquainted with distance-based practices. His baptism came from years of training under Richard Shoulberg at Germantown Academy and honed as a coach under Bill Rose at Mission Viejo. At MVN he had great success working with senior level age groupers and now trains many distance swimmers at the University of Tennessee. The workouts that follow offer insight into what has allowed athletes like Janardan Burns, David Heron and Alex Meyer to emerge as national class open water swimmers.

Below are three workouts from the 2011-12 season at Mission Viejo. They were for athletes focusing on making the Junior Pan Pacific Championship team in the 400-1500 and Open Water. Says Fenwick, “In September, we made a plan to focus on April’s Open Water Nationals in Ft. Myers, knowing that spots on the Pan Pac Team would be available to the top three 18- under finishers. We studied race paces and concluded that to be competitive they needed to be able to hold 1:10’s LCM for about 9000 meters and have enough left in the tank to close much faster. These were extreme paces and we needed a comprehensive plan to develop that sort of mental and physical toughness.

“We spent the month of September and most of October charging our aerobic systems. We had lots of longer sets to not only prepare the athletes physically, but also mentally for a two- hour race. I started introducing 1:10 intervals in the beginning of October. It was hard to get to 10 x100 @ 1:10 LCM at that point. Fortunately, I had some very focused young

men who adapted quickly. The first set illustrates a lot of the work we were doing in September/October. It’s a 7,200 meter ladder starting at 1:20 intervals and then swimming the back half on 1:10 with fins. This helped get the group accustomed to that speed. We were doing sets like this two times a week.”

45 Min Land

{600}
24 x 25 on :30

{7,200}

1x {
1 x 100 on 1:20 Free
1 x 200 on 2:40 free
1 x 300 on 4:00 free
1 x 400 on 5:20 free
1 x 500 on 6:40 free
1 x 600 on 8:00 free
1 x 700 on 9:20 free
1 x 800 on 10:40 free
1 x 800 on 10:00 Free Under 9:20
1 x 700 on 8:45 Free Under 8:10
1 x 600 on 7:30 Free Under 7:00
1 x 500 on 6:15 Free Under 5:50
1 x 400 on 5:00 Free Under 4:40
1 x 300 on 3:45 Free Under 3:30
1 x 200 on 2:30 Free Under 2:20
1 x 100 on 1:15 Free Under 1:05 }

{2,000}
10 x 200 on 2:25 p/f/s free
9,800 Meters

“The next practice is from the end of November from that year. The boys had acclimated well and were able to handle 8,400 meters at 1:10 including 50 x 100@ 1:10 without fins. They pushed through a significant amount of mental and physical fatigue during this practice, but by the end, it was obvious this was going to be a special season,” says Fenwick.

{1,800}
3x { 1 x 300 on 4:00 free
1 x 200 on 2:30 free
1 x 100 on 1:10 free }

{5,000}
50 x 100 on 1:10 Free
or 5@ on 1:10 & 5 on 1:20 - 5 times thru (More >>)

{3,400}
{1 x 800 on 9:20 Fins
{1 x 700 on 8:10 Fins
{1 x 600 on 7:00 Fins
{1 x 500 on 5:50 Fins
{1 x 400 on 4:40 Fins
{1 x 300 on 3:30 Fins
{1 x 100 on 1:10 Fins

{3,000}
60 x 50 on :50 0-Goal Mile pace

35:00 Land
13,200 Meters

“The last set is from late March right before we began resting for Open Water Nationals. Janardan Burns was able to complete 75 x100 @ 1:10 LCM and David Heron went 101 on 1:10 without equipment or rest. Where we may have passed a proven physiological benefit well before the boys reached 75 or 101, this set was all about confidence. They had progressed throughout the season, believed in the plan, were ready to taper and were able to push their bodies to points they could not have imagined months before. (fig.3)

{1,200}
24 x 50 on 1:00 1 3 under :35 - #4 is at 200 pace
{10,100}
101 x 100 on 1:10 Free
{2,000}
1 x 2000 on 30:00 Swim with Buoy and snorkel
1 on 45:00 Land

13,300 Meters

“They went into Nationals as two of the youngest in the field, both were 16. They hung with the lead pack for the first 9k and then took off together finishing second and third, making the Junior Pan Pac Team and the U.S. National Team. They went on that summer to additionally qualify for Junior Pan Pacs in the 400 and 1500 and taking gold and bronze for Team USA in Hawaii.

IN KNOXVILLE

“Here is a typical broken 10k we do at Tennessee on Monday afternoons. Like at MVN, these are sets you need to build up to. It’s not something most visiting athletes can handle right away. These are workouts our athletes love and hate. They are taxing and take a lot of focus but also evoke tremendous confidence if done well. They change weekly to manipulate distances, intervals and speeds. The level of difficulty increases significantly as the season goes along. A major focus for our

team is controlling exertion in any length of race. We want to be able to swim very fast, but keep our heart rates low. The athlete should always be in control.

“You never know what pace an open water race will take. There are a ton of factors so you have to be prepared for anything. We train to push our bodies to the absolute limits and expand those limits weekly in practice. We always want our fastest swimming at the end, but these sets will test an athlete throughout. You have to earn the right to go to those high speeds at the conclusion of a set. There is no sandbagging in Knoxville!”

LCM (David Heron and Alex Meyer)
2x300 on 4:30 Warmup on own
1x
{ 1x500 on 5:30 HR 170 (1:06 pace)
1x500 on 5:50 HR 160 (Under 1:09 pace)
2x1000 on 11:30 HR 165 (2nd faster than first)
2x500 on 5:50 1)UN 5:40 2)UN 5:35 (1:08 ->1:07)
1x2000 on 23:20 UN 23:00 (1:09 with a low HR)
2x500 on 5:50 Odd 100's UN 1:08
3x1000 on 11:40 Descend 1-3 to all out race - Alex Meyer and David Heron Descended to 10:30 and 10:32 here, which is about 1:03's }

10x100 on 1:20 Warmdown

30:00 Land

“This last set was one for All-American Evan Pinion. We were working on the back half of his 400 and 500 freestyles and building into the races. The speeds required at the end of this set take a lot of discipline, self-control and heart! This was not a set we knew Evan could make, when he did, it was pretty awesome to watch!” ◀

4x500@5:40 Pulling Hold 5:00
5x200@2:00 Under 1:50 (1:48, 1:47, 1:47, 1:48, 1:46)
3x500@5:30 Pulling Hold 5:00
4x200@1:55 Under 1:45 (1:42, 1:43, 1:43, 1:43)
2x500@5:20 Pulling Hold 5:00
3x200@1:50 Just Race! (1:40, 1:41, 1:39)



[PHOTO COURTESY: SOOBUM IM-USA TODAY SPORTS]

GETTING READY TO RACE

BY MICHAEL J. STOTT

Taper time. Is ushering swimmers through this period art or science? Experienced coaches aver it is both though the most successful seem to have a magical touch. Disappointed athletes at championship meets would do well to remember Jon Urbancheck’s prescient observation. “Swimmers don’t miss tapers, just the training.”

Below are two taper programs that have produced outstanding results. The first comes from Peter Verhoef, Senior 1 Lead Coach at SwimMAC Carolina and associate head coach at Queens University. An NCAA All-American at Georgia Verhoef implements a taper program, called “meet preparation,” that is directed by David Marsh and adapted for individual training groups.

PETER VERHOEF

“At SwimMAC, tapering is not a separate part of the season – it is the culmination of a season’s worth of preparation to race at an athlete’s physical, emotional, and technical peak. All three areas are addressed and practiced during the lead up to a championship meet (or in many cases multiple championship meets). It is important for athletes to value working through taper time as they strive each day to perfect their strokes, build confidence in their race plan and skills, and recover from racing efforts quickly and efficiently. Overall, recovery becomes a huge priority during this time of year and is mostly addressed away from the pool with sleep, great nutrition, and

emotional organization. Athletes who have great meets are often the most prepared athletes in terms of the confidence they have in their abilities, the amount of practice they have done at or close to their race speeds and how much they have let their bodies and minds rebuild for a three-to-five-day meet. It is great to add in FUN during this time of year – a joke of the day or a fun story to start practice or a meet session is an important part of making the preparation for the big meets exciting and enjoyable.

“We generally start a three-day cycle of meet preparation practice two-to-three weeks prior to a meet. The daily pattern is simple and helps keep athletes and coaches focused on the most important parts of preparation. It is important to ‘de-clutter’ these practices and let the main focus be first and foremost. The three day pattern is **SPEED – PACE – AEROBIC (SPA)**. The day before the meet starts is typically an ‘Aerobic Day’ and the pattern builds back out from there. Double practices get shorter and then are dropped a week out to promote sleeping. Sundays are off and the pattern is adjusted slightly each week so there may be a hybrid or a repeat of the speed or Aerobic days. The pattern usually starts around 80 percent of the training volume of the previous cycle and slowly decreases down to about 60 percent of the volume – really not much lower as most athletes are preparing for three-to-four day prelim/final meets with a healthy number of swims!

“**SPEED** days start with an engaging warm-up focused on technical skills and turns. The main sets of the practice focus on developing and refining the swimmers ability to swim fast! Often this involves equipment like fins and paddles or Resisted/Assisted stretch cords. The total distances swum fast are broken down into short enough chunks that the athlete can maintain best form and high speed throughout. The other purpose of the SPEED day is to prepare the athletes bodies for racing components the following day. Descending sets help the athlete dial in to race speeds, especially for longer distance swimmers. This is also a great day to work on starts and include some explosive dryland exercises.

“**PACE** days are all about race focus, starting with a rehearsal of a meet warm-up, from dryland activation to in-water patterns. Often the athletes are given 30-to-40 minutes to direct warm-up on their own once we have practiced this as a group a few times. The main sets of the day will be broken swims, pace repeats, and in some cases sprints beyond race speed. Practice will include cooling down properly and for some athletes a short aerobic set with great technique to finish may help recover them for the next cycle. If incorporating dryland, following this practice is a great place to include it.

“**AEROBIC** days are more likely called an ‘Active Regeneration’ day. The two main focuses are emotional relaxation and physically rebuilding the body by staying away from maximum effort exertions. On these days swimming steady and with great form is the key. Breath control patterns, kick-out counts and other drills can be used to keep it interesting. Athletes should leave feeling rejuvenated and excited for the next cycle. For some athletes more is better, just staying away from swimming ‘hard.’ It is also a good idea not to add in extra dryland on these days unless it is a stretching or short core routine the swimmers frequently do. These are great days to get out of practice a little early to get ahead on school work!”

SOME SAMPLE SWIMMAC TAPER SETS

“SwimMAC athletes, early in the meet preparation phase or sometimes earlier, do sets David Marsh used with his Auburn and SwimMAC Elite athletes:

-Long Course 100s broken at the 50: Number of rounds is determined by distance away from the meet.

-First 50 is from a dive, swimmer starts only focusing on best form with a very smooth effort.

-Second 50 is from a push with a goal to go 2nd 50 of 100 pace. For some top level sprinters this can be unrealistic and can be adjusted to +1 second or similar says Verhoef.

-If the swimmer makes the goal time on the first round, they ‘earn’ the right to go faster on the first 50, progressing to as close as they can to a full broken 100 at goal speed.”

“For more distance type athletes, we have found that it is important to develop a feel for pace after swimming through a turn or coming off of a build effort. It is often misleading for distance swimmers to swim repeat 50s at 1000 or 1650 pace as this pace is relatively easy to hit if given enough rest. A better version of pace is to do the following (for 1650 or 100 pace). On a great day some athletes can swim well faster than pace; it is important to stick to the pace and stroke rates they plan to use on their championship day.

300: 200 steady build and the last 100 at pace

3 x 50 to the foot @ 10-15 seconds rest, all at pace

200: 100 steady build and the last 100 at pace

1 x 150 hold pace

“For IMers breaking down the race to create speed within the strokes works well. To prepare for a 200 IM for example, DII NCAA Champion Matthew Josa really felt this set prepared his breaststroke and freestyle tempos and strokes for how they would feel in a race.

75 Fly @ 1:15 make -- each 25 faster (dive or push is fine)

3 x 50 Backstroke @ :50 negative split each one and also descend to 200 goal pace

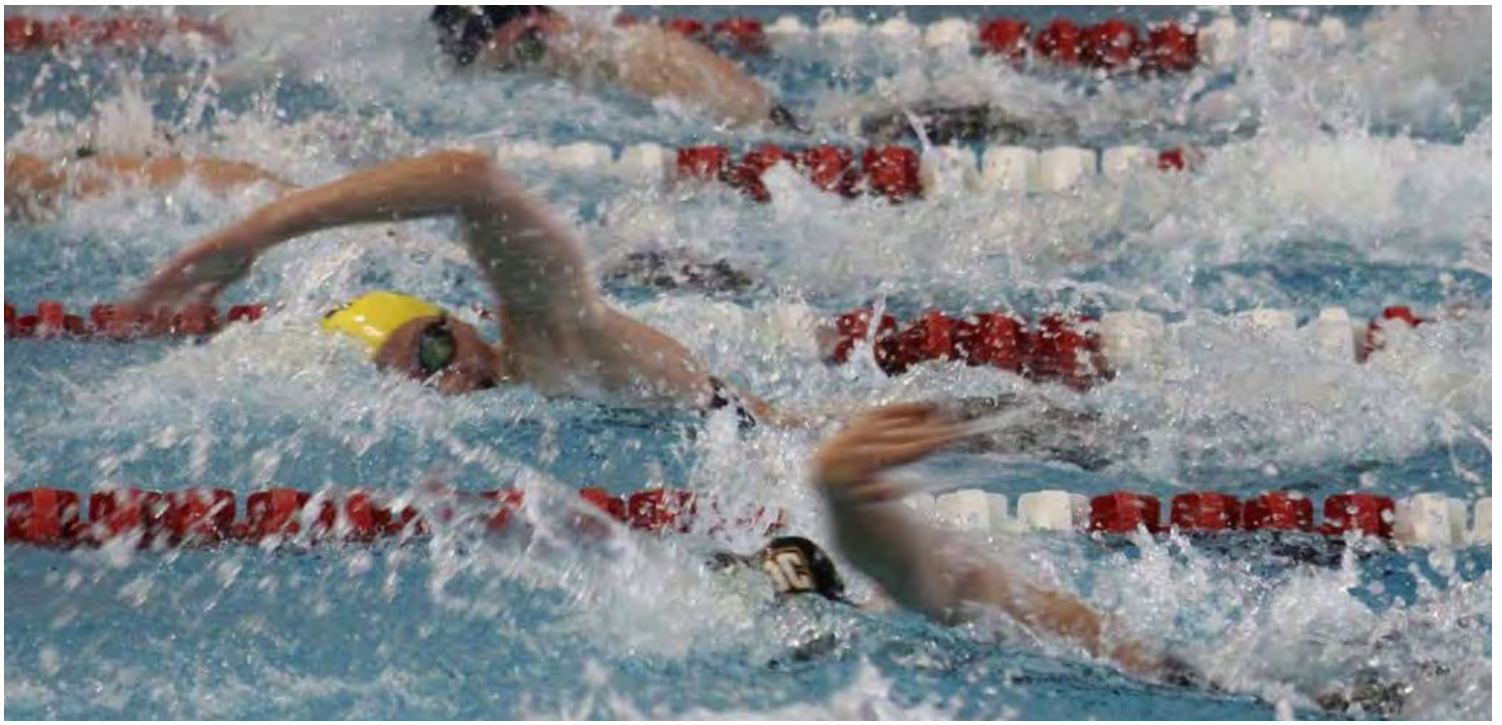
6 x 25 Breaststroke @ :25 all Fast!

75 Free – Use Race turns and kickouts you plan to use when racing. “Matthew could swim the fly 75 in under 40 seconds from a push, descending down to 24 on backstroke, and holding 13+ seconds in breast with his ideal race tempo and stroke count. He finished with a 75 free at 37 seconds, with the last kickout to 12.5 meters. At DII Championships he set the NCAA record with a 1:41.92, splitting 22.11, 24.92, 29.84, 25.07,” says Verhoef.

BRIDGER BELL

Bridger Bell is the head age group and assistant national team group coach at Team Santa Monica (CA). He was previously an assistant at Johns Hopkins University while head-coaching the St. Paul's Schools in Brooklandville, Md. and previously he coached at The Westminster Schools in Atlanta.

“Our last two years at The Westminster Schools developing this taper program our swimmers first had 44 lifetime best times out of 48 swims at State, and then 43 of 51 when our girls won the state meet. I have carried this program forward to other teams and seen swimmers succeed at similar rates. For a double taper, our swimmers hit near peak season yardage/intensity again the day after the first taper meet before coming back down leading into the second taper meet. *continued >>>*”



For each taper program, if time allows, we implement a two-week (cycle (occasionally longer for a few individuals) featuring the following key sets:

TAPER MONITORING SET

“The taper monitoring set we got from Bill Smyth at Boston University. We do it every three weeks early in the season, accelerating to every week the last two weeks before meet week.

4 x 50 @ 3:00 or 4 x 100 @ 3:00 (400/500+ swimmers do 100s)

“We record all times on this set throughout the season. During our taper, we expect times to come down significantly and also expect a better hold across the four repeats. Some swimmers, especially our purest sprinters, aren’t expected to hold perfectly. There is a degree of art and intuition/knowledge of our swimmers that comes into play; we do not try to make it an exact science. We watch each swimmer’s times on the set through the season and learn how training, fatigue and rest affect set performance to help us know how to individualize the taper for that swimmer. If an individual swimmer’s times aren’t coming down or aren’t holding after we’ve dropped yardage, then we have that swimmer come down more steeply.

RACE REHEARSAL

“Swimmers rehearse the stroke counts, breathing habits and underwater distances planned for the race.

100’s: odds with fins, swimming smoothly (no splash). Evens no equipment broken @ 80 percent of race pace (75-25, 25-50-25, 100-50-50).

200s with no equipment, broken (150-50, 50-100-50, 100-50-50) at 80 percent of race pace.

Early the week before meet: 8 x 100 @ 2:30 or 4 x 200 @ 3:00 Race Rehearsal. (400/500+ swimmers do 200s)

Late the week before meet: 6 x 100 @ 2:30 or 3 x 200 @ 3:00 Race Rehearsal

Early the week of meet: 4 x 100 @ 2:30 or 2 x 200 @ 3:00 Race Rehearsal

Late the week of meet: 2 x 100 @ 2:30 or 1 x 200 @ 3:00 Race Rehearsal

DESCENDING STROKE COUNTS, BREATH COUNTS, LENGTHENED UNDERWATERS

“All of our swimmers – sprint, mid-distance and distance – do extended swims (repeats of 500 to 1200) freestyle or alternating free and stroke (in varying patterns) with individualized equipment targeting points of stroke emphasis for that swimmer. Swimmer aids include ankle bands, pull buoy between the feet, sticks (for catch-up stroke) and snorkels. During these swims, swimmers extend/lengthen underwaters, cut strokes and cut breaths each 100 or each 200. We believe this has helped our swimmers hone stroke efficiency leading into championship meets without the coaches cluttering swimmers’ minds and confusing their strokes with frequent stroke feedback cues (unlike earlier in the season, when we strive to give all swimmers frequent feedback).

GOAL TIME WITH FINNS

“A few days before meet: 1 x 100 or 1 x 200 with fins @ goal time with same underwater distances the swimmer will use in the race (without equipment).” ◀



FASTER BEFORE FITTER

BY WAYNE GOLDSMITH

"Adding more sessions to a swimmer's program is the last resort" - Gennadi Touretski (Coach of Multiple Olympic Gold Medalist / World Champion and World Record Holder Alex Popov)

Again and again we see it.

In New York. In Chicago. In Florida.

In Australia. In England. In Africa. In Asia. And all over Europe.

Everywhere - all over the world - it happens.

A swimmer races in a Meet.

He/she loses.

In response to the poor performance, the coach adds another workout to the swimmer's program.

Or...a parent insists that the coach add another workout to their child's program.

The immediate reaction—the default solution—to a losing performance is: "This swimmer is not fit enough." And the obvious answer to his/her performance problem is to do more training.

And the stupidity of this knee-jerk reaction to a poor swimming performance is the same in every corner of the swimming globe:

*It's **Faster**, not Fitter.*

FITNESS FIRST?

SWIMMING MORE SESSIONS IS NOT THE BEST ANSWER.

Fitness—speed, strength, endurance, power—is important. Physical conditioning is, of course, essential for successful competition at every level of swimming.

However, it's not the only aspect of fast swimming—just as having a large motor is not the only aspect of having a fast car.

The issue is that it's easy to do more work—and anyone can do it. Get out of bed, show up for an extra session or two...and all your performance problems will be solved. Or so you think.

It is far more difficult and far more challenging to look at things such as technique, skills, mental abilities and tactical skills than it is to simply swim more laps.

Yet, over and over and over again, we see young children doing more and more work for no reason other than it—i.e., doing more training—seems to be the obvious way to improve one's competition performances.

WHY IS THIS SO IMPORTANT?

THE SO-CALLED "DROP-OUT" SYNDROME.

There are millions and millions of kids involved in learn to swim programs, mini-squads and stroke schools all over the world.

Yet, when it comes to competitive swimming - particularly for 15, 16, 17 year olds - there's practically no one in the meet programs!

Have a look at your own local Meets - doesn't matter where in the world you're reading this post - it's the same everywhere:
Under 9s 50 backstroke....20 heats.

Under 12s 50 backstroke...14 heats.

Under 16s 50 backstroke...1 heat. *continued >>>*

Why? Haven't you ever wondered why?

Simple.

It's because when swimmers from those younger age groups turned up for training the week after the meet, they were told, "You're not fit enough," and they were advised that they needed to do more training!

Or...Mom and Dad, frustrated with a perceived lack of progress, demanded that their child be allowed to swim extra training sessions.

In other words, because everyone assumes that the only way to improve is to swim more laps in training, we have 9-, 10-, 11- and 12-year-old swimmers training eight to 10 times a week... and by the time they get to be 14, 15 and 16—when life, cars, social life, other sports and study are incredibly appealing—they decide they've had enough!

Do you need to train consistently hard to get to the top? Of course. There are no short cuts to high performance success.

But are there other ways to train hard and improve your Meet performances that don't involve just swimming more laps in training? You bet.

PARENTS - FORGET WHAT OTHER KIDS ARE DOING

Swimming parents need to understand this more than any other group of people involved in the sport.

It is common for swimming parents to sit in the stands and compare the training loads of their children.

"How many times a week does your child swim?" one asks.

"Three times a week", the other replies.

"We're only doing two sessions each week", says the first parent.

"Well, our coach says that all eight years old must swim at least three sessions a week if they want to improve", says the other parent.

"Mmmm", says Dad. "Your son beat our son today. Your coach must be right. I'll have to go and tell our coach we're not doing enough training".

Why do parents do this?

Because they love their kids and want nothing but the best for them. That's perfectly normal and natural.

But parents will often misunderstand what it takes to swim faster. As most parents lack the training and experience of a qualified coach, as a "lay-person" the most obvious answer they arrive at to helping their child improve in the pool seems to be

to have them swimming more laps in training.

The swimming-parent logic goes like this:

- *I love my child and I want them to do well.*
- *That other child is defeating my child in races. That hurts me and upsets my child.*
- *That other child is doing 5 sessions a week: my child is only swimming 3 sessions a week.*
- *Therefore if my child also does 5 sessions a week they will win.*
- *I'll tell the coach to allow my child to do more sessions OR I might even go and swim for the other team where my child can do more sessions.*

Parents need to try and adopt of long term, holistic development philosophy where their immediate desire to see their young children swim fast does not compromise the opportunity for their child to realize their peak performance potential as mature athletes.



THINK DIFFERENTLY - PUT FITNESS LAST.

What if you approached swimmer development differently?

What if - you placed the development of the physiological capacities of swimmers - last?

What if instead of always assuming poor performances must a consequence of a deficiency in speed, strength, endurance or power - that the key to long term, sustainable, continuous improvement lay in other areas such as mental skills, technical abilities, strategies, effective goal-setting, recovery skills, sleep management, nutrition and relaxation techniques?

M.A.S.T.E.R. - A SIMPLE GUIDE TO FASTER NOT FITTER THINKING.

Here's a simple system to get you thinking differently about helping swimmers to improve and realize their peak performance potential. It's called M.A.S.T.E.R. (Mental skills, Attitude, Self-management, Technique, Environment, Racing Ability).

- **Mental skills:** e.g. concentration, focus, relaxation, mental toughness, confidence.
- **Attitude:** e.g. work ethic, positivity, commitment, dedication, perseverance, resilience, passion, drive, enthusiasm, courage.

- **Self-management skills:** e.g. sleep management, nutrition and hydration knowledge, travel-management skills, recovery skills.
- **Technique:** e.g. stroke technique, dives, starts, turns, finishes.
- **Environment:** e.g. parental support, team culture, coach-athlete relationship, team-dynamics and friendships within the team.
- **Racing ability:** e.g. strategies, tactics, pacing ability, managing multi-round racing, i.e. heats to semis to finals.

.....then after you've worked through this M.A.S.T.E.R. process, if the swimmer is still not improving, start thinking about adding more sessions and increasing the swimmer's physical load.

GREAT SOLUTION/WRONG PROBLEM.

Let's look at an example.

A swimmer in a 100 meter event, is in front and right on personal record time at the 50 meter turn. Then over the final 20-30 meters of the race, the swimmer slows down and fades to finish a disappointing sixth and in a relatively slow time. The obvious thing to surmise from this is "the swimmer is not fit enough to swim fast over a 100 and therefore, they need to get fitter by the addition of more training."

However, there's a great saying - "it's no good coming up with a great solution to the wrong problem."

There are hundreds of possible reasons why the swimmer slowed down over the final stages of their race including:

- **Mental skills:** when things started to hurt, they "tightened up", they stopped relaxing and this in turn caused a technique breakdown.
- **Attitude:** they had not been completing their speed work and other race pace intensity work in training at target race speed.
- **Self-management:** they had been up all night playing with their I-pad and other electronic devices. This caused them to sleep in, miss breakfast and get to the pool so late they didn't get to do a warm up.
- **Technique:** their turn, streamline and breathing control was poor under race conditions.
- **Environment:** they were having ongoing problems with several members of the team who isolate and ignore the swimmer at training and on race day. This isolation within the team is causing the swimmer considerable stress.
- **Racing ability:** they went out too fast due to a lack of pacing skills and an inability to control their excitement on race-day and as a result "blew-up" in the second lap.

Any one or all or a thousand other M.A.S.T.E.R. process reasons could explain the swimmer's poor performance. It's the

coach's job to work with the swimmer and try to figure out what went wrong, what can be improved and how to improve it.

Simply attributing the slow swim to insufficient "fitness" does not make any sense - and - more than that - by assuming that the only way to improve a swimmer's performance is to do more training you may be condemning them to failure and premature retirement from this wonderful sport.



[PHOTO COURTESY AZARIA BASILE]

SUMMARY

1. *Is fitness important? Absolutely. Incredibly. There's no doubt whatsoever that consistent, hard, challenging, demanding, physical training is crucial for swimming success.*
2. *However, equally important are all the "softer skills" - the less obvious abilities like stroke technique, turns, starts, finishes, mental skills, racing knowledge, tactical abilities, self-management.....all these things have a significant bearing on swimming performance.*
3. *Adding additional training sessions is a dead-end. If a ten-year isn't improving, will an additional three sessions a week help? What about five? Twenty six? Where does it end? If your "default" solution to every swimming performance problem is to increase the swimmer's physical load - **you'll end with a very tired, very burnt out and very retired swimmer by the time they hit their mid-teens.***

AND, AS ALWAYS: DON'T COUNT THE LAPS...MAKE EVERY LAP COUNT. ◀

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FIVE WAYS A TARGETED DRYLAND PROGRAM TRANSFERS TO THE POOL

BY BRAD JONES | PHOTOS PROVIDED BY BRAD JONES

Recently I attended a coaching conference where a lively discussion took place over the value of dryland training. The presenters, who were advocating for Ultra Short Race Pace Training (US-RPT), stated that science does not support the idea that a program transfers to the pool. They said that it was “a waste of time.”

Science, and its reductionist approach can be useful. The problem is that, with things like year round competitive swim training, science wants to make things black and white when there is way too much grey involved. Science has been distorted into a mythological boogiemer designed to frighten you into belief. If "Science" says so, then you should accept it (on faith).

In physical rehabilitation and sports training, the SAID Principle asserts that the human body adapts specifically to imposed demands. Given stressors on the human system, whether biomechanical or neurological, there will be a Specific Adaptation to Imposed Demands (SAID). In other words if you want to get good at “A” you need to do lots of “A.” This is why swimmers spend so much time in the pool. Pool time should always be the priority.

As a personal trainer and a Rolfer/Manual Therapist, I’ve worked with many high level athletes over the years, not just swimmers. If you see a skilled athlete, don’t be deceived by the appearance of success. Invisible to the untrained eye are a triage of compensations, which many trainers STRENGTHEN by making them overload their activity’s skills. They may improve performance temporarily but they equally reinforce dysfunction.

As both a swimmer and a coach, I have seen how a well-thought-out and targeted dryland program (I’m not talking about a cookie-cutter, bench-press and bicep-curl strength program) can help swimmers reach their goals and stay healthy.

Five ways a targeted dryland program will help swimmers:

[1] DECREASE IN INJURIES:

Balancing the rotator cuff muscles and strengthening the entire shoulder is incredibly important to reduce repetitive stress injuries and develop a stronger shoulder. A stronger more balanced shoulder will increase performance in the pool. If a high school aged swimmer is just swimming and doing things like stretch cords and swim bench (movements that mimic swimming), without strengthening some of the lesser used and weaker muscles in the shoulder, there will most likely be a price to be paid in the form of injury and an overall weaker shoulder. To become injury-resistant and ever improving, never train like the champion you admire. Any publicly disclosed program

of theirs will most likely not be something of value to you. I find that the real program, hidden in the closet, deals with their compensations and injuries and keeps them from falling apart. The real program is individualized and targeted at weakness.



TRX ROWS ARE A GREAT WAY TO BUILD POSTERIOR SHOULDER STRENGTH WHILE WORKING THE CORE.

[2] EXPLOSIVENESS:

From my experience, most swimmers have weak glutes. Increasing glute strength has led to more power and explosiveness in kicking, starts and turns.



TRX RUNNERS STRENGTHEN GLUTES AND HAMSTRINGS.

[3] CORE STRENGTH:

To move your body efficiently through the water, a coordinated movement of the arms and legs must occur. The key to this coordinated movement is a strong core, of which the muscles of the abdominal wall are a primary component. A dryland program with a focus on core strength through multiple planes of movement with arms

and legs performing different actions definitely transfers to the pool.



RUSSIAN TWISTS WITH A KETTLEBELL HELP BUILD ROTATIONAL CORE STRENGTH.

[4] BETTER BODY POSITION:

Good body position in the water is one of the most important ways to reduce resistance and drag. A good land based strength program where there is a strong focus on body position will help a swimmer increase proprioception, and find and maintain good body position in the water.



TRX ATOMIC PUSH UPS AND PLANKS ARE A TOTAL BODY WORKOUT WHILE FOCUSING ON BODY POSITION.

[5] CONFIDENCE:

Feeling stronger and looking stronger builds a swimmers confidence. Confidence and a sense of strength breeds success in and out of the pool.

I love science and it is important to be a critical thinker. As I sat there and listened to the presenters at the conference say that dryland was a waste of time and did not transfer to the pool, I knew from my own experience and anecdotal evidence that I did not agree. I also knew that there are plenty of scientific studies that conclude just the opposite of what we were being told. I am sure that there are outliers and high school swimmers training three months per year, for which the 'no dryland' approach has been successful. For the year round, high level club swimmer there is a long history of success with a well thought out and targeted dryland program. If your perspective does not consider the long history of thought in a field, you become merely a reaction to the prior generation, and doomed to become obsolete by the subsequent one. ◀

AN INTERVIEW WITH DR. ROD HAVRILUK

BY DR. JOHN HEIL

HOW DID YOU GET YOUR START IN SWIMMING?

I swam competitively since I was 7 years old, then through high school and college, and have continued with master's competition. My most recent race was an open water swim here in Florida.

WHAT HAS KEPT YOU IN THE POOL?

First of all, swimming keeps me healthy. But I also enjoy the positive social environment of my training group. I have been swimming with some of my group for decades!

WHAT DREW YOU TO SPORT SCIENCE INITIALLY?

I started coaching in the summers during college. After reading and applying Counsilman's Science of Swimming, I experienced for myself that science actually helped me swim faster. And I realized that science could also make me a better coach. After returning from a stint with the USMC, I decided to pursue a coaching career. I started graduate school in exercise physiology and worked as an assistant coach at FSU while completing my Master's. I earned my doctorate in biomechanics at Indiana, where I had the honor of working with and learning from Doc Counsilman. My research since those early days has made it clear that science is the best path to improving technique.

HOW DID YOU GET STARTED WITH YOUR SPORT SCIENCE CAREER?

After graduate school, I continued applying science to my coaching. Over time, I gradually transitioned into a full-time sport scientist, realizing I could have a greater impact that way. I moved forward with a combination of hands-on biomechanics consulting, swimming research, and technology development. This evolved into my personal business, Swimming Technology Research, which I continue to this day.

AS A SPORT SCIENTIST AND FORMER COACH, WHAT IS THE MAIN MESSAGE ABOUT SCIENCE YOU WOULD LIKE TO GET OUT TO COACHES?

Technique lies at the core of success. Proper technique helps reduce injury by minimizing the stress of repetitive motion, especially on shoulders. I have recently concluded that swimmers need to change the way they train, with a systemized approach to improving technique that includes components of deliberate practice.

WHAT DOES DELIBERATE PRACTICE MEAN AND WHAT IS ITS VALUE?

Fundamentally, it means concentrating on technique while training, actually striving for as close to 100% concentration as possible. There are about 8 components to deliberate practice which include, among others, carefully structured activities and frequent coach-swimmer communication.

HOW DOES THE TRAINING NEED TO BE DIFFERENT?

First and foremost, skill learning needs to be approached in a systematic fashion, which is consistent across all the coaches on a team. Second, the coach must balance training time allocated to conditioning and technique. An important but typically overlooked element of deliberate practice is solo practice. This helps a swimmer's concentration by limiting distractions common on the pool deck, and provides a swimmer with a better opportunity to give his or her full and undivided attention to technique.

WHAT IS THE MAIN MESSAGE ABOUT SPORT SCIENCE THAT YOU WOULD LIKE TO GET OUT TO COACHES?

First of all, I'd like to acknowledge that coaches have an incredibly difficult job! But I'd also like to say that sport science can make that job a little easier - - and certainly provide some additional tools and resources to help them succeed. Swimmers are the main beneficiaries when coaches are willing to check any conventional approach against the evidence that comes from the science. ◀

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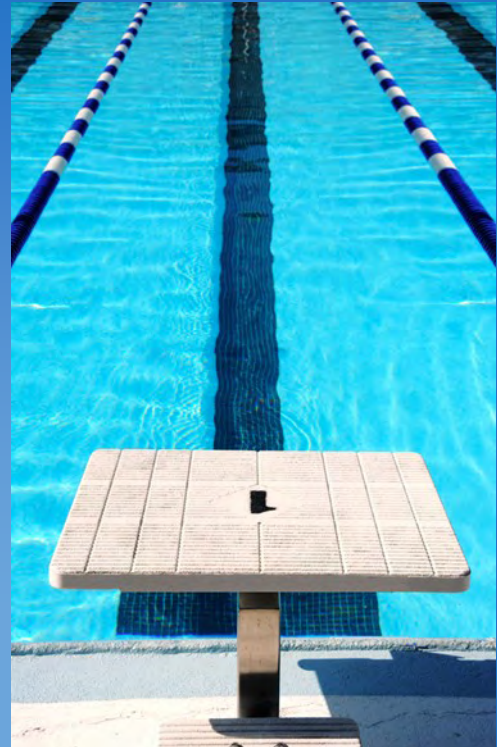
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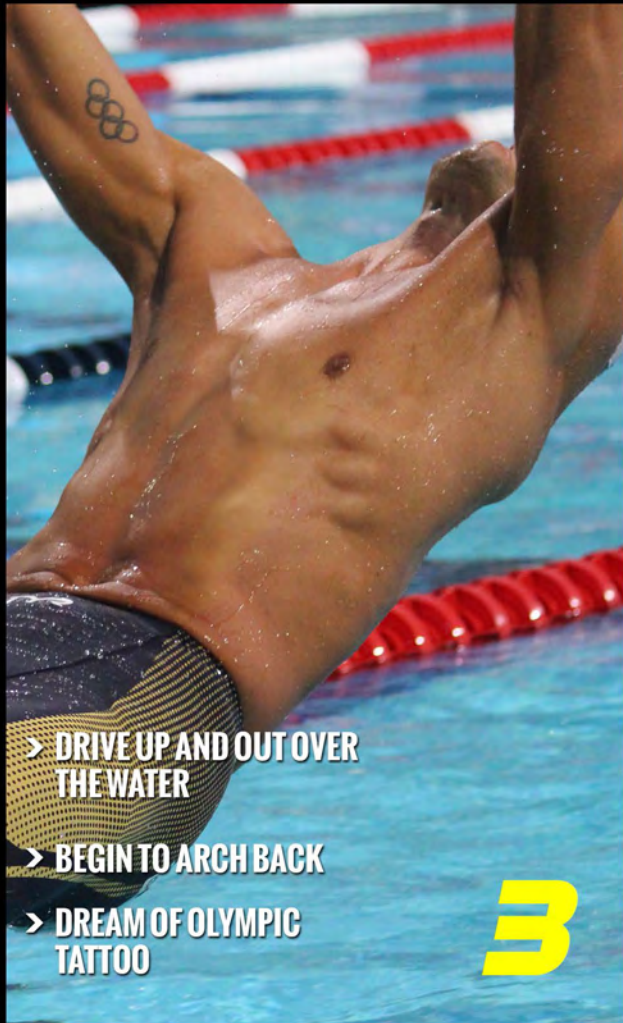
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Head Coach of Auburn University Swimming and Diving, Two-time Olympian, Bahamas national team coach for the 2012 London Olympic Games, Coach of former Auburn swimmer and 2008 Beijing Olympic Gold-Medalist, Cesar Cielo, 2009 World Championships Asst. Coach (Brazil) and 2008 Olympic Coach (Brazil), 2009 SEC and NCAA Co-Head Coach of the Year, and 2012 SEC Men's Coach of the Year, Brett Hawke, will be joined by a staff of highly qualified, accomplished, and enthusiastic coaches, counselors and collegiate swimmers to present the 2016 Auburn Swim Camps. Brett Hawke's coaching staff will combine the best of the Auburn Camp Tradition while incorporating the techniques used to create champions across the globe. This camp will feature technique instruction which will provide swimmers with the tools for success that can be applied to their training and development throughout their careers.

Auburn men and women have won a combined 13 NCAA Championship titles and a combined 23 SEC Championships! Spend a week at Auburn "Where Champions Train" and learn how to be the best that you can be at the 2016 Auburn Swim Camps.

All swimmers ages 9-18 are welcome.

Enrollment is limited and sessions do sell out, so don't delay. Register TODAY! *See display ad on page 38.*

Starts and Turns Elite Clinic

May 21 - May 22

5-Day Camps

Session I: May 29 - June 2

Session II: June 4 - June 8

BOLLES SCHOOL SWIM CAMP

Jon Sakovich, Director
7400 San Jose Blvd., Jacksonville FL, 32217
904-256-5216
sakovichj@bolles.org
www.Bollesswimming.org

Under the direction of Jon Sakovich, swim coach of The Bolles School swimming program, The Bolles School Swim Camps are developmental camps designed to provide quality instruction and training to swimmers of all abilities. All training and instruction will take place on The Bolles School's San Jose Campus, located on the St. Johns River. Campers will reside in The Bolles School's air conditioned dormitory rooms with 24-hour supervision and meals provided three times a day.

One week camps are intended for swimmers ages nine and older, representing all ability levels. The typical daily schedule will include 50-meter and 25-yard training, stroke technique and classroom lecture sessions, video taping, starts and turns, and a fun day-time activity. One week camps will be limited to 25 swimmers per week.

The elite camp is designed for experienced swimmers ages 13 years or older. Elite campers will train and compete with members of the Bolles Sharks swimming program including national high school champions, Florida high school state champions, high school All-Americans, and Olympians.

See display ad on page 37.

One Week Camps:

June 12-17, June 19-24

Elite Camps:

June 12 - July 23 (Up to Six Weeks)

FITTER AND FASTER

9055 Comprint Court, Suite 300
Gaithersburg, MD 20877
786-837-6880
www.fitterandfaster.com

Over 30 Olympians and elite level athlete clinicians.

Founded in 2009, The Fitter and Faster Swim Tour Presented by SwimOutlet.com is the only turn-key elite level swim clinic operation in the United States. We handle all of the work from the day we agree to produce a clinic or camp with "local hosts" until the event concludes and we send "Thank you for attending emails" and surveys to all the participants and volunteers.

When the Fitter and Faster Swim Tour was established in 2009 we produced less than 20 clinics. During the year 2015, we produced more than 170 sessions throughout the United States.

Producing clinics and camps that exceed the goals of our local hosts is very important to us. Fitter and Faster Swim Tour selects where we

produce clinics based on the shared objectives and relationships we establish with teams, LSCs, and leagues. We invest in every event that we produce and do our best to keep the financial investment on the part of the Event Host to a minimum.

Depending on the schedule of the athletes we work with, we are capable of producing more than ten clinics or camps anywhere in the United States on any weekend during the year. See display ad on page 33.

FUSION SWIM CAMPS

1700 Post Rd. D-5, Fairfield, CT 06824
800.944.7112
support@FusionSwimCamps.com
FusionSwimCamps.com

FAST-PACED. EXPLOSIVE. THRILLING. Fusion Camps offer young swimmers a terrific opportunity to improve their technical and competitive skills, make friends and have fun! Campers will improve individual stroke times, learn start and turn techniques, strength train and participate in timed trials daily. The Fusion Swim staff is comprised of talented and energetic NCAA coaches & Swimmers dedicated to the individual development of each camper.

The Fusion Swim Camps are designed to give young athletes the opportunity to work hard and improve in a fun, positive atmosphere!

NEW THIS SUMMER: 1 Day, Start & Turn Clinics working on the back & freestyle stroke starts, underwater kicking, flip & open turns. Film, Dry & technique training included. Boys and Girls Ages 8 - 18

June 19 - 23: Gregg Parini Swim Academy, Denison University (OH)

June 19 - 22: Brian Schrader Swim Camp, Denver University (CO)

HARTWICK COLLEGE COMPETITIVE SWIMMING AND DIVING CAMPS

Dale Rothenberger, Director
Hartwick College, Oneonta, NY 13820
607-431-4714 Fax: 607-431-4018
rothenberged@hartwick.edu

Celebrating Its 37th Year!

An extensive program for ages 8-18 (co-educational...resident and commuter campers) emphasizing improvement in the fundamental skills of competitive swimmers and divers. Morning, afternoon and evening sessions will balance time spending with water and dry-land training. Above and under-water filming and analysis. Lectures on nutrition, mental preparation, strength training, etc. Sprint/distance camp emphasizes conditioning and proper training of the major energy systems. Diving camp concentrates on technical improvement on 1- and 3-meter springboard diving. Stroke camp enables competitive swimmers to develop skills and techniques in starts, turns,

IM, and competitive strokes. Special two and three-week sessions are available. Director, Dale Rothenberger, Hartwick swimming and diving coach, will be joined by a staff of highly experienced coaches, counselors and guest clinicians (1:6 staff/camper ratio). Enrollment limit guarantees individual attention and frequent feedback.

July 3-8 Springboard Diving Camp
July 10-16, Stroke Technique Camp
**July 17-23, Stroke Technique/
Sprint/Distance Camps**
July 24-30, Stroke Technique Camp
Residential Camp: \$610 per week
Commuter Camp: \$505 per week
(Multiple-week discounts available)

LONGHORNS SWIM CAMP

Jon Alter, Director
The University of Texas
P.O. Box 7399, Austin, TX 78713-7399
512-475-8652 Fax: 512-232-1273
longhornswimcamp@athletics.utexas.edu
www.Longhornswimcamp.com

38 years of excellence! Headed by 2012 Olympic and Texas head men's coach Eddie Reese, 2013 World University Games and women's head coach Carol Capitani, and assistant coaches Kris Kubik and Roric Fink, the Longhorns Swim Camp is the most exciting camp in the country! Guest coaches and speakers include Olympians Brendan Hansen, Ian Crocker, Josh Davis, Colleen Lanne-Cox, Garrett Weber-Gale, Ricky Berens, and Whitney Hedgepeth. Open to male and female competitive swimmers, ages 8 to 18. Camp is held at the Jamail Texas Swimming Center on the University of Texas at Austin campus, home to 20 NCAA team champions. Facility includes a 50-meter by 25-yard pool, and 25-yard by 25-meter pool. Four training groups based on age and ability, with a 1:7 coach/swimmer ratio in technique sessions. Daily training includes challenging long-course sessions Monday-Friday mornings; technique sessions Monday - Thursday afternoons and evenings, with start/turn work included. Classroom sessions on technique and race strategies held. Underwater video of each camper analyzed by a coach. Daily social activities and field trips offered. Multiple-week stays include planned weekend activities with supervision. Experienced, mature, adult staff provide 24-hour supervision. Cost: Overnight Camp \$1025; Day Camp \$925. Complete camp information and online registration available at Longhornswimcamp.com. Per NCAA rules, sport camps and clinics conducted by The University of Texas are open to all entrants. Enrollment is limited only by age, grade level, gender, and capacity restrictions as specified by each camp. NCAA guidelines prohibit payment of camp expenses by a representative of The University of Texas' athletics interest. NCAA rules also prohibit free or reduced camp admission for prospects (9th grade and above).

MERCERSBURG SWIM CLINICS

Glenn Neufeld, Head Coach
Pete Williams, Associate Head Coach
Mercersburg Academy
300 East Seminary Street
Mercersburg, PA 17236
(717) 328-6225
summerprograms@mercersburg.edu
www.mercersburgsummer.com

Mercersburg Swim Clinics are dedicated to improving your technique and helping you develop as a swimmer both inside and outside of the pool. Mercersburg Academy's storied aquatics program has produced over 30 Olympians and brings a tradition of excellence to their summer program. The primary aim of Mercersburg Swim Clinics is to provide an experience that teaches swimmers the most innovative techniques available, while having fun. The philosophy is simple. Swimmers do not just compile distance, but rather work on improvements in starting, turning, and stroke techniques. Mercersburg Swim Clinics participants stay in Mercersburg Academy's state of the art residence halls that are recently renovated, air conditioned with carpeted hallways and have bathrooms on every hall with individual shower stalls. The swimmer to staff ratio is around 5 to 1. Mercersburg Academy's elite coaching staff and other successful coaches from colleges and club teams will instruct swimmers throughout the week. Counselors are generally current and former college swimmers or Mercersburg Academy graduates with swimming experience. Cost of camp; overnight camper: \$650; commuter camper: \$460. Mention this listing and use the promo code "SWIMMINGWORLD10" to receive a 10% discount! Team discounts are also available.

Session 1: June 19-23, 2016

Session 2: June 26-30, 2016

MICHIGAN SWIM CAMP

Jim Richardson, Director
8160 Valley View Drive, Ypsilanti, MI 48197
734-845-8596
Fax: 734-484-1222 / 734-763-6543
umswim1@gmail.com
www.michiganswimcamp.com or
www.camps.mgoblue.com

Four sessions open to any and all entrants, limited to 185 campers per session in Canham Natatorium at the University of Michigan. A staff of 50 and three instructional sessions per day, ensure the individual attention necessary for significant improvement. Coaches Mike Bottom, Dr. Josh White, Rick Bishop, Danielle Tansel, Mark Hill, Kurt Kirner, and Roger Karns are directly involved in coaching and teaching campers. All campers HD filmed daily and receive a written stroke analysis. Optional custom 4 view underwater video available for

a fee. Choose the Intensive Training Tract or the Technique Development Tract. World-class staff provides leadership and mentoring that encourage each swimmer to strive for excellence in and out of the pool. Cost: \$770/week includes instruction, swim cap, T-shirt, color photo, instructional printed materials, "goody bag", and room and board; \$620/week day camper fee includes all of the above (less room and board) and between-session supervision. See display ad on page 39.

**June 12-17, July 10-14,
July 31 – August 4, August 7-11**

NAVY SWIM CAMPS

Bill Roberts, Camp Director
Navy Swimming Camps 2016
566 Brownson RD, Annapolis, MD 21402
(410) 293-5834, (410) 293-3012
FAX: (410) 293-3811
navyswimmingcamp@usna.edu
www.navyswimmingcamp.com
www.navysports.com
Facebook search: Navy Swimming Camp

Expect direct results by being part of the 2016 Navy Swimming Camp this summer! Our principal goal is to provide you the very best in individual instruction, evaluation, camper experience, and safety/supervision. The purpose of our camp is to offer you a unique environment to learn and develop your competitive strokes including all related starts, turns and finishes. Navy Swimming Camp is a stroke-intensive camp. Swimming campers will receive individual attention. Additional training sessions are offered to all needing to maintain conditioning while at camp. Video analysis, dry land activities designed to improve individual fitness levels, performance, training, goal-setting, leadership presentations and the Severn River boat cruise are all part of the schedule for 2016.

Campers will learn, train and reside in an amazing and unique environment on the grounds of the United States Naval Academy. The Navy camp is led by an experienced camp staff while providing the very best in 24 hour supervision.

See www.navyswimmingcamp.com for greater detail including brochure, application, daily schedule and frequently asked questions. Cost for each camp: \$625/commuter camper (ages 8 – 18,) \$675/extended day camper (ages 8 – 18,) \$725/resident camper (ages 9 – 18.) All campers receive an exclusive NAVY swimming shirt & NAVY backstroke flag. Go Navy!
See display ad on page 39.

**June 14 – 18, Session I
June 20 – 24, Session II
Clinics: June 18 & 19**
(see website for 2016 clinic offerings)

NORTH BALTIMORE SWIM CAMP

NBAC is proud to announce it's tenth year of Competitive Swim Camp. In the last ten years, NBAC has hosted swimmers from 37 states and Puerto Rico and sixteen foreign countries. On the threshold of its 50th Competitive Season, NBAC is one of the most highly regarded swim programs in the country. NBAC is the only team in the country to be awarded GOLD MEDAL status every year since the recognition began in 2002. Producing national and international level athletes for almost half a century, NBAC's record of 37 Olympic Medals, 48 World Records and 3 Olympic Coaches is remarkable considering our team size of just under 200 swimmers. As we prepare for the Olympic Year 2016, we invite year round competitive swimmers ages 9-15 to join NBAC for a week and learn the "NBAC Way."

Sign-up ONLINE at www.nbac.net
See display ad on page 40.

**Day Camp \$775, Overnight \$950
June 20-24, June 27-July 1**

NORTHWESTERN UNIVERSITY WILDCAT SWIM CAMP

Wildcat Swim Camp
2311 Campus Dr., Evanston, IL 60208
847-491-4829
nuswimcamps@gmail.com
www.nuswimcamps.com
www.nusports.com

TECHNIQUE*FUN*VIDEO ANALYSIS

Don't miss out on this wonderful camp experience at Northwestern!

We provide a unique mix of training and technique work in a top tier aquatic center within our beachfront facility. Each practice is conducted by the entire NU coaching staff and several of our elite swimmers. We plan daily drills to work on strokes, starts, and turns. Along with the hard work, we plan daily activities away from the pool that make this a truly enjoyable experience. Our goal is to provide each swimmer with insights into the fabulous sport of swimming that help them to improve and enjoy their swimming experience. Contact us now! Please don't delay as camps fill up annually.

**June 12-16: Commuter Camp
June 21-25: Commuter and Resident Camp**

Check out camp listings on
www.swimmingworld.com/camps

OHIO STATE SWIMMING CAMPS

Bill Wadley, Camp Director
McCorkle Aquatic Pavilion
1847 Neil Avenue, Columbus, OH 43210
614-292-1542, 614-688-5736
Wadley.1@osu.edu
www.ohiostatebuckeyes.com

Train and learn from Ohio State Coaches Bill Wadley & Bill Dorenkott as they lead the Ohio State camps with the assistance of Dave Rollins and Jordan Wolfrum. The Ohio State staff will conduct the camp in a healthy, wholesome environment providing a positive experience for all campers. The camp is designed to focus on the technical aspects of starts, turns, and stroke technique in a fun and enjoyable environment that will prove beneficial for each camper. It is our plan to share the most up to date drills in a manner that is memorable for the athlete. Many of our campers have gone on to win State titles and even become National record holders and USA Olympians. Coaches Dorenkott and Wadley have both served on numerous USA National team staffs and each of them have produced Olympians and National record holders. The camp will take place in America's finest Aquatic center that hosted the NCAA's and Big Ten Championship in 2010.

Evening Camp, Technique and Training

May 18-21; May 26-29

Commuter Only Technique and Training

June 8-11

Commuter, Overnight

Technique and Training

June 14-18; June 21-25

PINE CREST SWIM CAMP

Coach Mariusz Podkoscielny, Camp Director
Pine Crest Swim Camp, 1501 N.E. 62nd Street
Fort Lauderdale, FL 33334-5116
(954) 492-4173
swimcamp@pinecrest.edu
www.pinecrestswimcamp.com
www.pinecrestswimming.com

Pine Crest Swim Camp gives swimmers the knowledge, training, background, technique, peer support and attitude that is needed to get to the next level. With top quality coaching, every camper will leave Pine Crest Swim Camp a better swimmer. At Pine Crest, we go a step beyond other camps and welcome overnight campers for full week-long stays (Sunday through Saturday) and day campers for Monday through Friday stays. The cost for our overnight campers is \$850 per week, which includes two workouts a day, three meals per day, daily activities, classroom sessions and 24-hour supervision. The cost for our daily campers is \$625 per week. The Camp Registration forms are available on the website and registration online is also available. Last year, we had swimmers from over 30 countries attend. Come to Pine

Crest Swim Camp and join our international atmosphere, athletes and coaches. Pine Crest Swim Camp: "The Camp that makes a difference." See display ad on page 41.

Overnight Camp:

June: 12-18, 19-25, 26- July 2

July: 3-9, 10-16, 17-23, 24- 30

Competitive Day Camp:

June: 13-17, 20-24, 27- July 1

July: 4-8, 11-15, 18-22, 25-29

SPEEDWEEKS BY SWIMMING TECHNOLOGY RESEARCH

Not all swim camps are created equal!

If you want to swim faster with less shoulder stress, STR's SpeedWeek is the only camp that actually delivers.

- Science-based instruction that makes an immediate difference
- Aquanex analysis to pinpoint the necessary technique adjustments
- Proven "deliberate practice" strategies to accelerate learning
- A format based on optimal learning, not more of the same, unproductive yardage

Dr. Rod Havriluk conducts each SpeedWeek. He was selected by *Swimming World* as one of 10 people having the greatest impact on swimming and is internationally-recognized for his approach to improving technique and preventing injury.

Guest experts speak on psychology, strength training, nutrition, physical therapy, and physiology. SpeedWeeks to insure maximum individual attention.

SPACE IS LIMITED! There are only two US-based camps scheduled for summer 2016.

Much more information is posted on the STR website - <https://swimmingtechnology.com/clinics-for-swimmers/swim-camps-and-clinics/speedweek-swim-camps/>

Register online -

[https://swimmingtechnology.com/shop/](https://swimmingtechnology.com/shop/kidd@swimmingtechnology.com)

Request additional information at kidd@swimmingtechnology.com.

Please note: Each SpeedWeek is limited to 12 swimmers who are serious about swimming faster. If you are looking for a "fun camp" to meet former Olympians, this camp will not be a good fit.

UTAH SWIM CAMPS

Jonas Persson, Camp Director
(801) 448-1478
jpersson@huntsman.utah.edu
www.UtahSwimCamps.com

University of Utah Swim Camps gives young athletes the tools needed to be successful. Camp Director and Olympian, Jonas Persson, and Head Coach Joe Dykstra, with their highly qualified staff, give personalized coaching, taking swimmers to the next level. Each day includes two water sessions focusing on all

strokes, turns, starts, with instant video analysis and one-on-one coaching. In addition, camp offers educational sessions, including dryland workouts, stretching routines, nutrition advice, and goal setting. Campers will also learn more about the psychology of training, mental aspect of the sport, and dynamic team building strategies. Open to any and all entrants, limited to age 8-18. See display ad on page 40.

June 6-10: Extended Day Camp

June 13-17: Overnight Camp*

July 5-9: Overnight Camp*

July 11-13: Day Camp

July 14-16: Start & Turn Day Camp

*Includes day and extended day options

WYOMING SWIM CAMP

Thomas Johnson, Head Coach and Director
Wyoming Swim Camp
Dept 3414, 1000 E. University Ave.
Laramie, WY 82071-3414
307-766-6265
tomj@uwyo.edu

Wyoming Head Swimming Coach Tom Johnson is hosting the 16th Wyoming Swim Camp this summer. Wyoming Swim Camp is a premier summer swimming experience and is proud to offer its' winning tradition to competitive swimmers. Coach Johnson, Coach David Denniston and Coach Kirk Ermels and the staff stresses the importance of swimming with outstanding stroke technique in a positive training environment.

The swim camps are held at the beautiful campus of the University of Wyoming located 135 miles north of Denver, Colorado, and is convenient to Denver International Airport as well as the Cheyenne, and Laramie, Wyoming Airports. The University of Wyoming offers an outstanding summer experience at 7220 feet, offering the opportunity of altitude training at the highest Division I school in the United States.

Wyoming Swim Camp is open to all, age nine years of age and older. Staff ratios generally range 1:8 coach to swimmer ratio. It is also one of the few camps that offer video analysis at NO additional charge. It is recommended that participants are competitive swimmers.

Coaches who are interested in accompanying their team Should contact Tom Johnson directly (307) 766-6265 or E-mail at tomj@uwyo.edu. To provide the very best camp experience each camp is limited to the first 60 swimmers for each week.

Online registration at the University of Wyoming's Swimming and Diving Team page

Start and Turn 1

June 3-5, 2016

Camp 1 and Intensive Camp 1

June 5-10, 2016

Camp 2 and Intensive Camp 2

June 12-17, 2016

Start and Turn Camp 2

June 17-19, 2016 ✨