

Volume 41 Number 1 April-June 2004

THE "HOW-TO" MAGAZINE FOR BETTER SWIMMING

SWIMMING

TECHNIQUE

YANA KLOCHKOVA
WORLD RECORD HOLDER
200 AND 400 IM

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Editor's NOTE

TECHNIQUE: EVERY DAY (A CHAT WITH COACH NINA KOZUCH)

By Phillip Whitten philw@swiminfo.com

(This is the fourth in a series of mini-interviews with some of the world's leading coaches—a new feature replacing the traditional “Editor’s Note.” This issue’s interview is with Coach Nina Kozuch of Ukraine, coach of world record holder and double Olympic gold medalist Yana Klochkova. This interview was undertaken with the assistance of Helen Chervitz.)

Swimming Technique: Coach Kozuch, how important is proper technique in your coaching program?

Coach Nina Kozuch: For me, proper technique is my top priority. How do you say it? Priority No. 1. I consider myself a technique coach above all, and I think other coaches see me the same way. Also nutrition and rehabilitation from injury are very important as well.

ST: What kinds of technique work do you do with your swimmers: from beginners through international level athletes such as Yana (Klochkova)?

Kozuch: Drills, drills, drills.

ST: How much technique work do you incorporate into workouts on a daily, weekly or monthly basis?

Kozuch: My swimmers are involved in technique work during every practice. Sometimes it’s longer, sometimes shorter, but technique is an element of every single practice session.

ST: Give us an example of one or two drills you particularly like to use.

Kozuch: OK. Examples include butterfly pull, breaststroke kick; freestyle pull, dolphin kick. I have created my own drills over the years. While I won’t tell you specifically what they are, I will tell you that I pay a lot of

attention to breathing in these drills—and in competition as well.

My swimmers are involved in technique work during every practice. Sometimes it’s longer, sometimes shorter, but technique is an element of every single practice session.

ST: What are Yana’s favorite drills?

Kozuch: There are no favorite drills. She works on areas that need improvement, so her focus changes from time to time. Each and every practice is a piece of work that is part of a larger whole.

ST: How much emphasis do you place upon technique during training?

Kozuch: My training plan for the year is based on cycles, but there is a constant emphasis on technique throughout the year. There is even a technique portion of my swimmers’ pre-race warm-up.

ST: As a coach, is there anything special you do to encourage perfect technique?

Kozuch: I don’t know if it’s special or unique, but I begin to work on a swimmer’s technique from early childhood. The kids in my program work exclusively on drills for a while. It’s only after they’ve perfected their skills in these technique drills that we move them to the next stage: putting the stroke together.

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Training for Gold

Yana Klochkova, the world's most dominant female individual medley swimmer, is intent on defending her Olympic titles in both IMs at Athens this summer.

By Helen Chervitz

For the past five years, Ukrainian Yana Klochkova, now 21, has been the world's most dominant female individual medley swimmer—the female equivalent of the USA's Michael Phelps, only she's been at the top longer.

Occasionally, Klochkova has lost a 200 meter IM race, though most often she wins the biggest races. But in the 400 meter IM—the sport's most grueling test of versatility, strength, endurance and strategic thinking—she has been nearly invincible.

Double Olympic champion in Sydney four years ago, double gold medalist last July at the FINA World Championships in Barcelona, Klochkova is focused like a laser beam on repeating her twin triumphs in Athens come August. The world record holder in the longer medley and the de facto record holder at the sprint distance (China's Wu Yanyan holds the official world record), she plans on putting up times that will stand for years to come.

Klochkova has also branched out to the distance freestyle at major events, winning silver in Sydney in the 800 meters (8:22.66) and gold in several major meets in the 400 meter free.

Just how dominant has Klochkova been? Since 1999, she has won:

• Olympic Games	2 gold, 1 silver
• World Championships	4 gold, 2 silver
• SC World Championships	9 gold, 2 silver
• European Championships	9 gold, 1 silver
• TOTAL	24 gold, 6 silver

She has also won several fistfuls of gold at the European Short Course Championships, World University Games (four gold in 2003) and the World Cup, as well as at other major international competitions.

For these achievements, Klochkova has thrice been named Ukraine's Athlete of the Year, most recently in 2003. Notably, she has achieved her unprecedented success despite being underpaid—even by Ukrainian standards—and despite having to contend with training in crumbling facilities lacking in basic equipment that American, Australian and western European swimmers take for granted.

For the past 15 years, Klochkova has been guided by the steady hand of veteran Ukrainian coach, Nina Kozuch, at the Dynamo Swim Club in Kharkov. A swim coach for more than 40 years, Kozuch has coached several other world-class swimmers besides Klochkova. Now, ten other swimmers—mostly 13-year-olds—train daily under her motherly-but-no-nonsense guidance.

Kozuch says she first began coaching Yana in 1989 when she was 7 or 8 years old.

"She had just moved with her family from the port city of Simferopol to Kharkov, where my husband (also a top Ukrainian coach) and I had our swimming school," she says.

"Actually, it was my husband, Oleksander Kozuch, who first pointed Yana out to me. She had come to the pool with a group of youngsters for tryouts. Oleksander commented to me on how naturally fluid her strokes looked for an untrained youngster.

"She definitely seemed promising, so I spoke with her parents, took her on as a student, and she's been with me ever since."

What Makes Yana Swim?

"Nobody is a born swimmer," Coach Kozuch maintains. "You can be born with the potential to display outstanding talent, but unless that talent is developed, it

remains unrealized—and is just potential.

"Only self-discipline, perseverance and the willingness to work hard can make a person stand out from the crowd and achieve remarkable results. Undoubtedly, Yana was born with outstanding potential for swimming. But she is also a very hard worker. She is goal-minded, determined and capable of living the life of a world-class athlete.

"On top of it all, Yana is a sensitive, responsible person and has a wonderful sense of humor."

Clearly, Coach Kozuch has a profound respect for her star athlete. And, not surprisingly, that respect is reciprocated.

Yana's 2004 Training Plan

Coach Kozuch's training philosophy for Klochkova can be summed up very simply: "Don't mess with success." What worked in 2000 (and since), Kozuch maintains, will work again in 2004.

Klochkova's daily workout consists of two sessions, each 6,000 meters in the water, punctuated by a 90-minute nap between training sessions. Every workout includes a heavy dose of technique work, including a variety of kicking and pulling drills, plus some additional drills Coach Kozuch prefers to keep secret.

In addition, she does an hour to an hour-and-15 minutes of dryland exercises every day. In the spring, she does a lot of running. Sunday is a day off, and on Thursday, there is only one practice. Most of the dryland training emphasizes flexibility, with the goal to make the transition that incorporates her gains on the land into her stroke in the water.

One month a year, Yana has a break from swimming. "During that time, we try to be outside as much as possible," says Coach Kozuch. "For instance, last year we



“Only self-discipline, perseverance and the willingness to work hard can make a person stand out from the crowd and achieve remarkable results.”

went to Switzerland and did a lot of hiking.”

That emphasis on being outdoors carries over into Klochkova’s training. “Yana was born in the seaport of Simferopol, so she likes to swim in the sea. We try to swim in the natural waters as much as possible, using every opportunity. Personally, I have no doubts that sea water is much healthier than a chlorinated pool.

“We also pay a lot of attention to nutrition and rehabilitation, so Yana can stay in good health and maintain her shape, simply because her results won’t be successful if health issues begin to arise.”

Klochkova’s pre-race warm-up typically totals about 1,200 meters, depending on the level of competition: generally speaking, the tougher the competition, the longer the warm-up. She begins with 200 to 400 meters easy freestyle, then follows with “a lot of technical drills with an emphasis on breathing and optimizing her feel for the water.” She finishes it with a set of sprints, usually either 25 or 50 meters.

Expectations

Coach Kozuch does not plan to taper Klochkova for the Ukrainian Olympic Trials, focusing instead on the Olympic

Games in Athens.

“I think it’s more difficult to defend the Olympic title than to win it (for the first time). Nevertheless, we believe she can win the gold in the 200 IM as well as the 400 IM, and she can lower the world records in both events.”

Even the 200 IM, where the record by China’s Wu Yanyan is widely believed to have been chemically-assisted?

“Absolutely,” claims Kozuch.

Klochkova sees her major competition coming from Hungary’s fast-rising Eva Risztov, with whom she already has waged several classic battles, plus Romanian veteran Beatrice Coadă-Caslaru. That may reflect a European bias. Last time around in Sydney, her major competition in the 400 IM came from Japan’s relatively unknown Yasuko Tajima.

The United States may have a contender in 14-year-old phenom Katie Hoff, while the 200 could bring challenges from the likes of the USA’s Amanda Beard and Australia’s Alice Mills, among others.

Coach Kozuch is unfazed. “I believe Yana can beat the world records,” she asserts.

Why? “Yana is extremely diligent. She is a great competitor with incredible will power and the ability to concentrate on the race while showing no fear.

“In any event, it will take a world record to win in Athens. Whoever breaks the world record will take home the gold.”

The Future

Coach Kozuch is not looking beyond Athens for her star pupil.

“Yana is not a machine,” she says, “and even machines don’t last forever. She is a gorgeous young girl who is sacrificing a lot of things that other girls her age have been enjoying.

“There are, of course, no regrets. In the nature of things, her training and competing inevitably will come to an end sometime. We don’t know when that will be, but whenever it is, Yana will have a whole life ahead of her.”

As for Coach Kozuch?

“I’ll just keep working,” she says, laughing.

Helen Chervitz, a former Ukrainian junior national champion in the freestyle sprints, now lives in the United States.

What It Takes to Be a World-Class Medley Swimmer

The IM—and, in particular, the 400 IM—has progressed to the point where you need to be technically proficient in all four strokes, have superb endurance, great speed and power, and the ability to think strategically.

By Bob Bowman



Photo by Dave Black

If you want to be an elite, world-class 400 IMer—and especially if you want to be a world record holder—at the very least you need to be a U.S. national finalist in all four strokes.

There are four major components that go into developing a world-class individual medley swimmer:

- Technical Proficiency
- Endurance Capability
- Speed and Power
- Strategic Thinking

If Michael Phelps takes the fly out in 55 seconds and follows with a minute for the backstroke, you don't want him just swimming through the breaststroke, then bringing it home. You can't get away with that any longer. If you try, someone from Hungary or Russia or wherever will

eat you up on your weak strokes and beat you to the wall.

Technical Proficiency. If you want to be an elite, world-class 400 IMer—and especially if you want to be a world record holder—at the very least you need to be a U.S. national finalist in all four strokes. Michael Phelps has won U.S. national titles in the 200 fly, where he is the world record holder; the 200 back, where he is the second-fastest all-time; and the 200 free, in which he holds the American record. The only stroke in which he has not been a national finalist is the breast-

stroke, but that's because he hasn't entered the 200 breast at a U.S. nationals yet. When he does, I believe he'll be fast enough to be a finalist.

To be world-class in the IM, you must be able to do all the strokes at a very sophisticated technical level. In essence, you must also be a 200-meter stroke specialist. That's what separates the good medley swimmers from the great ones. It used to be—before the 400 medley became so competitive—that an elite 400 IMer was either a breaststroker with endurance or a miler and, in either case, a training animal. No longer. Now you have to be at the elite level in all four strokes—and you *still* have to be a training animal.

Endurance Capability. Success in every swimming event is predicated upon having the aerobic background that gives a swimmer great endurance capability. But endurance capability is not only the framework for success in a particular event. It is also what allows a swimmer to compete in several events and be successful in all of them.

This, I believe, is where some people misunderstand what training is all about. Yes, you want to have specificity of training. But the training delivers more than just the specific training stimulus. You also want a swimmer to have multi-event capability. That can't happen unless he or she has extraordinary endurance built upon a foundation of aerobic conditioning.

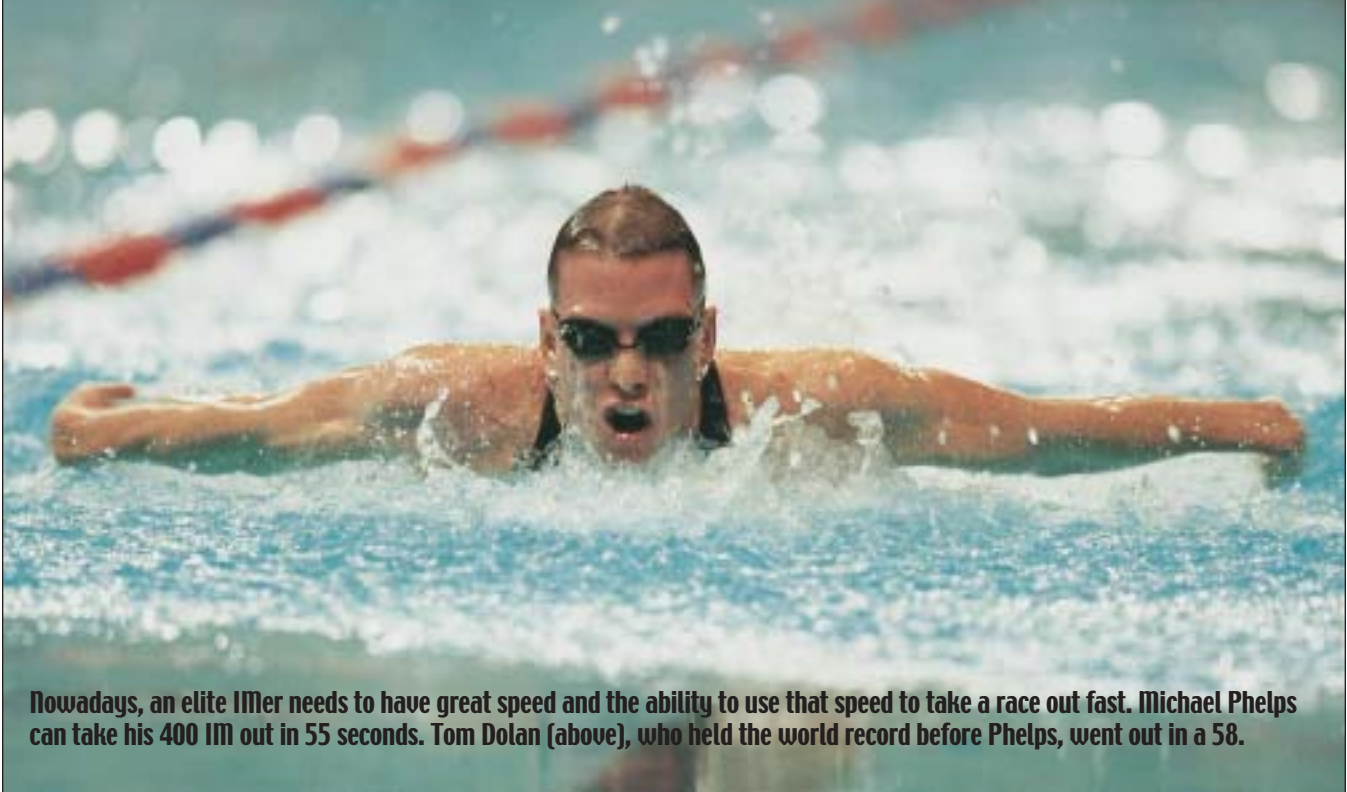


Photo by Peter H. Bick

Nowadays, an elite IMer needs to have great speed and the ability to use that speed to take a race out fast. Michael Phelps can take his 400 IM out in 55 seconds. Tom Dolan (above), who held the world record before Phelps, went out in a 58.

Sometimes I am asked, “Does Michael really need to do 10 x 800 in practice to swim a great 400 IM?” The answer is: *not specifically for the 400 IM.*

But if he wants to swim the 200 back, then come back half an hour later and do the 200 fly, then come back again in 45 minutes and win the 400 IM—yes, he *does* need to swim ten 800s.

Speed and Power. Nowadays, an elite IMer needs to have great speed and the ability to use that speed to take a race out fast. Michael can take his 400 IM out in 55 seconds. Tom Dolan, who held the world record before Michael, could only go out in a 58. You can’t win at the international level unless you have great speed and power to go along with technical proficiency and tremendous endurance capability.

Strategic Thinking. Without question, the 400 IM demands more strategic thinking than any other event. A world-class IMer needs to know the five strokes—I count underwater skills as a separate stroke—how to use them to maximum effect and how they fit together, especially the transition from breaststroke to freestyle.

Training Technical Proficiency

The way you go about gaining technical proficiency is by mastering one thing at a time. There may be five things wrong with a swimmer’s technique, but

you can’t change your whole laundry list of five things at once. You need to list the changes to be made, prioritize them, work on the first item on your list until it has been mastered, switch to the second item and master it, do the same with the third, and so on. After mastering any particular item on the list, you may want to switch and go back to a previous skill.

Lay a Foundation of Skills. We like to lay a foundation of basic skills for all our swimmers by emphasizing all five strokes with individual days of training. For each weekly cycle, we’ll have one day where we’ll focus primarily on backstroke, another will be a big breaststroke day, a primary stroke day, an IM day and another technique day. Flyers can do butterfly on the primary stroke day, and we dole out small doses of fly on all the other days.

Isolate Skills and Prioritize. I like to prioritize and then work on my highest priorities first. In Fort Lauderdale in 2002, when Michael went into that final turn of the 400 IM behind Erik Vendt, then came off that wall with a full 15 meters of underwater dolphin kicking, that was no accident or spur-of-the-moment decision. That strategic move came as a product of six months of preparation.

Building Endurance Capability

There are several different types of endurance, and to be a world-class med-

ley swimmer, you have to work on all of them.

Central endurance, or *cardiovascular* endurance, of course, is essential to all swimming events except the 50s. Fortunately, the body can become aerobically fit in only about six weeks.

In contrast, *peripheral endurance*, or *muscular* endurance, takes much longer to develop, about three to six months. Here you are training the neuromuscular system to do things repetitively, and that process takes a lot of repetition. Needless to say, it’s essential that the repetition be done with the proper movement pattern.

General and specific endurance are the two remaining types of endurance needed to produce an athlete who is able to handle the workload and the physical and mental stresses of training. General endurance results in a better athlete, one who can recover faster from all stresses and can handle a higher training volume. Specific endurance, not surprisingly, refers to the specific skill, itself—being able to finish a 200 fly or 200 breast, for example. These are two different types of endurance, but a world-class IMer must have both, and both types are major components of our training.

Speed and Power

We focus on *basic (technical) speed*—that is, high speed, swum *faster* than race pace and with perfect technique—at the end of workout when the swimmers are

What It Takes to Be a World-Class Medley Swimmer

tired. What we do are short sprints—25, 20 or 12-1/2 yards or meters—with plenty of rest. These are done at the end of workout mainly because the body is already under a significant amount of stress. When we're swimming long course, we might typically go a 25-meter sprint at faster than race pace, then swim easy to the end of the pool. These sprints allow the body, while under a load of fatigue, to swim faster than race pace.

We also do race-pace sprints. The purpose of these sprints is to condition the stroke to respond appropriately to the race feel and conditions. They simulate in the workout the stress of competition while maintaining optimum technique.

While building speed and power, an elite IMer must also *refine the technical details* of his or her race, including starts, turns and underwater swimming. Don't neglect stroke rate and distance-per-cycle, which has a lot to do with race-pace training because it is literally building the stroke the swimmer will use in the race, then conditioning that stroke to respond. If the swimmer does that on a regular basis, his body will respond automatically when faced with virtually any challenge that might arise in competition.

Strategic Thinking

In training world-class medley swimmers, I believe you go with your strengths before you try to minimize any weaknesses. It's a fundamental principle: *always go with your strengths first*. That way you won't lose sight of developing your strengths because you are trying to improve your weaknesses.

The opportunities for improvement are important to a swimmer's success. I call this kind of improvement "raising the basement." I want your worst technical skill to be better than it was before. I want your baseline technical ability, your baseline endurance capability, your baseline speed and strength to increase progressively over time because then your peak level will also increase.

These two things—improvements in baseline and peak levels—don't happen independently of each other. So, as you're going with your strengths, you are also minimizing your weaknesses.

Stroke Modulation. In thinking strategically about an event or a race, a swimmer needs to analyze his or her strengths and make appropriate choices. Different races should be swum differently. We call this stroke modulation. For example, in the backstroke portion of the 400 IM, a swimmer typically will emphasize a faster arm tempo, de-emphasizing the intensity of the kick so he can have the legs available for the breaststroke.

Here's another example of stroke modulation:

Very strong flyers can swim the butterfly portion of the race more relaxed simply because they are able to swim easier than their competition at a faster speed. This is one of Michael's great strengths in the 400 IM—he can swim a 55 for the opening 100 meters of fly, and it will be easy and relaxed for him. That gives him a tremendous advantage over his competition, who either must struggle to try and keep up, or concede several seconds to Michael in the first quarter of the race—seconds that will not be easy to make up.

In swimming the 200 IM, use more legs and underwater on backstroke than in the 400. Maximize what you get from those underwater 15 meters of dolphin kick.



Momentum Changers. Momentum changers are key points in a race where you can take advantage of an opportunity to make a move or take the lead and change the complexion of that race. It could be during the underwater, or at a certain turn, or at a specific spot in a lap.

The most important potential momentum changer is the transition from breaststroke to freestyle. The speed difference between the swimmer swimming freestyle and the other guy doing breaststroke creates a deficit that simply can't be made up.

The 400 IM vs. the 200 IM

Normally, 400 IMers are good 1500 meter swimmers. Tom Dolan and Janet Evans are excellent examples. In contrast, 200 IMers are often outstanding 200 freestylers. Massi Rosolino and Attila Czene illustrate that tendency.

Swimmers who swim both races well always train and race down from the 400 to the 200. Think of Michael Phelps, Tracy Caulkins, Tamas Darnyi and Yana Klochkova. I can't think of anyone who was a successful world-class 200 IMer who then added the 400.

There are identifiable patterns of related events for both IMs. On the one hand, 400 IMers tend to be good at the mile and 200 meter stroke events. Dolan was an outstanding 1500 meter swimmer who was also world-class in the 200 back, breast and free. On the other hand, 200 IMers most often are good 200 freestylers and 100-meter stroke swimmers. Attila Czene, for example, was world-class in the 100 and 200 free as well as the 100 back.

400 IM

The following are my admittedly subjective feelings about how best to race both medley events.

Here are what I believe to be the keys to swimming the 400 IM:

- *Butterfly.* The first 50 meters must be relaxed. The second 50 is often the most important lap of the race. This is the best opportunity to open up and hurt your competitors and gain the most advantage.



The pullouts are critical to establishing the rhythm of the breaststroke. You've got to be carrying momentum and speed from the underwater pullout to the surface, particularly in the 400 IM, where you're under so much stress.

Photo by Michael Aron

Almost everyone overswims the first 50 or is impatient while swimming it. Michael Phelps' 400 individual medley really took off only after he learned to relax on the first 50. Once he did that, he could make his move on the second 50, building momentum.

The others swimmers might have committed the strategic error of pressing too hard on that first 50, then coming off that first turn, thinking, "Man, this hurts a little...and I've got 350 meters to go." Meanwhile, Michael is building momentum.

- *Backstroke.* Use more arm tempo and lighter legs.

- *Breaststroke.* The pullouts are critical to establishing the rhythm of the stroke. You've got to be carrying momentum and speed from the underwater pullout to the surface, particularly in the 400 IM, where you're under so much stress. You don't want a short pullout, then just pop up, have no momentum and have to start from scratch. You've got to carry that speed off the wall.

- *Freestyle.* As I mentioned earlier, the breast-to-free transition is a very big opportunity. If you've made the turn and are swimming freestyle while everyone else is still doing breaststroke, they can't make up the advantage and will never be able to catch you. Essentially, the race is over.

Still, the final 100 meters should be

swum strategically. Build the first 50 meters; then on the final 50, throw your kick into it. Kill your legs as you head for the touch pads.

If you decide to go for that long underwater dolphin off the final turn, you've got to train for it. As I wrote earlier, when Michael used the underwater dolphin to overtake Erik Vendt at the 2002 Summer Nationals, we'd been training it every day for six months. That turned out to be Michael's margin of victory as both guys went under Tom Dolan's world record. You've got to train it every day.

200 IM

The 200 IM is a very different race. Here are the keys to swimming it:

- *Butterfly.* Try to maximize your start and use those body dolphin movements to carry your momentum from the start and build speed.

- *Backstroke.* Use more legs and underwater than in the 400. Again, maximize what you get from those underwater 15 meters of dolphin kick.

- *Breaststroke.* Here the breaststroke is much more power- and more tempo-oriented than in the 400. That's the reason why some mediocre breaststrokers can get by in the 200 IM, but not the 400.

- *Freestyle.* Here, as in the 400 IM, build off the breast-to-free transition, and kick hard.

What It Takes to Be a World-Class Medley Swimmer

Key Elements of the NBAC Training Program

The guiding principles of the North Baltimore Aquatic Club (NBAC) training program are:

- Attitude Development
- Incremental Technical Improvement
- Continuous Preparation
- Condition the Stroke

Attitude Development

The single most important thing we demand of our athletes is that they approach what they are doing with the proper attitude: is it an ordeal or an adventure? We try to tell them what the proper attitude is, but ultimately it's up to each individual athlete.

On "adventure" days, when Michael comes to the pool, I can see it immediately in his eyes, his demeanor. On those days, I could drop him off at the lake, have him swim on his own for two hours, and he would still get in a world-class workout. But on "ordeal" days, he could have several coaches and doctors standing over him the entire time, and it wouldn't make a difference.

If you don't have the proper attitude, you're not going to accomplish anything worthwhile.

Incremental Technical Improvement

We view the development of a world-class swimmer as a long-term operation. It's an operation in which years of small changes eventually add up to major principles. At NBAC, a Michael Phelps or a Katie Hoff is four to six years in the making.

Continuous Preparation

Continuous preparation is the key to continuous improvement. The NBAC program never shuts down. *Never!* Our feeling is the more time a swimmer spends in that foreign medium—the water—the better he or she will be. It enhances feel for the water. You can't get that when you're constantly interrupting the program. So we don't have a break between short course and long course seasons, and we don't break at the end of summer.



The final 100 meters of the 400 IM should be swum strategically. Build the first 50 meters; then on the final 50, throw your kick into it. Kill your legs as you head for the touch pads.

Swimmers may take a few days off at the end of a season, but these breaks are set up on an individual basis.

We also train seven days a week—not five or six. In a typical week, we'll have doubles on Monday, Wednesday and Friday, and one practice on Tuesday, Thursday, Saturday and Sunday. When there's no school, we usually make Tuesday a doubles day.

Condition the Stroke

Conditioning the stroke is a very important concept I learned from (NBAC Head Coach) Murray Stephens. It merges ideas from exercise physiology, biomechanics and other scientific perspectives to have the swimmer's strokes develop an integrated, conditioned response to the demands of a competitive environment.


A biomechanist looks at arms and legs, levers and vectors, and they equal a swimmer. A physiologist looks at the heart, lungs and blood and, to him, they equal a swimmer. These are valuable perspectives, but when you're doing a training set, you're trying to condition the stroke to respond as you'd like it to do in a race. You want an integrated response.

We don't look at training and say, on a particular day, that we're focusing on EN1 and the only thing that matters is keeping the swimmer's heart rate at 150 or 140. That's not enough. There are also neuromuscular, technique and psychological factors to consider. We try to tie all these factors together in a comprehensive package of development.

Dryland Training

Our attitude toward dryland training is that it must enhance performance, not destroy it. The philosophy is: the best way to swim fast in competition is to swim fast in practice.

Consequently, our dryland training must complement what is going on in the water, and it must pass the test of helping the athlete to swim faster in practice. That's why we never use weights, which are stressful, tear the athlete down and take 48 hours for recovery.

All of our dryland training is done directly after swimming. We usually go for 30-60 minutes every day but Sunday, and use medicine balls, the VASA Trainer, Total Gym, and so on. 

Bob Bowman is the senior coach at the North Baltimore Aquatic Club in Maryland and has trained Michael Phelps for the last seven years.

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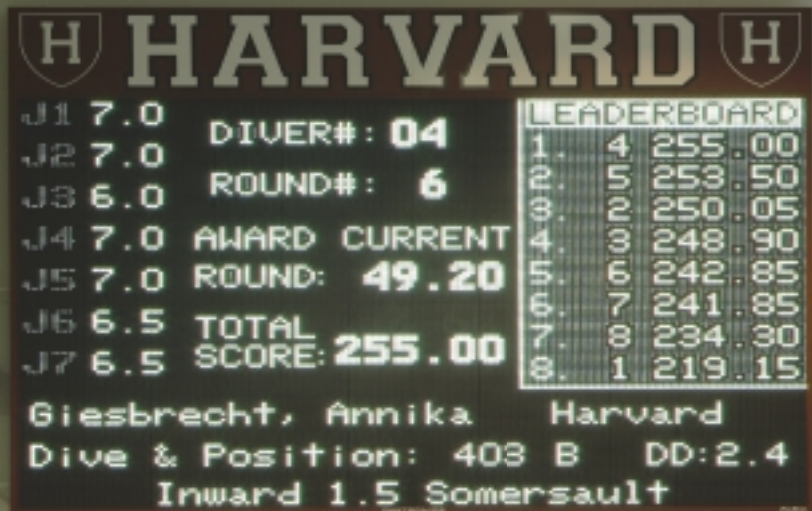
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The LONG and SHORT of It

Coaches Bob Gillett and Dick Shoulberg explain how they train their swimmers for long course competition by using short course pools.

By Ed Odeven

America is one of the few places in the world where the metric system is not the prevailing measuring stick for most things. (Think heights, weights and distances. For instance, without the aid of a conversion chart, how many of you can instantly calculate the height in centimeters and the weight in grams of that ice cream sundae you just ate? Me neither.)

Which is why some pools are designed with yardage in mind. Many pools in the United Kingdom and United States are 25 yards in length. These, of course, are referred to as short course pools.

But, as you know, the international swimming community prefers to use the metric system; world records are only recognized if the swimmer's feat is accomplished in a 25- or 50-meter pool. Olympic-size swimming pools, also called long course pools, measure 50 meters long.

Globally, swimmers know all about the measurements of the pools and train accordingly, many in long course pools, some in short course pools, others in both.

Domestically, two of the USA's most prominent and successful long-time coaches, Bob Gillett of the Arizona Sports Ranch/AFOX in Phoenix, Ariz., and Dick Shoulberg of Germantown (Pa.) Academy, tailor their swimmers' long course workouts by using short course pools.

"My athletes have to be prepared to swim in a long course pool even though 95 percent of their training during the school year is done in a short course pool," says Shoulberg.

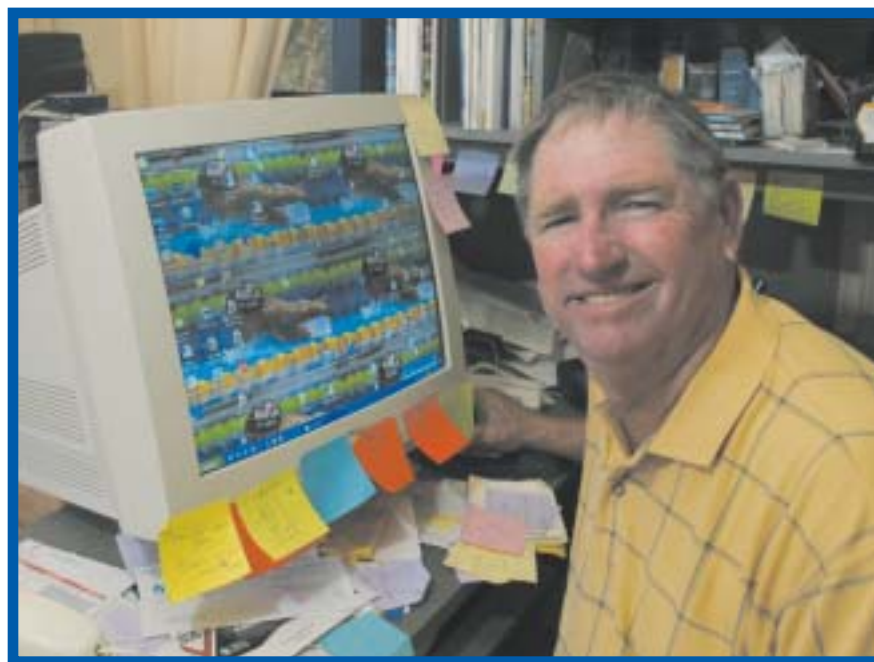


Photo by Michael Aron

Bob Gillett maintains that swimmers must be willing to train from 50 to 60 kilometers per week to become a national level swimmer in the U.S. For distance swimmers, he suggests 80 to 110K per week. "If you are going to train in short course for long course, you have to train big yardage."

Adds Gillett, "I believe that the best way to train for long course competition is to train long course. But if you are faced with the use of only a short course facility for your training, you will need to be creative and willing to adapt your training sets."

Which triggers the following question: What methods and/or theories have Shoulberg and Gillett used over the years to develop their swimmers' long course training for a short course facility?

It all starts with the basics, according to Shoulberg. His approach relies on getting his swimmers to be versatile,

all-around competitors, getting them to master the bread-and-butter event of swimming: the 400 meter individual medley.

The approach is working.

In five of the last six U.S. Olympics Trials, a Germantown Academy swimmer has competed in the 400 IM and other events. Year in and year out, Shoulberg's pupils form a pipeline to the NCAA; Germantown swimmers routinely receive athletic scholarships to Division I institutions. Shoulberg, who has coached for 49 years—the last 35 at Germantown—estimates that number is around 10 to 15 per year.

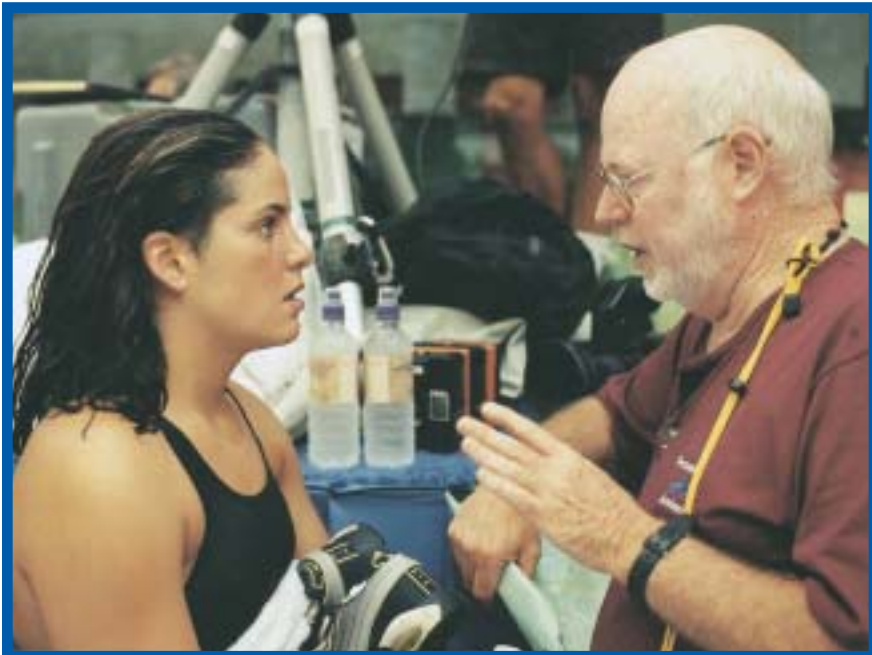


Photo by Peter H. Bick

Dick Shoulberg (right) believes his swimmers should master the bread-and-butter event of swimming, the 400 meter IM. Maddy Crippen (left), was a prime example of Shoulberg's philosophy—she finished sixth in the 400 IM at the 2000 Olympics.

“Each athlete from age group to senior swimmers works on all four strokes each and every practice. During certain times of the season, I overload their prime stroke but maintain the fitness-based IM training,” Shoulberg says. “By working on all four strokes each day, you outsmart fatigue to the muscle groups and you mentally challenge the athlete daily.

“Fit athletes who are mentally tough find ways to improve when they need to improve.”

A Valuable Lesson

Throughout the 1970s, Gillett's swimmers at the Arizona Sports Ranch only trained in a 25-meter short course pool. After what Gillett characterized as a very good year in 1979, during the short course season he began pondering the options for the next year. And he changed the routine—one that worked quite successfully—that he and his swimmers had gotten acclimated to.

Big mistake.

“The hours were terrible, the travel arrangements of kids changed, meal times changed, we had to deal with

uncooperative lifeguards and transients in the adjacent park and we lost some of our total yardage—but I stuck it out for the whole summer,” Gillett recalls. “It was one of our worst summers in that period of time. The next year we went back to the good old short course meters pool, and it looked a whole lot better with all of its advantages.”

Indeed, venues are not the most important aspect of a training regimen; results are. And what it essentially comes down to is this: speed.

To develop the ability to swim with speed consistently and properly, Gillett and Shoulberg, like many of their coaching counterparts, emphasize the importance of long, quality workouts.

“Big yardage is important, especially during the important developmental years,” Gillett maintains. “I am often asked by young swimmers about how much yardage is necessary. They are after a simplistic and definitive answer. I tell them that they must be willing to train from 50 to 60 kilometers per week to become a national level swimmer in the U.S. I think this yardage is a threshold level.

“If you are planning on a program with less than this, then you are going to have a very low probability of consistently developing swimmers to the national level in this country. If you are a distance swimmer, look at 80 to 110K per week. If you are going to train in short course for long course, you have to train big yardage.”

That said, it helps to remember that countless hours of hard-core training prepare elite-level swimmers to have the endurance to turn it up a notch at the end of a race.

Or as Gillett states, “After you get to this level, you have to spend 90 percent of (your) effort, focus and time for the last part of the race.”

And how should swimmers train for the always-critical final stage of a long course race?

One successful formula involves the skillful alternation between aerobic and anaerobic training. “You need to develop that ability to sustain cycle length and sustain tempo during the last part of the race,” Gillett continues. “The psychology of mental toughness also becomes an important variable at the end of a long course race.”

Monitoring one's pulse is an effective tool in testing the results of training. Misty Hyman, a Gillett pupil who is one of the USA's most highly decorated female swimmers—including an Olympic gold medal in the 200 meter fly at Sydney in 2000—has had her pulse monitored for some time now with the results displayed on a pulse-rate curve.

The all-out effort given by Hyman, Gillett recalls, resulted in her pulse shooting up to 180 beats per minute, 20 seconds into her 36-minute workout. And her heart would beat that fast for the remainder of a workout. It became helpful for Hyman to drop the pulse a bit, say, around the 150-beats-a-minute range for the freestyle portion of her workout.

How is this done? At the Arizona Sports Ranch, the following are sets used to take advantage of aerobic-anaerobic switching:

The LONG and SHORT of It

- 1 x 3,000 freestyle with every fourth length on stroke. Long stroke on free, then blast your stroke (back, breast or fly) with the power tempo.
- 10 x 100 at 1:30. Power tempo the first and fourth 25s on stroke, swim the middle two 25s with lower intensity freestyle.
- 1 x 1,000 with every fourth length on power tempo on stroke.
- 10 x 100 at 1:30. Last length sprint kick.

“The idea is to contribute to the development of maximum cardiac output,” Gillett says. “The heart developing stronger stroke volume during the more aerobic part of the swim, and then applying it with a greater heart rate, results in higher levels of cardiac output.”

A strong heart is the backbone of a strong racer. Still, it never hurts to push a little more.

“If you are training to swim 1:58 in the 200 free, it seems appropriate to train your system for the 1:58 effort, not 2:17 or 2:24,” Gillett says, speaking of time-specific training. “Actually, we

always have felt you should train a little under your goal time, say 1:55 in this example. This is based on the idea that you should train the system that *could* get you there, then let the great athlete maximize for that last bit with great ability and/or desire.”

“We will go backwards as a nation if we make short course swimming a high priority because I have proven to myself and my athletes that you can train short course and race long course. It’s all about how you approach it.”

—Dick Shoulberg

Cord Training

This is another key component of long course training in a short course pool. In simple terms, Gillett spells this out as a way to “develop the performance variables that were needed for long course success.”

Exhibit A: Hyman. During her

developmental years, cords were used solely in a resistance mode. “We had Misty swim until the cord created a maintainable resistance and counted cycles,” Gillett explains. “During the last 10 cycles, she would get close to the wall. We had it down, so that if she had a great effort, she would barely be able to lunge the last cycle and touch the wall before it yanked her back.

“It was very difficult.”

The following list highlights some of that training:

- 3 x 80 cycles, 3 x 60 cycles, 3 x 40 cycles, 3 x 20 cycles.
- 3 x (1 x 80 cycles, 1 x 60 cycles, 1 x 40 cycles, 1 x 20 cycles).
- 3 x (1 x 80 cycles, 3 x 20 cycles).
- 3 x (3 x 40, then 200 yards of pull).
- 5 x 25 power cords with a dive.

Also, a valuable tool for cord training is the Kick Machine, a stretch cord device concocted by Joe Phillips, a well-known coach in the Grand Canyon State. The device has a foot attachment with cords and attaches to a belt. “It offers great leg extension resistance,” Gillett says.

Other cord training involves monofin kicking against the cords.

Examples of this training include:

- 10 x Power Cord Kicks.
- 10 x Power Cord Kicks with Kick Machine.
- 10 x Power Cord Kicks with Monofin.
- 10 x Power Cord Kicks with Mono and Kick Machine.

Certainly, there will continue to be debates over the best way to train for long course competition in a short course pool.

But this much is certain: “If you have two equal athletes, the one doing the most yardage will win *almost every time*,” Gillett concludes.

Case closed. 

Ed Odeven is a sportswriter for the Arizona Daily Sun in Flagstaff, Ariz.



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Not Your Grandma's Workout

It is important to evaluate the biomechanical movements of a swimmer during his or her activity before developing a proper exercise program that will meet specific, individual needs.

By J.R. Rosania

Exercises demonstrated by Ann Barton, University of Notre Dame Photos by Michael Aron

When swimmers think of weight training to help them swim faster, most revert to either light weights with high reps or heavy weights with low reps. Far too often, what is overlooked are the exercises they perform.

Every swimmer relies on body position in the water, and each swimmer is positioned differently in the water. What is missed most often is making sure the swimmer's balance in the water is not ruined.

By lifting weights that are too heavy—without proper stroke and body-specific exercises—the swimmer overdevelops the wrong muscles. Consequently, the underdeveloped muscles do not get the work they need. This often leads to slower times and even injury.

When it comes to weight training for swimming, most people are in the dark about how to train. Should it be high reps, light weights? Heavy weights and

low reps? What about squats? What about training the legs? These questions are asked often, but usually go unanswered.

In this article, I will show several examples of how to use resistance training for swimming backstroke and, more specifically, how to benefit from it.

Most swimmers and coaches copy their weightlifting exercises from bodybuilding workouts, usually from a

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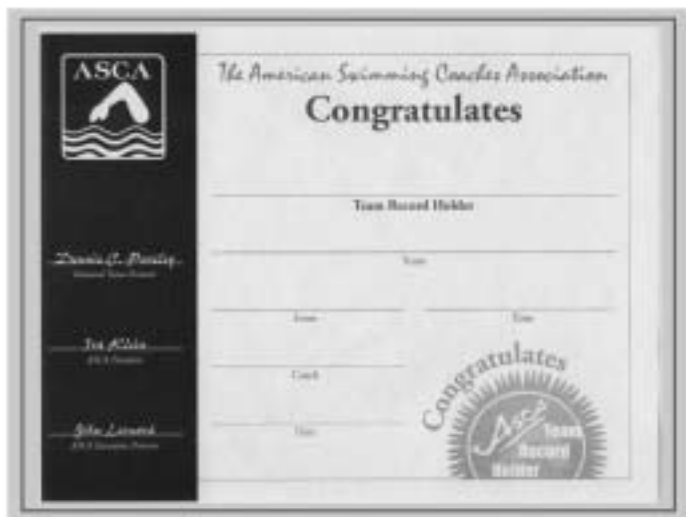
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Weight Training

strength coach who works with the football team. Although these workouts might have some benefits, they are not specific to swimming or the specific stroke of the swimmer.

Developing a Program

When developing a program, I first consider the biomechanical movements of a swimmer during his or her

activity. The specific exercises I generate are based on these movements.

Many of the exercises are standard movements, i.e., lunges, step-ups and squats for starts and turns, or lat pull-downs, rows or triceps extensions for stroke. I have also developed many movements that simulate the body's movement and function as well as the mechanics of the specific stroke.

Along with the proper exercises and movements come patterns and progressions of exercises. Without the proper changes in the dryland training routine, the swimmer will lose enthusiasm and become stale, and his or her improvement will slow or even stop.

To get beyond the remedial level, the athlete must be closely supervised by a knowledgeable trainer. Response to the training will then determine how—and how quickly—the individual will progress. Training modalities such as intensity, exercise volume, exertion, effort and proper progression are all factors in achieving maximum benefits.

Let's take a closer look at the training.

As previously stated, the first thing I do is evaluate the athlete's sport and the movements the athlete performs. Next, I evaluate the athlete, looking for strengths, weaknesses and imbalances in the muscles. Also taken into account is the level of performance the athlete has already achieved. This will determine the level and degree of difficulty of the training program.

Most of the training sessions consist of full-body workouts with a combination of sport-specific movements, core exercises and aerobic/anaerobic conditioning. Sessions last 60-90 minutes, with short-duration rest periods built into several 3-5 exercise circuits, each lasting 10-15 minutes.

Leg Strength/Cardio Set

A typical set for lower body training consists of walking lunges, alternating step-ups, uphill treadmill running, one-leg curls and stair climbing. Each exercise is performed for 60 seconds. After completing the exercise, the athlete moves on to the next one. The circuit is repeated two or three times.

The cardio activity can be adjusted to be aerobic or anaerobic, depending on the intention of the set. The weights used are very light to begin with, but can be increased as the athlete's strength and endurance progress.

Upper Body Strength Set

Most upper body exercises are designed to help assist the swimmer

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One-Leg Deadlift

with his or her stroke. In swimming, upper body strength is necessary. A swimmer has specific needs and biomechanical movements related to stroke technique.

I like my swimmers to perform body weight, upper body movements such as

chin-ups, horizontal body weight rows, push-ups and one-arm holds. These can also be performed with medicine balls and exercise balls.

Swim-specific exercises such as hammer rows, one-arm dumbbell (DB) rows and shrugs plus stroke-specific move-

ments such as prone butterfly stroke, DB freestyle stroke, straight bar abduction and DB kickbacks are done in a circuit format. By combining several movement-specific exercises, the athlete can train through the very movement and activity of his or her sport.

Straight-Leg Medicine Ball Pass



Weight Training

Core Training

The core is the central point of the athlete's body. If the core is weak and breaks down during activity, the body will lose power, endurance and biomechanics. This will lead to slower times and even injury.

I have each athlete complete several core and stability exercises to prevent the breakdown. Medicine ball, exercise ball, ab dolly, wheel roller, body weight positions and partner exercises are some of the movements the athlete performs. Each exercise is performed for 60 seconds or, in some sessions, a specific number of reps. These core training sessions can last as long as 20 minutes of "gut"-wrenching work.

Backstroke-Specific Training

We now will look at several backstroke-specific exercises. The photos demonstrate the particular movement or series of movements to mimic the stroke. Sometimes, several exercises will be performed in a circuit to complete the stroke mechanics.

Lower Body

One-leg deadlift. This movement strengthens the lower back, glutes and hamstring, and improves balance and stability throughout the body.

Straight-leg medicine ball pass. This exercise works the hip flexors, lower abs and thighs, and increases kick strength.



Standing DB Backstroke Arm Raise

Upper Body

Standing DB backstroke arm raise. This is for arm and shoulder strength.

Stroke ball throw. This movement mimics the arm movement during the underwater phase of the stroke. The weighted ball adds resistance and enables the swimmer to improve his or her stroke speed.

Tube stroke movements. Both the

lying and standing exercises using a resistance tube allow the swimmer to work on the mechanics of his or her stroke, with resistance.

Putting It All Together

I have seen outstanding results with this type of training. In the past year, several of my swimmers qualified for sectionals, nationals and Olympic

Stroke Ball Throw





Standing Tube Stroke Movements

Trials, while many others have won state championships.

Misty Hyman, returning from shoulder surgery, won another national title in the 100 fly last year. One of Misty's training partners, 14-year-old Katherine Raatz, won her first junior national championship in the 100 fly. I could name many other swimmers who have trained with this model and have seen great results.

The key in achieving positive results is being consistent in the workouts and doing two to three workouts a week for months and months. The body will adapt to the difficulty of the workouts and will make rapid progress. The gains in strength, balance, endurance and injury prevention will allow the swimmer to train and compete at his or her best.

J.R. Rosania has over 20 years of experience in the performance enhancement field. He currently trains swimmers, runners and triathletes, as well as a number of professional athletes for strength, nutrition and conditioning. He can be reached at the Center for Human Performance in Phoenix, Ariz., or by e-mail at jrhealthplex@aol.com.

Lying Tube Stroke Movements





Teaching

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By Gilbert Legaspi

Our coaching staff works on stroke skills every practice session to develop a solid foundation in stroke mechanics not only in freestyle, but in the other strokes as well.

As swimmers progress throughout the program, they build on the foundation of skills they have mastered to refine their stroke mechanics. Our goal is to provide these young swimmers with the necessary skills to advance their swimming endeavors by using stroke drills that emphasize body position, kicking and full stroke swimming.

Swimmers start by establishing the correct body position in the water by working on their streamline position as they glide through the water (**Photo #1**).

Swimmers are in the “streamlined” position by having their arms straight above their head with hand over hand, fingertips aligned and with their biceps squeezing their ears. They keep their feet together and look straight down directly at the bottom of the pool.

To make sure swimmers are balanced and in the correct streamlined position, part of the swimmers’ head and part of the suit on their hips are breaking the surface.

Once the correct body position is established, we emphasize the kick (**Photo #2**). Not only can kicking

maintain the proper body position, but it is also a great way to improve aerobic conditioning and is a necessary skill for fast swimming.

Our developmental squad often kicks without the use of kickboards when they do kicking drills. Too much kicking with the board promotes poor body position in the water. Our swimmers do their kicking drills in a streamline position, on their back, and also on their side (with one arm stretched out and the other on their side).

We work on full stroke swimming (**Photo #3**) only after our swimmers have mastered skills necessary to establish the correct body position while kicking.

One of our favorite drills is catch-up

Photo #1. Streamline Position



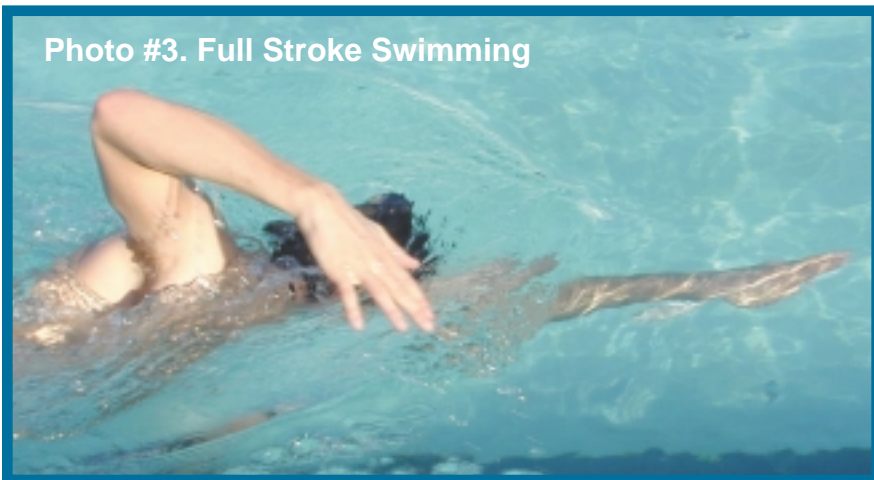
Photo #2. Kicking



Freestyle



Photo #3. Full Stroke Swimming




freestyle while holding a pipe (a foot-long PVC pipe). This drill (**Photo #4**) incorporates maintaining the proper body position while emphasizing the kick.

We tell swimmers to enter the water fingertips first, with little or no splash, and reach forward for extension while letting the body roll naturally. Swimmers then point their fingertips down to the bottom of the pool with elbows up as they do a stroke and push back.

We remind swimmers to think about their arms as paddles that run from their fingertips to their elbow.

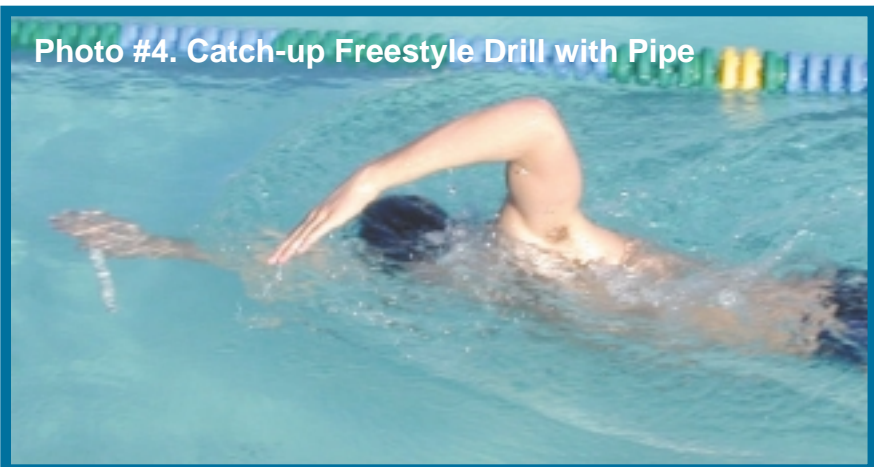
On the recovery, we want them to “circle their elbow” forward with a

“limp wrist” and bring their arm back in front in a relaxed manner. We teach our young swimmers to learn to breathe on both sides (i.e., every third stroke) to promote a balance and rhythm in their stroke.

By mastering these skills in freestyle swimming, swimmers consequently swim more efficiently and establish the proper foundation for the other skills necessary to develop the other strokes. These skills are taught to our developmental swimmers and continuously emphasized to our elite athletes. 

Gilbert Legaspi, an ASCA Level 4 coach, is the head coach of the Houston Swim Club.

Photo #4. Catch-up Freestyle Drill with Pipe



NSSA Changes Name, Upgrades Brand

The National Swim School Association, a non-profit association of private swim schools founded in 1988, officially announced a change in its name to the United States Swim School Association. The change takes effect immediately and reflects the organization’s continued efforts to create one of the most recognizable and valuable brands in the aquatics industry.

“While we are cognizant of the NSSA’s history and tradition, this simple name change will have an extremely positive impact on our ability to attract new sponsors and members while also enhancing our reputation and credibility both domestically and internationally,” commented Scott Bartle, the Association’s executive director. “We anticipate this change further positioning our beloved organization as the foremost learn-to-swim authority in the United States and one of the most respected associations anywhere in the world.”

The United States Swim School Association currently boasts more than 275 members, representing almost 500 swim schools across the country. Visit www.USSwimSchools.org for additional information.

Best of “Tips on Technique”

Swimming Technique’s website, [SwimInfo.com](http://www.SwimInfo.com), regularly publishes “Tips on Technique.” Following is a sampling of some of the tips that have appeared online—The Drop Push, Freestyle Flip Turns and Breaststroke/Butterfly Turns. Be sure to check out www.SwimInfo.com regularly to learn more on technique.

Proper Getaway: The Drop Push

Drop-pushing off the wall every time you start a repeat in workouts will help you develop several important skills: improving your body position during open turns (butterfly and breaststroke) and attaining a consistent depth every time you push off a wall.

Not only is the drop push good for developing good habits, but it is also much more efficient (both easier and quicker) than jumping off the bottom of the pool or treading water with your hands, trying to balance your feet on the wall.

Set-up (Photo #1)

Set yourself up with one hand on the wall and the other extended toward the opposite end of the pool with the palm facing up. Focus your eyes on the hand that’s on the wall, with your chin almost touching your shoulder. Plant the balls of your feet (not your heels) on the wall with your feet pointed parallel with the bottom of the pool.

Drop (Photo #2)

Bring your head back, look toward the sky and allow your body to drop down until your torso is aligned with your lower body (parallel with the bottom of the pool). Your hands should be together and overhead, with your elbows bent slightly.

Push (Photo #3)

As you push off, your elbows should straighten, tightening your streamline so that as your toes leave the wall, you are in a tight streamline and on your side (perpendicular with the bottom of the pool).

Streamline (Photo #4)

Now rotate either onto your front (freestyle, butterfly or breaststroke) or onto your back (backstroke).



Maintaining Proper Body Position During Flip Turns

This “Tip on Technique” looks at how you can attain proper body position on freestyle flip turns. The turn is demonstrated by world record holder Lindsay Benko.

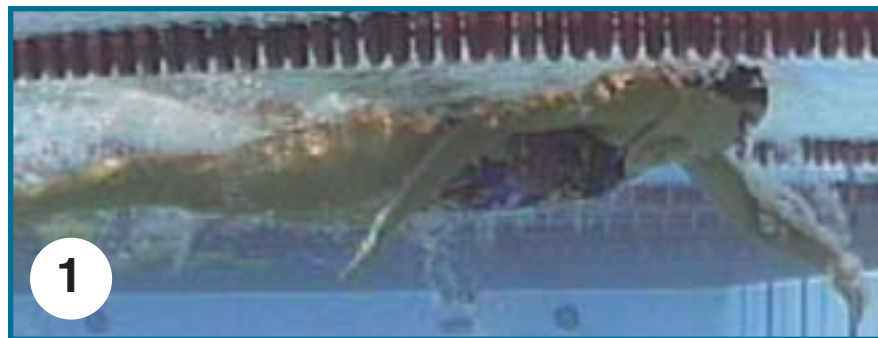
Photo #1. Without breathing on the final stroke, make final adjustments, eyeing the target on the wall while kicking vigorously.

Photo #2. On the final arm stroke, let your eyes follow your hand as it pulls past your head. This will sustain your momentum into the turn. You will slow down considerably if you pull your arm down to your side without tucking your chin. You can see that Lindsay’s right hand is stopped at her side; it will stay there throughout the turn.

Photo #3. As your last pull passes by your chest, you can take a quick dolphin kick in order to snap your heels, ankles and calves over the water with the water line level with the knee caps. The “snap” of the heels is timed to coincide when both arms are at your sides. The press of both arms downward toward the face initiates the “snap.”

Photo #4. Once you have flipped your legs over, your arms—which are now overhead—should still be at your sides, ready to streamline off the wall. The balls of your feet should be on the wall, toes up.

Photo #5. As you push off the wall, tighten your streamline as you turn onto your side, positioning your body perpendicular to the bottom of the pool.



Best of “Tips on Technique”

Breaststroke and Butterfly Turns

When performing a breaststroke or butterfly turn, your goal should be to get into and off the wall as quickly as possible. How fast you can turn depends largely on how quickly you can get your feet onto the wall.

The breaststroke and butterfly open turn can be broken into three distinct phases:

- Chest Slap
- Hip Slap
- Hand Recovery Close to the Cap

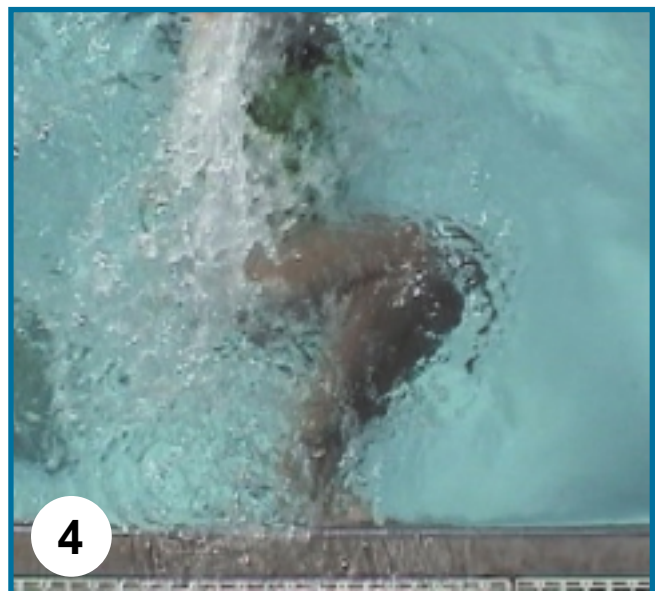
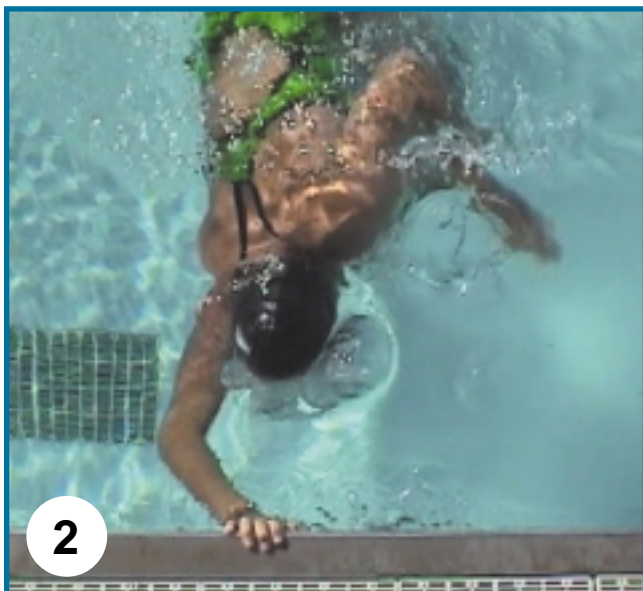
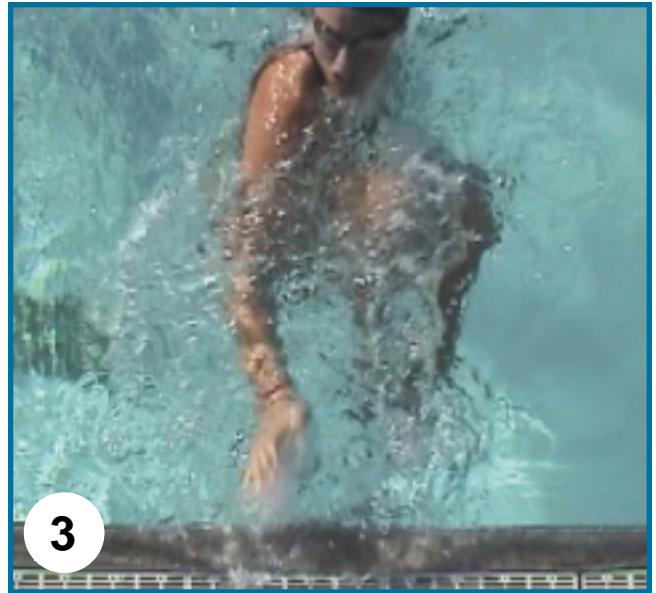
Touch (Photo #1)

Chest Slap (Photo #2)

After both hands simultaneously touch the wall, one arm is immediately brought back into the body with the elbow pressed against the ribs and the hand slapping the upper part of the chest, close to the shoulder (some coaches modify the positioning of this arm).

Hip Snap (Photo #3)

Draw your knees up quickly toward your chest and the wall with toes pointed. Both chest slap and hip snap movements are performed simultaneously. This causes the shoulder of your recovering arm to drop in the water while your hips



rotate to allow you to place just your toes horizontally on the wall. While your legs are brought under the body, the head and shoulders are brought straight back, looking up toward the ceiling or sky.

Hand Recovers Close to the Cap (Photo #4)

The hand that remained on the wall will recover close to the head as if you were saluting to the official standing over your lane. Continue to drop back until your feet are on the wall and your hands meet in a streamline.

Push off the wall with your toes only, as if you were jumping rope. Your heels should never be placed firmly on the wall. When pushing off, your feet are planted on the wall, parallel with the bottom of the pool. This will help you to push off more on your side, since pushing with the toes pointed down causes a lot of resistance.

As you push off, you will twist the body in a corkscrew motion onto the stomach. Your feet must push off with your shoulders past vertical and with your chest facing the bottom, as you hold your streamline tight by squeezing your arms against your ears.

Two Common Errors

There are two common errors in doing breaststroke and butterfly turns: the "spin-like-a-top turn" and the "pull-up turn."

If you "spin like a top" when you turn, it may be because you are rotating your head in a "no" motion and rotating your shoulders horizontally through the water. To correct this, keep your eyes on the wall until your feet are on the wall. The speed of the turn does not depend on how quickly you get your hands on and off the wall, but how quickly you get your feet on and off the wall! Once your feet are on the wall, bring your head back into your streamline, looking upward rather than turning your head to the side.

Pulling yourself up out of the water as you turn probably means that you are grabbing the lip of the wall and pulling your shoulders and chest up and out of the water. This turn will cause you to lose most of your momentum since you want to get "in and out," not "up and down." When your hands touch the wall, rather than pulling yourself up, immediately bring one of your elbows back and drive your bent knees and feet into the wall.

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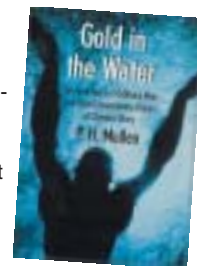
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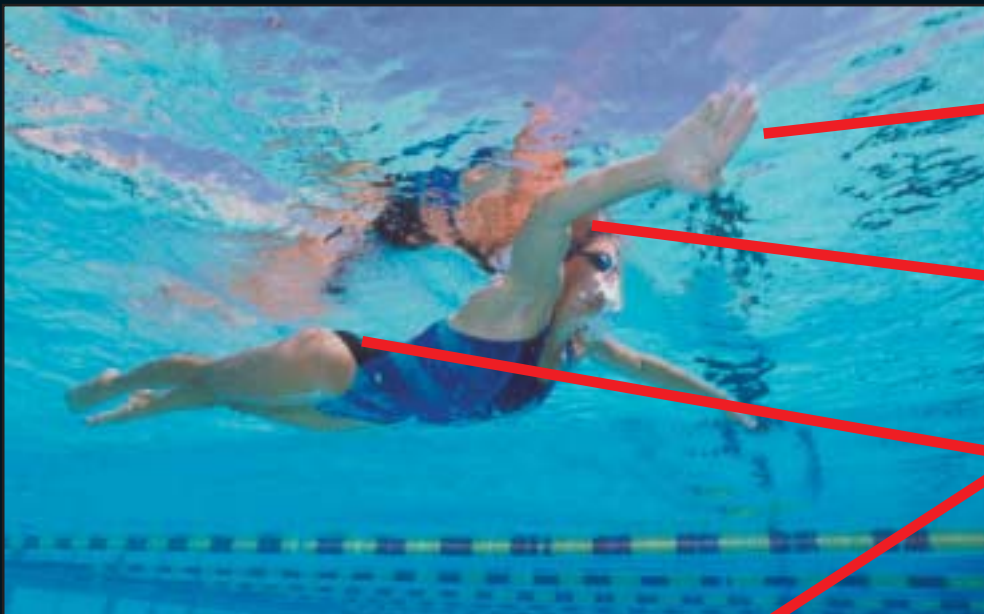


TECH

T I P S

Amanda Beard's Breaststroke

Photos by Michael Aron



• Pitch your hands outward, pressing the water out.

• Keep your elbows high, preparing for the downsweep.

• Keep your hips high in the water throughout the stroke cycle.



• Look *downward* throughout this phase of the stroke, allowing for more power in the pull and better timing.

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