The World Swimming Coaches Association

Newsletter

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MAJOR CHANGES AT FINA

By John Leonard

During the next twelve months, FINA will host a "Constitutional Congress" to consider a series of major revisions to its governing documents. Leading swimming people from all continents are contributing ideas to strengthen our International governing body.

Many of the ideas coming forward, have widespread approval from a collaborative effort of a number of nations.

President Julio Maglione has indicated real support for one idea in particular that will be a historic change in FINA. **That change is the Placement of the Chairman of the Athletes Committee, and the Chairman of the Coaches Committee, on the FINA Bureau with voice to speak at the Bureau meetings.**

This idea of course, was championed and supported at the last WSCA Board Meeting in Fort Lauderdale, FL, September, 2009. We are deeply appreciative of the support of the FINA President. It will be part of a large set of recommendations coming forward from a combination of LEN, ASIA and THE AMERICAS.

Also on consideration, is the election (not selection) of the members of the Coaches Committee, to represent all the sport disciplines, and all the geographic regions of the world.

The ability for an elite coach and an elite athlete to contribute to the dialogue at the Bureau level, is seen as a wonderful way to avoid some of the problems in prior decision making processes, where the Bureau lacked sufficient information from the pool deck level to make fully accurate assessments of the current situation. This placement of an athlete and a coach at the highest levels of the FINA will work to alleviate that issue.

WSCA asks that all coaches, in all nations, comment to their Federation about their complete support of this vital and historic step forward.

Additionally, in 2010, FINA has begun a Coach Certification Program for those nations who lack such a professional credentialing process at this time. The first course will be in Colombia, South America, followed by courses in Zambia, Penang, Malaysia, and the Philippines. This is a trial program and if successful, will expand in subsequent years. WSCA Director John Leonard is organizing the program on behalf of FINA.

We welcome and applaud the inclusion of coaches and athletes and the recognition by FINA of the partnership relationship that must exist with coaches and athletes to grow Aquatics World Wide.

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IDENTIFICATION OF POTENTIAL SWIMMING TALENT

by David Crouch & Mark Crouch – Aquabears S.C

Could we expect that any offspring of Agassi and Graf would be a potential Wimbledon Champion? The answer statistically could be yes but ONLY if the person was trained correctly in that sport. The genetic probability of the person being of athletic stature is high but that body could be trained in an alternative sport from a young age. So while genetic status is important, it is the correct training through many years that will produce a champion. How then, can we identify young people, who may become champion swimmers in their future?

This article will identify ONE way of determining swimming potential in young and mature persons and can be carried out from about 10 years of age.

It was suggested by Madsen et al, that 400m velocities could be used to identify potential champion performances. These were stated under the titles of;

SPRINTER	MIDDLE DISTANCE	LONG DISTANCE
1.352	1.431	1.437
1.464	1.519	1.611 METRES/SECOND.

Using the Howat/Robson tables the above equate to a 400m velocity of;

4.56	4.40	4.38
4.33	4.23	4.08

Using only the fastest velocities these equate to speeds at lactate 10 (whole blood lactate oxidase) of;

100m	200m	400m
56.2 secs.	1m56secs.	3m47secs

This is confusing as it apparently makes no differentiation between males and females but in general has become to be accepted as too slow and it is suggested that more likely velocities to be able to compete at World level would be Long Course velocity values of;

Females	4.22	4.23	4.26 maximum
Males	3.58	4.02	4.04 maximum

This accounts for the approximate 10% difference between males and females under normal health conditions.

Using the Howat/Robson 2x 200m MEGA (Modified East German Aerobic) Test, (Ref.1) individual aerobic velocities can be determined within ONE minute of the test swim being completed and training times can be calculated immediately. Using data collected from the past 25 years, the ages and expected velocities of potential champions can be stated as;

	Females	Males
16-17 years	4.30 ‘s.	4.02/3 v.
14-15 years	4.40 ‘s	4.14 – 4.18 v.
12-13 years	4.50 ‘s	4.22 – 4.26 v.
10-11 years	5.00 ‘s	4.32 – 4.35 v.

These velocities can be used as a guide to potential only if monitoring is carried out at least monthly over several years.

It has been said that children do not produce lactic acid. This is totally wrong. If a child's body is stressed, an increase in lactic acid can be expected. It is through the puberty years that monitoring is essential. With the onset of puberty, a large increase in aerobic capacity may be expected. This will decrease as the hormonal status settles down. Correct monitoring during these years is necessary as the increases and decreases in capacity become more frequent. Without monitoring, overtraining is likely and permanent damage is possible. It is not difficult to monitor this capacity, as the well being of the swimmer is paramount. Using the above velocities, if potential is suspected, extreme care should be taken with that swimmer and the potential nurtured over the years, especially if the swimmers attend any training camps which may be alien to their normal training environment. At that time accurate medical monitoring should take place with the results interpreted by qualified staff.

The aerobic status is only one side of the coin therefore the anaerobic levels must be determined. There are several ways of testing for the anaerobic capacity but peak lactates after racing are shown here. If we look at a few race examples that took place in Britain, we can see the difference in body capacity.

A British and Scottish record was set in this race, May 1992. 100m freestyle.

The first swim indicates good pacing throughout the race and if the lactate had approached 10 instead of 8, the time would have been 1.2 seconds faster but at the time the anaerobic status was only near to 8.
The second swim with a slower time and a higher lactate appears to indicate that the swimmer went out fast and hung on and this is consistent with a better anaerobic power than the first swimmer.
The second swimmer has gone on to be a top class 50m performer, while the first swimmer has consistently done well in 100 and 200m events at a World level.
In the same year,

Sandra Volker: 56.24, 7.3, 8.1, 8.6, 9.6, 8.4

A faster time with a higher lactate indicates a good effort throughout the race and training that has obviously been targeted at both the aerobic and anaerobic status. In most publications (Ref.4) a half-way split lactate has always been stated at 60 – 65% of the swimmer's known peak lactate at 3-5 minutes after the race completion. It would appear from the data now available that the half-way lactate might be as high as 67 – 75% of the maximum attained at the 3-minute time (4mins. maximum). The first swimmer reached the 70% mark at the 3minute sample. The second swimmer was at 82% at the same time. The German swimmer was around 75%.

Backstroke results 100m.
Name: HM Time; 57.08, 3.6, 5.8, 6.6, 7.4, 6.8
Final; 55.4, 6.2, 9.1, 9.0, 8.7 Mmol/l

The heat swim was slow pacing reaching only 48% of the maximum. The final swim nearly 2 seconds faster reached 69% of the maximum, a far more controlled and paced swim effort.

Fly 100m Female.

Name: PS	Time 1.02.78	5.9	7.5	7.6	7.4		OQT

This represents 76% of maximum with controlled pacing.

Fly 200m	Time 2.14.97	6.6	7.3	8.5	9.1	8.8	OQT

This represents 72% of her maximum with controlled pacing. It does show that the maximum body level of over 9mmols was not attained in the 100m race. If this level had been achieved, it would have been at 67% of her maximum with a time equating to 1 second faster. It is therefore essential when coaching swimmers at overload for half way potential that exact lactate levels are reached and definitely not exceeded. The highest lactates should be expected in the 200 and 400 IM races. The lactate after the first stroke can be expected around 50-60% of maximum, rising to 70-75% after the second. The breaststroke then gives a slight lactate recovery increasing about 1-2 mmols at the end of the third leg. This then accounts for nearly 85-88% of the known maximum. The freestyle leg increases the lactate a further 2 mmols. If we now consider an Olympic Gold Medallist, swimming easily in this country;

Event 200IM

Name: SM	Time 2.22.16	4.1	5.8	5.4	4.9

Indicates about 68% of the total effort at 3 mins, however this race was easy for this lady without too much effort.

400IM

Time 4.57	4.6	6.3	6.9	6.5

Indicates about 66% effort with a well-paced race.

Olympic lactate levels at the end of her races were higher but with a similar pacing effort. Results from British swimmers in these events indicated very erratic pacing achieving higher peak lactates but slower race times. A programme, which establishes a high aerobic capacity must be essential for these events and combined with carefully controlled and monitored high lactate sessions. Any calculation of the split time must be done from the current aerobic status. For example in training from a push start, a female with a reference of 4.30 and therefore a training time of 1.03.4 at threshold, would need to swim 1minute to reach lactate 7 and 57.6 to reach lactate 10, subtracting the dive time would give the potential competitive swim time. Therefore it is critical that accurate calculations are made for training and not guessed from the swimmers current best time, as they may not be able to repeat that effort at the time of calculation.

Conclusions.

The swimming velocities stated in this article were monitored through many years of junior swimming and continued in most cases at senior level. To identify potential, it is suggested that these velocities are accurate for the development of champion swimmers. If a club swimmer does not achieve these velocities at the correct ages it is probable that World class swimming is not within the genetic make-up of that person. Good club and county level swimming may be possible but the step up to national and onwards to World Class is unlikely to be achieved.

All blood testing was carried out with Analox clinical grade analysers to maximise the accuracy and precision of the results. Standardisation of the clinical instruments was checked with external Quality Control material. Therefore the results can be stated as clinically accurate.

Many of our British swimmers have attained peak lactates in excess of 12 mmols, (Ref.2) this has usually occurred due to extreme fatigue and associated with slow times. The known peak lactate can be increased if training is performed with the correct work/rest intervals. (Ref.3) It is however, probably genetically set at a maximum for that individual and can only be altered further by using banned substances. The mean peak lactate of British swimmers during the years 1985 to 1995 showed a dramatic decline (Ref.4). While there has been an attempt to correct this in the last 10 years, not enough accurate work appears to have been carried out on this capacity.

The blood monitoring of swimmers should be carried out approximately every 3 weeks as this time factor allows for a physiological response to training. For convenience, we could test every month. This is essential for the correct monitoring of a training stimulus. Training times can then be adjusted faster or slower dependent on the results. The human body can not just get faster; it is a normal body response to slow down and this is important to detect, otherwise over-training will occur. Any clinical reactions that occur due to air travel, heat, humidity or an increase in training yardage can be identified quickly. The testing merely indicates what the body is capable of and when it is ready to resume the normal programme.

If we use the figure of 12 mmols. (Whole blood lactate oxidase method) as an example, it can be stated that a female with a reference of 4.28 long course should achieve a competition time circa. 1.57.6. for 200m freestyle. A 4.30 reference would give 1.58-1.59 and at a 10-mmol maximum the swim time could be expected around 1.59.5- 2.00 mins. Therefore it appears essential that British swimmers anaerobic capacity should reach at least 12 mmols of lactic acid and 7.6 to 8.4 at the overload stage, this being checked during training to make certain those levels are attained. If we do not check, we cannot know for certain that the training stimulus applied is correct. We cannot expect our swimmers to achieve that lactate level in competitive events if the body has not been trained correctly for high level racing. At a similar aerobic capacity, the swimmer that attains the higher lactate with controlled pacing will win. While British records have been broken in the last 10 years, they rarely have kept pace with World performances. On the odd occasion that we have expected a performance matching the rest of the world, it rarely occurred. Lactate testing could have given the information to answer the question *why*?

All results gained from peak lactate and aerobic monitoring show that with a good aerobic capacity and the ability to produce high lactates, world class swimming is achievable. Our swimmers can only swim the races they have been prepared for. If the training was wrong it is not the fault of our swimmers. Recent Olympic results from our swimmers have shown slow times with associated high lactates. This indicates that the swimmer tried as hard as the body would allow and that the fault occurred in training not during their swim. If the Australians, Canadians and Americans consider that testing lactates routinely during training and at competitions give essential information on performance, could we not do the same? These countries were performing these tests at the last World Championships. How did we assess our swimmers performances? The information obtained from warm-up, aerobic tests, peak lactates and warm-down, provides a valuable guide for future training, competition and coaching.

If we wish to compete at their level, the job of monitoring must be carried out accurately for the benefit of our swimmers. Following the suggestions in this article will begin the process of seeking potential future champions; what happens to them, as youngsters will set the stage for senior swimming.

Ref.1. Streamlining Lactates. Swimming Technique. Feb-Apr. 1990 Page 32.
Ref.2. Maintenance of aerobic capacity during anaerobic work. Swimming Times Oct.1990 Page 20.
Ref.3. Basic principles of race pace training. Swimming Times. July 1995 Page 25
Ref.4. A 10 year study of peak lactates. Swimming Times. May 1999 Page 24.

‘Tapering and Peaking for Optimal Performance’ by Inigo Mujika (Human Kinetics, 2009)

A Review by Forbes Carlile

With this comprehensive scientific and practical exposition of the taper in some 208 pages, Dr. Mujika has produced the first book on the subject.

Less academically trained coaches not equipped like the author with a double doctorate, may be challenged in comprehending the graphs and tables.
They will however be relieved to find ‘At a Glance’ summaries scattered throughout the twelve chapters, as well as chapter summaries.

At least until the end of the 1930s there was generally much less heavy training carried out than is seen today – certainly in swimming — where as little as a mile a day was once considered noteworthy. Consequently the need to ease down in order to recover before an important competition was hardly necessary. In the mid-1940s in Australia, with much harder training, I believe the idea of the taper was conceived. The concept was formally described in Forbes Carlile on Swimming (Pelham Books, London 1963). Only later was the descriptive term ‘tapering’ to be found in sporting and scientific literature.

There was very little published on the subject of tapering until articles appeared in scientific journals in the 1970s. Such articles have grown in number from the 1980s through to the present day.

Mujika, the scientist, goes much further than reporting concepts. He is interested in seeking reliable knowledge established in peer-reviewed articles. It is in this that much of the value of Mujika’s work lies. He then translates the findings of his research into practical advice embracing a number of sports, including swimming and track (both sprint and endurance events), a precision sport (archery) and team sports (rugby football and hockey). Elite sportsmen and women and coaches give detailed advice on how they tapered. Coupled with having had experience in coaching some world-class athletes in various disciplines, Mujika has been involved in research projects reported in more than 20 scientific studies amongst some 350 articles quoted in the book.

Athletes and coaches will find much in Mujika’s clearly-expressed advice to set them thinking. For example there is the principle that the taper should not only serve to allow recovery from the fatigue resulting from heavy training, but should also be designed to address the need to maintain and enhance processes of specific adaptation required for the targeted event.

Speaking of adaptation – this reviewer was somewhat surprised that the author did not mention the theory of failing adaptation, as described by Hans Selye (1909-82). As a part of his all-embracing general adaptation syndrome Selye described the possible diminished physiological functioning caused by excessive application of ‘stressing agents’, of which physical exercise may be one. He named this diminished functioning ‘failing adaptation’ and identified likely symptoms such as general fatigue, weight loss, joint and muscle pain, intestinal upsets, swollen lymph glands, mild colds, psychic unrest, irritability and insomnia.

However, this oversight, if it is one, is a minor criticism which may be well defended, because the book does contain comprehensive coverage of some possible cardio-respiratory, biochemical, neuromuscular, immunological and psychological changes resulting from over-training.

A suggestion not made by the author, and granted there can only be anecdotal evidence to support the theory, is that the recovery processes during tapering may include the repair of over-use damage to the central nervous system caused by excessive, intensive effort. This is suggested by the deterioration in performance of one whole-body activity whilst another similar activity is performed normally. For example a swimmer may be performing poorly at his main stroke but with little or no recent practice do well in another.

With its focus on experimental evidence, Mujika’s work is a very valuable contribution to knowledge concerning the optimisation of human performance. It could result in many revising their ideas about the taper.

2009 World Ranking Certificates

3/25/10

With the help of Nick Thierry and SwimNews.com, the World Swimming Coaches Association annually sends out certificates in recognition for a top-25 year-end finish in the annual long-course World Rankings. Certificates for 2009 rankings are now in the mail to the 47 countries that had at least one of the 519 individuals who swam into the top-25; these mailings were directed to either a country's national swimming federation or their national swimming coaches association. The 519 swimmers are divided into 272 males and 247 females.

A summary of the countries with 2009 rankings:

Algeria (1) – 1 male
Australia (39) – 18 males, 21 females
Austria (5) – 3 males, 2 females
Belarus (3) – 1 male, 2 females
Brazil (27) – 20 males, 7 females
Canada (15) – 4 males, 11 females
Cayman Islands (1) – 1 male
Chile (1) – 1 female
China (56) – 11 males, 45 females
Colombia (1) – 1 male
Croatia (3) – 2 males, 1 female
Denmark (7) – 2 males, 5 females
Estonia (1) – 1 female
Faroe Islands (1) – 1 male
Finland (2) – 1 male, 1 female
France (28) – 17 males, 11 females
Germany (21) – 12 males, 9 females
Great Britain (25) – 13 males, 12 females
Greece (4) – 3 males, 1 female
Hungary (9) – 5 males, 4 females
Ireland (2) – 1 male, 1 female
Israel (3) – 3 males
Italy (29) – 19 males, 10 females
Japan (52) – 26 males, 26 females
Kazakhstan (2) – 2 males
Kenya (3) – 2 males, 1 female
Korea (1) – 1 male
Lithuania (1) – 1 male
Mexico (1) – 1 female
Netherlands (10) – 4 males, 6 females
New Zealand (5) 2 males, 3 females
Norway (3) – 1 male, 2 females
Poland (6) – 6 males
Romania (1) – 1 female
Russia (21) – 13 males, 8 females
Serbia (4) – 3 males, 1 female
Slovenia (7) – 5 males, 2 females
South Africa (15) – 12 males, 3 females
Spain (12) – 7 males, 5 females
Sweden (4) – 1 male, 3 females
Switzerland (2) – 2 males
Trinidad & Tobago (1) – 1 male
Tunisia (2) – 2 males
Ukraine (3) – 3 males
USA (75) – 38 males, 37 females
Venezuela (3) – 1 male, 2 females
Zimbabwe (1) – 1 female

Country with

- Most total: USA (75), China (56), Japan (52)
- Most males: USA (38), Japan (26), Brazil (20)
- Most females: China (45), USA (37), Japan (26)
- Closest male/female: Japan (26/26), Finland (1/1), Ireland (1/1)
- Furthest male/female: China (11/45 – 34 more females), Brazil (20/7 – 13 more males)
- One (1) swimmer: Algeria (Nabil Kebbab), Cayman Islands (Shaune Fraser), Chile (Kristel Kobrich), Columbia (Omar Pinzon), Estonia (Triin Aljand), Faroe Islands (Pal Joensen), Korea (Tae-Hawn Park), Lithuania (Giedrius Titenis), Mexico (Patricia Castaneda), Romania (Camelia Potec), Trinidad & Tobago (George Bovell), and Zimbabwe (Kirsty Coventry)

Compared to 2008 rankings:

- 2008 had 503 swimmers (16 less than 2009) from 50 countries (3 more than 2009)
- Countries added (6): Algeria, Cayman Islands, Chile, Colombia, Estonia, and Mexico
- Countries dropped (9): Barbados, Belgium, Bulgaria, Chinese Taipei, Iran, Papua New Guinea, Portugal, Singapore, and Slovakia
- Largest increase: China (+31 – 28 females, 3 males); Brazil (+10 – 7 males, 3 females); Japan (+9 – 5 males, 4 females)
- Largest decrease: USA (-16 – 10 females, 6 males); Sweden (-8 – 5 females, 3 males); Australia, Great Britain and Russia (-6)