

# The World Swimming Coaches Association Newsletter

Vol 09 Issue 2

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## WSCA Board to Meet

The next meeting of the WSCA Board of Directors will be on Thursday, July 23, in Rome, at the site of the World Championships, from 2-5 PM. Site of the meeting will be decided closer to the date and will be posted on the WSCA website and also emailed to all WSCA members as part of the daily WSCA Email news compiled by Matt Hooper.

In addition to Board Members, we encourage WSCA members from all nations to come and join us at the meeting. Please let John Leonard know of your intent to attend at [JLeonard@swimmingcoach.org](mailto:JLeonard@swimmingcoach.org), in order that we have enough space for the meeting.

If you have AGENDA ITEMS that you would like to see included on the agenda for the WSCA Board, also please send them to John Leonard at the email above.

Following the World Championships in October, there will be a new composition of the WSCA Board as provided for the WSCA By-Laws, dependent on the order of team finish at the World Championships.

Meanwhile, we look forward to a great championships in Rome and a productive WSCA Board Meeting. Please join us there.



John Leonard

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# A Report from the British Swimming Coaches and Teachers Association Conference

Compiled by Charlotte Parker

## **FRIDAY: Bill Furniss (Coach of Rebecca Addlington) Coaching Rebecca**

Becky copes really well and is generally a fantastic person and remarkable individual. Bill knew that she was different and there was something special about her and they have developed a relationship together as a swimmer and coach over a long period of time.

Bill constantly makes training and life tough for Becky to provide lots of challenges in his training. If Becky adapts to the challenges, which she usually does, he then raises the bar and raises the level of the challenge. Again this is something that Michael Phelps coach Bob Bowman encourages also.

Bill openly states that this at times can mean that you sail close to the wind and you tread a fine line in breaking down your athlete; however, he says you must as a coach know and recognise their breaking points...

He spent a lot of time discussing the Taper prior to the Olympics and the importance of work 6 -7 weeks out from the meet

### **Taper – 6 – 7 weeks to do the work**

70,000	3 weeks out	Main set	4,000m
60,000	2		3
50,000	1		2

He also discussed the point that Becky was exceptional technically and one of the best in the world and had a great kick and therefore felt that he did not need to develop it too much and therefore there was not too much kick emphasis.

He also used a lot of negative split work in his training

Generally Bill would aim to include a maximum number of 6 out of 10 as quality sets per week which is a lot and should not be tried at home unless this is built in progressively and the swimmer can cope and is happy and determined.

He also builds in easy time and easy sets at least once per week, where he does not coach; he is just there on poolside and allows the swimmer time to think for themselves and to have their own time, without the coach going on and on and on.

## **Dave Champion (Coach of Karen Pickering – Ipswich) Head Coach at the World Juniors and European Championships**

Dave talked about this competition and his role specifically in these championships: World and European Junior Swimming Summer 2008. He was appointed by British Swimming as Head Coach for these two meets.

Planning and preparation is key

A large team of staff including different team managers for events at different competitions was required to make this a good and successful competition for the British team.

Selectors and John Atkinson also worked a lot of the planning and preparation work behind the scenes to set up the head coach prior to travel away with the team, and the coach was very thankful for this and felt that he was there to do one job and that was to coach and manage the other coaches who were all responsible for a group of swimmers. His role was about facilitating and creating an environment where the other coaches were doing the best things for their swimmers. It was also felt that all pre-planning done causes an environment where winning is a habit!"

- Coaching protocols in place and ready to run
- Tried transition from World short, through Summer meets to maintain continuity as best as possible for the swimmers
- Coach meetings after each session heat and finals took place
- Team selections and focus was around the kids being a possible 2012 relay. This practice was ideal for the relevant age groups in preparation for 2012. Teams were a target and focus for thinking and the relay teams that were being groomed were:
  - Medley and free and were selected from individual events from the British Trials, that were in the top 16. The whole event was found to be a very worthwhile event for all concerned as part of their preparation.

Other comments for note:

- Offshore centre boys that were a part of the team and were exceptionally professional in their attitude, preparation and this really stood out apparently
- The meets were challenging for a number of reasons such as transport timetables constantly changing, weather and heat conditions constantly changing and importantly these environments were not luxury for the swimmers and these had to be managed with care to ensure limited stress on the athlete.
- The Japanese team really impressed the British just by their chanting and support that they

showed for their teammates, and apparently these guys really set the tone of the meet.

- For the British team a tough learning curve to encourage swimmers to swim fast at all times was the concept, despite 4 swimmers per event in the meets only the fastest from each country could go through to the next round, this made people compete and in my opinion at an early level and importantly a development level encourages individuals to have to focus, rise to the occasion and swim fast.
- A calm flexible approach was required at these two competitions at all times by the staff.
- The transition between the two competitions was tough as there was only 16 days between them and this was tough in terms of how to support athletes
- The approach was simple though...1 week – low intensity and volume – to recover from jet lag and then in the second week following recovery the intensity was raised and more pace work was added into training to provide some form of maintenance of form and to keep swimmers sharp.
- The Head Coach had to manage the Team Coaches to ensure they had everything that was needed. This individual did not have a typical group of swimmers to work with.
- Training Strategy with large numbers of swimmers, can provide for distractions as the meet moves on and this needs to be considered. One way of controlling for this was as racing finished, training started... at times with a team of teen swimmers (22 girls, 20 boys) the training strategy helped provide focus to the team.
- It was noted that very few other teams actually completed a swim down
- There were many other teams that were sunbathing and this was noted as including the staff and this would not be recommended.
- Team ethic was high and swimmers supported each other and importantly sang the National anthem
- Expected to swim well – team to come away as winners.

### **Marc Spacman – Coaching Lizzie Simmons**

Talent ID – seems reliant on mentality and how the athlete can focus and apply mental strength and turn race around, and this was something very evident in Lizzie.

In the lead up to the games, the main emphasis of each year was as follows:

Year 1 – develop relationships

Year 2 – technical work and also to develop a more athletic body – decrease CHO and Fats. Home life helped a lot here as Lizzie's diet was much easier to control, the mum was really supportive, the whole family had to take on these dietary changes and they did willingly.

Strength development – specific to weaknesses and strength of the individual

Develop speed and athleticism following training

Year 3 – Core stability

Year 4 - Develop speed work

Stroke Rates with the Aqua Pacer

Lactate production sets

Endurance background and using post activation

Potential in speed sets... (Complex training – land work – tire up the muscles... really develop race warm up)

- All sets were discussed on a weekly basis – this encourages the coach to buy in and then the swimmer buys in...Marc and Lizzie had very much a team attitude.
- Lots of HR sets were a part of training
- Kick developed to 7.5m at every swim
- Swimmers need different focuses to share with swimmers
- Tendonitis in shoulder, hip flexor injury... it was a challenge to fit her land work around what she was doing.
  - Very driven athlete
  - Most swimmers don't all like doing challenges in the same way and would struggle
  - A lot of work was hypoxic 2500 m underwater – lots of hypoxic work
  - Speed all season

### **Dave Marsh – Coaching Margaret Hoelzer and Kirsty Coventry**

Expectations need to be continuously set higher

DM was and appeared to be very athlete-centred – and was very in tune with athletes' personality and backgrounds and tries to understand why they are like they are...

Totally different individuals in every way and was described as chalk and cheese

Margaret Hoelzer and Kirsty Coventry have both used the LZR – and feels that it really helps with core stability to help with someone that is not that strong in the core programme

DM discussed a little of his thoughts on Backstroke – he feels that with backstroke we are now moving to a stroke where there is a grab and throw down action. He used Lochte as an example and mentioned that he tends to move his body position to get most propulsion from hand. Girls, due to strength possibly, rely on more propulsion lift – scull actions

One of the keys to Margaret's development is the competition between herself and Kirsty, but also technically he slowed down rates and then speeded her arms up which was perhaps a significant factor.

When comparing the swimmers M was described as a grip and rip style whilst K – smooth scull. Margaret unfortunately suffers more from poor lines, which means that as lines are poor (body position) the spine comes into more resistance.

The coach very much coached by feel with the athlete and this was felt to make a huge difference.

Again the discussion around: Keep testing until challenges throw them off the rails, as long as you know they will bounce back; this is fine and Dave was another coach to emphasise the same thoughts and feelings about challenging the athlete, as long as this is managed.

**Mark Perry – Open water swimming performance manager for British swimming. Previously a coach of Mel Marshall and Caitlin McClatchley. Coaching open water.**

Initially came from a Club and Pool coach background...

He has joined British swimming, which questionably to other coaches is perceived as joining the dark side. However has joined a department that at the most recent Beijing Olympic games has won in the open water swimming section a massive 3 out of the 6 medals available. Otherwise 50% of available medals... Open water swimming is otherwise known as Marathon swimming and the focus of the discussion was preparation for the 10K in London 2012.

Open water swimming received a lot of positive press over the course of the Games and we long for this to continue.

Coaches in this discipline that worked with the three medallists included Sean Kelly and Kevin Renshaw were asked about the impact that swimming open water has had on the athletes within their programmes. The benefits of swimming 10K for these open water swimmers were as follows:

A different focus was provided and the athletes all realised that speed was required to swim a 10K. In all swimmers there was a change in confidence and the addition of variety.

For the future programmes: There will be a range of Development Opportunities which will come from rankings. There will be a Home country qualification process. For Beijing this was Seville Worlds and out of the 55 swimmers you had to be a Top 10 placed swimmer to qualify by right...so this is by no means a soft option sport or discipline.

The open water development under BS is run under the technical swim committee - under BS, open water swimmers also share grants, funding and also have their own Talent ID programme and aim to have increased opportunities for athletes on teams, increase international reputation.

There are and there will be in future years leading into London 2012:

2 x Junior Development Camps

FINA world cup/LEN cup/Euro Juniors/Euro Seniors/World Championships/Olympic Games/2012 potential coach (open water) will be the proposed competitions identified for future years.

Open water swimmers under the British programme will be made from the swimming pool

The aim is to also get more swimmers onto the World class podium and world class development programmes: currently only one athlete sits on the WC podium programme.

As we are aware with Open Water these are very specific competitions in a strange environment which is tough. One of the ways in which the British have developed their strategy is through...Competition – Race – Competition – Race and the best place is to learn in the water. This is not an

easy environment to simulate a race. A budget will be put in place to help provide simulation for athletes in preparation for the 2012 games, which will include home country talent development programmes and also will aim to keep longevity in the sport. Interestingly, looking at the line-up in Beijing, the swimmers' ages ranged from women between the ages of 16-35 and men between the ages of 22-35. It is envisaged that within England there will also be regional programmes. This will constitute both Internal (home programme competition) and funding will also be available for External (foreign international competition).

Finally the question of drafting was a topic area that arose and it would appear that there will be 3 swimmers to draft as part of a team in a new event in Europe, something which may be interest in Irish swimming.

**Rob Greenwood Head Coach of the successful and developing club Gallica (modern programme)**

Gallica is based and set up in Lancashire and is the formulation and coming together of no less than 22 clubs to form one major programme called Gallica (and in the last four years Rob as the head coach has started to lead other clubs...)

The discussion was broken up into the following areas: namely

1. Structure of Gallica
2. Philosophies
3. Weekly sets
4. European Juniors – Worlds

1. Structure of Gallica – the founder was Dave Evitts who worked hard to bring together 22 clubs including 3,000 swimmers which were all based no less than 50 miles apart. The club trains out of 15 pools across this district in England. All club structures were in line with LTAD philosophies...and are roughly presented as follows:

- 1 T2Win
- 2
- 3 Club Structures
- Level 4 Learn to Swim

2. Philosophies

These philosophies included... \*max potential\* deliver under pressure\*

They also included the need to build the stroke from “back to front”

Technical training also focuses around holding form under pressure – technique

Person who holds form and is swimming fastest in last 15m is what we want as a club.

Adaptation – change of emphasis and recovery

Speed – every workout

Volume – quality –v- quantity

3. Weekly sets were described and numerous coaching examples were provided with regards to the cycles and weekly plans for swimmers in the top squads taken by Rob at Gallica.

#### 4. European Juniors – Worlds

Rob also covered in detail his plans for every single day leading up to the World youth and onto the European juniors as his swimmers gained some excellent results. A lot of this planning revolved around catering for jet lag and recovery and there was more recognition of swimmers that had put in the work prior to the competitions in the crucial 6-7 weeks as part of the run up to the event.

#### **SATURDAY: Frank Busch Coaching World class sprinters**

Philosophies: Build from the feet to the hands – swim the right way

Arizona – coaches develop great athletes  
Learn to Swim – Fundamentals is important  
Coaches – own unique pathway – do what we do to get what we want  
Understand the big picture – explain to swimmers, so they understand it too...

What is the ceiling on an athlete – we need to make sure they grow as people to make them faster

Weak part is fundamentals and therefore the ceiling for most swimmers is technique

Most individuals in Frank's squad are aged between 18-35 and yet they still concentrate on doing things the right way. Break swimming down to make easy and efficient:

He focuses a lot on flat body, fly legs with kick and a lot of work around the core of swimmers such as fly kick on back as part of training, Snorkels used a lot and fins used all the time –they are useful to teach new things and also to stabilise the body. Ensure that speed feels normal for stroke.

When using the snorkels, Frank often tapes the breathing hole as he feels this makes a real difference and helps to make them more efficient.

Kicking is huge in our sport and he looked at a variety of skills to ensure that the fly and flutter kicks and were a big part of his programme. He also believed that the only way to help your team is to study the best in the world and look at what they are doing and then look to either teach that or better what they are doing!

Frank talked through a range of drills that he uses as part of his programme.....

He challenged the coaches in the room and told them to try to find different and exciting ways of doing things; why do the same thing in the same way?

He uses peer coaching a lot, and allows the swimmers to watch each other and feedback, which helps them develop their knowledge and understanding also.

Limit the use of gimmicks but he did tell the coaches that they needed to be smart in the way in which they use gimmicks with their athletes.

Also be prepared to break down all aspects of our sport to help train them

#### **The LZR swim suit by Speedo. Research manager, Debs Yeoman, @ Speedo, Aqualab, Nottingham**

Results: 72 world records; it is arguably making a huge difference in swimming!

How was this product developed: it was developed by coaches, swimmers and Speedo all feeding in to design the most effective swimming suit. The suit was based around what the athlete needed and required, coach and athlete feedback. A number of prototypes were developed and continued to be developed until the best suit prototype was found and tested.

This is not a fashion suit it is based on not what it looks like, but great suit development.

NASA – was used to do flat plate testing on all materials, a fast fabric I understand is based upon fabric structure. ANSYS systems were also used to look at how the water flows over the body, to identify potential areas of drag, which will need to be most supported in the water. At all times athletes were used as part of the testing. The suit is designed for athletic physiques....!

After scanning of the athletes an interesting fact is that since the 2004 Olympic Games, athletes torsos are getting longer which is why the Long version has been designed in the suit.

Water Flume in Otago, New Zealand was also used as part of testing, as well as the lab based in Nottingham.

The suits were also viewed underwater at the AIS. Eventually the LZR pulse fabric was seen as the most effective fabric for the suit. This fabric is highly compressive, water repellent and chlorine resistant and is a low-drag fabric.

The suit also possesses ultra-thin PU membranes and has a hydro form compression system, optimum streamlining and hydrodynamic shape. The compression system makes them more streamlined.

The seams are ultrasonically welded together which eliminates stitching and then are taped; these seams are stronger than the flat seam. There is also a low profile zip, which is bonded into the suit and the teeth for the zip are on the inside which really reduces the drag; the only cause of drag on the suit is the zip puller.

Internal core stabiliser maintains the good body position and will help core stability muscles; these bands fit on or above the hip bones.

The suit fits globally and there are no customised fits for athletes

There are lots of stats and recommendations for how these suits are measured and sized and these are put on Speedo's website

There is a 30 hour condition with these suits before they lose their repellence in the water; however, this is very much dependent upon how the owner looks after the suit.

There is ongoing debate to ban this suit at a developmental level across swimming, as cost is a very important factor here.

### **Patrick Miley – Hannah Miley's dad, coach and also the man that pioneered the Aqua Pacer. Discussed partnership and the development of their relationship.**

Helicopter pilot and lives in the far corner of Scotland and quite often feels like a long way away from everything... this is a challenge. Discussed his pool environment, the water temperature could range between, 32 and 40 degrees, and is very un-pretty.

“Many of life's failures are people who did not realise how close they were to success when they gave up” (Thomas Edison)

Discussed his own coaching pathway, also discussed his philosophies such as race tough, create the right environment as best as you can and remember to Walk Slowly! Patrick feels it is taking him a long time to learn about the process of coaching.

Race tough and this should be shown in training also.

Every day in training all 4 strokes are covered with Hannah as part of her training.

The focus is always quality and he says that we have to be outstanding when it matters the most.

Hannah would do a 50 week programme and would cover somewhere between 64,000-79,000m per week. The focus would be around intensity and variation. Core training emphasis is also around core skills and flotation, Hannah does a lot of strength and conditioning sessions and Pilates and running which is transferred into the water.

Being at home was 100% positive and supportive and again was seen as a key to her success as the mother was very supportive also.

Planning as a coach – needs to be consistent and flexible.

A lot of time and effort was placed on looking at resting heart rates and variations caused by the interaction of the parasympathetic and sympathetic nervous systems. HR was monitored and this provided Patrick with confidence. In the same respect he also admitted that sometimes the plans were a requirement for him as a coach as opposed to for Hannah as a swimmer.

### **David Marsh: The little things that really make a difference**

Do details matter ? The answer in short = yes!

The finish makes a huge difference – the way in which a swimmer will activate a pressure pad! Can be the difference between gold and silver.

We need to put details into training. So what kind of details were discussed: The finish: changing the order of the relay; this affects the psyche of other teams, to get the finger tips to the wall the fastest in different races, means that you would have to change the neural patterns to get to the wall fastest.

Smaller things should be practised with more senior athletes, but with the younger athletes all you can do at times is do enough to cover the big things! Details such as finishes, starts, and the weight and position on the block, transition on the last 50m of any race, body language as a coach,, attention and respect to the process of learning, more preparation, mental preparation, packing own swimming bags, respecting the system, race plans, drafting, etc...

All little details soon add up.

Determination says a lot about the athlete.

Again, watch the best do it to get better yourself

### **Adam Ruckwood: Rebuilding the City of Birmingham**

Birmingham is the largest council in Europe and is the biggest LA in the UK

The club is an umbrella club, whilst the LA employs, runs and organises the swimming programme.

A lot has gone wrong in Birmingham and a lot has changed. Adam has been in the club a number of years and had some tough times and had to be really determined to make a huge difference in the club.

There are simply two squads: Senior and Junior. In total there are 40 swimmers and 2 coaching staffs.

Where did it go wrong for Birmingham? It was the end of a natural cycle. In 1996, there had been 9,000 kids in learn to swim but in the last 10 years Birmingham has suffered 10 different coaches, which has meant that the club is simply not sustainable. The coach turn over included the jailing of a coach in 2001 and 2002 and also the suspension and resignation of the successor coach in 2004. At this particular time Adam was the development officer and picked up the reins as a coach as well as retaining his development officer's position for the same money to keep the club running.

The changes that Adam made were based upon the following:

Got rid of uncommitted swimmers, locked the doors in the morning, monthly attendance was posted to all parents, there was running total from the start of the year, got rid of individuals not hitting a threshold.

Adam gained a young and developing assistant coach, kids fees were paid hourly, parent and swimmer meetings were introduced and Adam had an open door policy, local club coaches were onsite through communication and sometimes Birmingham's assistant would go out and swap with local coaches to pull them into the programme, a talent ID programme has also been put in place and training weekends which are skills specific have been introduced.

Coaching life balance was addressed and Adam has learnt how to switch off

The programme is coach-driven yet swimmer focused involving swimmers feeding into their programme and compromises within reason. Ties swimmers into accountability. Teaches them good manners, and at all times coaches have to do the right thing by children.

Form under stress is the key

### **Frank Busch: Land Training and Miscellaneous questions**

Activities outside of swimming have become a part of our sport.

Core stability is vital; make everything specific to swimming.

Lots of work in the stadiums, steps, running up and down, run length and up and down on seats.

- Bench Press Ups
- Running up and down soccer stadiums for leg and cardio work

Make the core better, just make kick solid, take time don't rush.

Core is the key....

Frank uses a regular weight programme 3 days a week and this is led by a US Swimming – Physiotherapist which is fantastic and Frank has a lot of interaction and faith in this guy's ability

Focus within Frank's programme:

Run – Strength and endurance  
Dryland – Core  
Weights – Strength and power  
Stadium steps – core athlete movement

Starts: On a track start, an athlete starts with front leg at a 90 degree angle, pulling on the block, elbows tight to the side and arms straight out. Getting them balanced and comfortable on the block is key. Note – line of back, long legs, short torso, short legs, massive torso makes it easier to explode off the blocks.

Age Groups – use fins and snorkels (in freestyle this is not advocated as it flattens them too much)

Frank is a US Team Coach; however, with his coaches and athletes, many of them represent different countries and are on other teams, how difficult is that many kids are not on your team and you can't interact with them? Frank finds this difficult, however builds positive relationships with coaches and other athletes to ensure that he gets feedback and updates. He will ensure that some of his coaching staff will go with individual athletes, and to try and solve this problem at times he has had to turn down opportunities on US Teams.

US is a blessed country; they are in a great situation with great facilities and better programmes and he thinks that places like Britain have to work really hard, and to be as good as they be, they have to think laterally and this has to be continued.

Finally.....Passing comments that are reiterated by all coaches with respect to coaching and their environment are as follows:

**Make swimming FUN at all levels – be innovative (creative), consistent, individual; don't focus on the negatives (work with what you have, don't worry about what you don't have).**

This is by no means all of my notes that I took down, however I felt that I needed to give you all a detailed summary of just some of the things that were discussed at the BSCTA conference, and that I thought may be of interest for you all. For me personally, this year in particular, the BSCTA conference I attended was most informative and I was able to draw a lot of information through the formal lectures but also informally through catching up with friends, former colleagues, and other coaches who have also moved on in their development in the last year.

As a coach, teacher and tutor, but also in my role as the Director of Education, I found that I was able to either reconfirm what I knew, which gave me extra confidence, or was able to pick up extra points that I would be keen to implement within swimming, for which I hope would be for the betterment of our swimmers. I hope that more individuals take up the opportunities of going to these types of events across Europe and the World to better themselves; we all need to keep learning to really make a difference and to stay ahead of our swimmers.

In addition, there are also a variety of other ways that you can improve as an individual working within swimming or sport generally: through writing articles and reports, visiting your coaching colleagues' clubs to share best practice and ideas, to visit external clubs and programmes and to always ask questions. Please contact me if you would like more details or ideas, and I will try my best to help as best as I can.

For any question or further details on this please email me on [education@swimireland.ie](mailto:education@swimireland.ie)

Yours in swimming,

*Charlotte Parker  
Director of Education and Development, Swim Ireland*

# A Review of Recent Literature on the Art of Taper

*Assembled by Larry Laursen, Namibia*

## Components of a Swimming Taper

Houmard, J.A. & Johns, R. A. (1994) Effects of taper on swim performance: practical implications. *Sports Medicine*, 17, 224-232.

This is a review of the physiological factors associated with tapering in swimming.

1. An incremental, stepwise reduction in training volume (>60%) over a period from 10 to 21 days results in an improvement in performance. This contrasts to a minor reduction (<30%) in training volume which appears to maintain performance.
2. Interval training work (>90% VO<sub>2</sub>max), with sufficient recovery between bouts to maximize exercise intensity, is desirable. This may be necessary to maintain training-associated adaptations with the reduction in training volume.
3. Weekly training frequency should be reduced by no more than 50 percent, although it is more conservatively suggested as being 20 percent (a substantial reduction results in loss of "feel" for the water and specific movements). It appears that rapid reductions in training frequency reduce performance rather than improve it.
4. The effects of prolonged tapers have not been examined although it does seem that tapers of longer than 21 days would contribute to performance maintenance rather than improvement.
5. Summary: a successful taper involves a substantial (60-90%) graded reduction in training volume and daily high-intensity interval work over 7 to 21 day period. Training frequency should not be reduced by more than 50 percent although a more conservative reduction would be 20 percent.

## Physiological Effects

1. Improvements in performance during taper occur without changes in VO<sub>2</sub>max. This suggests that the primary physiological changes are likely to be associated with adaptations at the muscular level rather than with oxygen delivery. VO<sub>2</sub>max does not reflect the positive effects of taper in swimmers.
2. Taper does not affect submaximal post-exercise measurements (lactate, pH, bicarbonate, base excess) and heart rate.
3. Blood measures have not been conclusively documented as being related to the taper phenomenon.
4. Although not measured in swimmers, muscle glycogen and oxidative mechanisms have both been observed to increase in tapers.
5. Improvement in power is probably the major factor responsible for the improvement in competitive swimming performance through taper.

## Taper and Performance

1. A 3 percent improvement in performance is the average change that results in swimmers.
2. The first stage of a taper often produces a "bloated" feeling because of extra water retention in the muscles. For every gram of glycogen, 3 gm of water is stored. This often produces a feeling of being heavy or sluggish.
3. Shaving has been shown to have mechanical and consequent physiological benefits.
4. Positive psychology and realistic expectations (i.e., +3%) are very important.

## Time to chill out: a do-it-yourself guide to swim tapering

By Alex Kostich, Active.com

"Time to Taper!"

No three words in the endurance athlete's vocabulary inspire such joy and excitement as the three above.

Tapering is the icing on the cake after a season of hard training: the gradual easing-up of intensity and distance in one's workouts in anticipation of a big race. Timing a taper to align with a personal best performance is a difficult and nerve-wracking task, requiring discipline and a certain amount of restraint (not something endurance athletes are known for!).

A swimmer's taper is different than a runner's or cyclist's in that there is a lot more involved than a decrease in distance per workout. Sprinting, long easy swimming, pulling with partial or full gear, and delicate changes in daily yardage are all components of a successful taper, and even some of the most talented swimmers have trouble with the timing and execution of such a precise plan.

A taper can last anywhere from one to four weeks. Anything less would be considered a few day's rest, and anything more would be pushing your luck in terms of maintaining your peak conditioning. Since no two swimmers are alike, there is no fixed way to taper, but a good place to start is to model your yardage after the 100:75:50 rule.

That is, if a full workout for you is 4,000 yards, then the first week you taper 75 percent of that distance, or 3,000 yards. The next week you taper 50 percent of your full workouts, or 2,000 yards. So the 100:75:50 taper is a two-week taper where you skim down the length of your swims to half of what you were covering initially.

If you feel lethargic a week into your taper, allow yourself a day off completely. Get lots of sleep. Watch what you eat since you are easing up on your training intensity. Under no circumstances should you be in the weight room for the month before your race, even if you have been on a consistent weightlifting program.

Toward the end of your taper you should be sprinting only a few timed sprints at the end of an easy workout, say 4x25's and maybe a 50. Your times for these sprints should be a lot faster than in midseason if you are executing your taper correctly. If they are not, you need more rest.

As a distance swimmer, you should be doing only 3 to 5 x 100's pace and it should feel easy and sustainable. Take plenty of time to swim down after these end-of-workout drills, and you may exit the water only when your heart rate is down to normal active rest.

Taper workouts can involve lots of easy swimming, drills, kicking sets to loosen your legs, and pulling sets with buoy and paddles (do not use a tube as it adds unnecessary weight). Warm-up can be twice as long as your usual warm-up routine, and swim down should be twice as long as well.

That may not leave much yardage for anything else, which is why most tapers can seem like little more than a warm-up and a swim down! The point is to enjoy the opportunity to recover and feel good in the water and put your hard training behind you in preparation for your big race.

During the last week of your taper, you should not need to take a complete day off because you should start feeling fast and smooth in the water. If not, swim easy until your muscles are warmed up, and get out. Try again the next day. Sometimes your body isn't used to all the rest it is getting and as a result you'll feel restless during your bedtime. You may also feel awkward in the water, but don't worry; you do not have to feel terrific until the day of your race.

### **'Rest' Assured**

Tapering also has a mental advantage: You should take the time to enjoy the benefits of resting on your laurels and relax, fully confident that you have done everything necessary to prepare for your race. The hard work is behind you!

Endurance athletes have been known to stress during taper because their work ethic is such that they can not allow themselves the physical break that a taper requires. As a result, they continue training too hard, or they psyche themselves out by fearing losing shape with the rest they are taking. Even a month long taper will not hurt your conditioning if you are an endurance athlete, so rest assured.

## **What is a Taper and What is in It?**

By Allan Williams, Senior Coach, Parkway Swim Club, St. Louis, MO, ASCA Level 2

The word taper in swimming is a word that we all come to know early in our swimming career. A taper is "the reduction of workload during a period immediately prior to

a major competition." As a swimmer goes through their swimming career they may encounter different ways to accomplish a taper. There is no certain way to do a taper, nor a magic formula. One of the most important things that a swimmer must do during a taper, any taper, is to believe in themselves, their abilities, and the work they have done over the course of the season. They must also believe in their coach as a professional with the swimmers best interest always in mind.

The purpose of the taper is to allow the swimmer to adapt to, or supercompensate for, the level of work accomplished in the training program.

An important ingredient of the taper is the work that has gone into swimming before the taper even starts. Tapering allows the swimmer to adapt to perform as the result of regular season training.

The work you do during the season is like money you place in a bank; at the end of the season a swimmer can go to that bank, collect all of his/her money with interest as the pay-off for the hard work done in season. Bottom line, you can get what you put in and more!!

During a taper the work volume can be reduced along with the intensity of work. The frequency of practices and focus during a practice should remain at the same level as the regular season.

The reduction in volume of work will not result in a decreased performance ability. All performance factors are maintained at this important period of time.

In the final stages of a season a positive self image is needed to help create the desire to succeed and have the confidence to do so. Many swimmers may feel as if they are under stress at this time. Mentally or emotionally they may be trying to solve problems that come about during school or training. These problems may be amplified at this time. Parents tread carefully. Sometimes too much motivation or too much anxiety for results, or pressure by parents/coach can come into play in a negative way.

## **Tapering**

Wilmore, J.H., & Costill, D.L. (1988). Training for sport and activity. Chapter 11. Dubuque, IA: Wm C. Brown.

Many coaches fear the loss of conditioning and performance if they reduce training for such a long period [two to three weeks] before a major competition. A number of studies make it clear, however, that this fear is totally unwarranted. (Costill, D.L. (1985). Practical problems in exercise physiology. Research Quarterly, 56, 29-33.)

VO<sub>2</sub>max can be maintained at the training level with a two-thirds reduction in training frequency. It appears that a greater amount of work is needed to increase VO<sub>2</sub>max than to maintain its trained level. The rate of decline in physical conditioning is much slower than the speed with which it can be developed.

## Implication

The most notable change during the taper period is a marked increase in muscular strength. Swimmers demonstrated increases in arm strength and power ranging from 17.7 to 24.6 percent.

## Components of Tapering

By Matthew Coulson

Tapering can be controlled through three variables, (a) frequency of sessions per week, (b) intensity of each session, and (c) the duration of the taper in general. Costill et al (1985; 1991) studied various taper schedules and found that these three variables provided some insight into actual performance improvement.

The first common characteristic with tapering is that training is reduced in an INCREMENTAL fashion as opposed to a general training reduction (e.g., 15,000m per week to 10,000m). Tapering has become the preferred method of the two because, as Costill et al (1991) and Johns et al (1992) demonstrated, muscular power is enhanced and performance improved significantly after 10-21 days taper with competitive swimmers. Houmard et al (1990) demonstrated (with runners) that with a reduction in training volume to 70 percent of normal, 5k race performance or muscular power were not improved. Research thus favours tapered training.

A successful taper should also incorporate a drastic reduction in volume. Tapers that improve swimming performance have been found to consist of 60-90 percent reduction in weekly training volume (Costill et al, 1985, 1991). These positive effects are thought to be primarily mediated by a recovery phenomenon from previous days or weeks of intense training (Houmard, 1991). This recuperation can only occur if training volume is drastically reduced. In distance runners, it was found that a seven-day, 62 percent reduction in weekly training volume did not improve performance, determined by an exercise time to exhaustion test (Sheply et al, 1992). In contrast, a 90 percent reduction in weekly training volume over seven days resulted in a 22 percent extension in time to exhaustion. It therefore appears that a huge reduction in weekly training is required in order to recover and allow the rebound effect to occur.

## Intensity

With regard to the type of training while tapering, it commonly takes the form of interval work, with sufficient recovery in order to maximize exercise intensity (Costill et al, 1991; Johns et al, 1992). Training at an intensity of 70% VO<sub>2</sub>max either maintained or actually worsened performance (McConnell et al, 1993). In contrast, tapers involving training at 90% VO<sub>2</sub>max improved performance (Costill et al, 1985, 1991). The reasons behind this were put forward by Houmard (1991) who said that intense exercise may be necessary to maintain training-associated adaptations with the reduction in training volume during the tapering period. Intense interval work, when coupled with a reduction in training volume, may also provide a unique stimulus to the musculoskeletal system which results in adaptations conducive to improving performance.

## Frequency

Exercise frequency is concerned with the number of sessions performed each week (Houmard and Johns, 1994). The reduction in training volume cannot be achieved at the expense of a drastic reduction in frequency. Neuffer et al (1987) examined the effects of swim-reduced training on swimming power and blood-lactate production after submaximal exercise. Two regimens were examined: (1) 80 percent reduction in training volume, 50 percent in frequency, and (2) 95 percent reduction in volume and 85 percent in training frequency. Results of the study found that swimming power significantly decreased after only seven days and submaximal blood lactate levels increased after 28 days of a reduced-training regimen. These changes were indicative of a loss of training-associated adaptations and, most likely, a decrement in performance. The reduction in training schedules here were quite dramatic. Studies in which performance-related variables were maintained or improved incorporated only a 20-50 percent reduction (Costill et al, 1985; Sheply et al, 1992). Heart rate changes have also been reported by Houmard et al (1989), who found an increase during submaximal exercise in distance runners after a 10-day, 50 percent reduction in training frequency. It can therefore be concluded that weekly training frequency should be reduced by no more than 50 percent during taper. Houmard (1991) actually suggests a reduction of no more than 20 percent. During periods of optimal performance, swimmers often refer to having 'a good feel of the water.' It is this 'feel' that is lost or reduced with too dramatic a reduction in training frequency, and for that reason I would support Houmard's suggestion of no more than 20 percent reduction in frequency.

## Duration

How long should a taper programme last? Yamamoto et al (1988) compared the effects of either a 45-day or a 15-day taper on blood haematocrit and haemoglobin in national class swimmers. They observed that peak performance values were obtained seven days into the taper, and that this would be the optimum taper duration, with anything longer resulting in performance loss. Unfortunately, though, this study didn't measure actual swimming performance. Studies that did involve performance assessment with tapering have reported improvements with tapers lasting from 7-21 days (Costill et al, 1985, 1991; Houmard et al, 1994; Johns et al 1992). However, the effects of a more prolonged taper have not yet been thoroughly investigated, Houmard et al (1992) suggest a taper lasting 21 days would only maintain, rather than improve, actual performance.

## The Physiological Effects of Taper

### Maximal Oxygen Consumption (VO<sub>2</sub>max)

This well-established method has proven to be very reliable in assessing cardiorespiratory fitness levels. It is the maximum amount of oxygen utilized during incremental exercise to exhaustion. It is more commonly produced through treadmill or cycle ergometry but it can be used by swimmers in the actual pool. This is achieved by either tethered swimming where the resistance is incrementally increased, or a free swim at maximal speed with oxygen consumption calculated from expired gases obtained 20-40 seconds post-exercise (Neuffer et al, 1987). With

swimming training, VO<sub>2</sub>max increases quite significantly by some 14-25 percent (Kieres & Plowman, 1991). However, VO<sub>2</sub>max was unchanged with a 21-day taper in nine elite swimmers (Van Handel et al, 1988). Other studies have reported improved performance with taper with VO<sub>2</sub>max remaining unchanged. (Houmard et al, 1994). Alterations in performance which are independent of VO<sub>2</sub>max must therefore be associated with muscular adaptations rather than the oxygen delivery (Sheply et al, 1992). This could be the case with tapering, as muscular power in swimmers has been reported to improve while tapering.

### **Submaximal measures**

Variables commonly used as indices of submaximal exercise efficiency in swimmers include oxygen uptake, heart rate, blood lactate and stroke distance. Costill et al (1991) reported no differences in post-exercise blood balance (lactate, pH and bicarbonate), and heart rate with a 14-day taper. Also, Van Handel et al (1988) reported no significant differences in post-exercise lactate profiles with a 20-day taper. Johns et al (1992) finally reported no alterations in VO<sub>2</sub>max, post-lactate levels and stroke distance with either a 10-day or 14-day taper. In contrast to these stroke-distance findings, Costill et al (1991) reported increases with a taper programme. However, swimmers commonly remove body hair (shave down) before competitions and during taper in order to minimize resistance. Johns et al (1992) actually reported increases in stroke distance as a result of shaving down after 10 days tapering (with no improvements in the other variables).

### **Blood measures**

A restoration of haemoglobin/hematocrit prior to competition is desirable, as it may enhance actual oxygen-carrying capacity and thus performance. Yamamoto et al (1988) reported peak haemoglobin levels after seven days taper. Similar results have also been reported by means of differing tapers (Burke et al, 1982). Elevations in these variables may be associated with a decrease in exercise-induced haemolysis from a reduction in training volume (Houmard et al, 1991). Plasma creatine kinase (CK) level is hypothesized to be positively related to a degree of muscular cellular damage (Noakes, 1985), but quality research is still required to demonstrate this.

### **Skeletal muscle**

Muscle biopsy studies in runners and cyclists have demonstrated a consistent elevation in muscle glycogen (15-35 percent) with tapering. To date there have been no studies on the effects on competitive swimmers when tapering. The finding, though, is important in that the benefits which could be achieved due to the greater availability of energy substrate are vast, since its positive links with endurance performance are commonly accepted (Costill et al, 1991). Sheply et al (1992) also reported increases in oxidative enzymes with taper, providing a huge benefit to endurance performance. It is likely that similar adaptations with taper would occur in swimmers, but nothing has been directly documented.

### **Muscular power**

Costill et al (1991) reported significant improvements in dryland (swim bench) and tethered-swimming power with a 14-day taper. Johns et al (1992) also found gains in tethered-swimming power with a 10- and 14-day taper. As a

result of endurance training, muscular power is decreased because of the residual fatigue or inhibition of neural or intrinsic muscle properties (Dudley & Djamil, 1985). Because of the training elite swimmers undergo (3-4 hours per day, 10,000 per day), muscular power would be expected to reduce. It would appear, though, that sufficient tapering allows restoration of power while maintaining the endurance-related metabolic benefits gained (Houmard & Johns, 1994). The actual ability to exert power is highly related to swimming performance (Costill et al, 1983). It is therefore concluded that the improvement in power with taper is probably the major factor responsible for the improvement in competitive swimming performance (Houmard & Johns, 1994).

### **What about actual swim performances?**

Consistent research suggests that an improvement of 3 percent in swimming performance can be achieved as a result of tapering. Costill et al (1985) compared swim performance during normal training and with a 14-day taper. Swimming performance in all strokes improved by an average of 3.1 percent with tapering. Similar results were reported again by Costill et al (1990), who assessed performance after two tapers in the same competitive season. Johns et al (1992) also demonstrated a 3 percent improvement after a 10- and 14-day taper programme in swimmers over a variety of distances and strokes. And we mustn't forget the shaving down carried out by swimmers, which could also have affected performances (Sharp et al, 1988).

In order to produce the best possible results from tapering, both coaches and swimmers need to be aware of the following factors:

1. The awkward feeling associated with the first few days of tapering.
2. The individuality of the taper process (this is an ABSOLUTELY VITAL consideration). Every athlete will respond to taper differently, so communication between coach and swimmer is of the utmost importance.
3. Mini-tapers and retapers (throughout the season for more than one competition).
4. Shaving and mental preparation.
5. Realistic estimation of performance goals.

### **Conclusions**

When planning any form of tapering programme I would recommend the following points. The training incorporated into the programme should be reduced in an incremental fashion with a 60-90 percent reduction in training volume. Training intensities should take the form of high interval work (90% VO<sub>2</sub>max) with sufficient rest between sets. The frequency of training should be reduced by no more than 20 percent in order for the swimmers to maintain their 'feel' of the water, and, finally, duration of the taper programme should be decided on an individual basis (because of varying responses to tapers) and last between seven and 21 days.

## Maximize Performance Through

### Resting – The Taper

From Kevin Koskella, TriSwimCoach

Training is an important part of any athlete's race preparation, but resting to maximize performance can be a challenge. Discover how to make the most of this final crucial phase of training.

Most people train for months and forget that 2 weeks before the race it's time to think about resting.

Here are some things for people to keep in mind during the "rest period" before a race:

- Do longer warm-ups and warm-downs. You can keep your distance up, but start to add more to the beginning and end portion of your workout. This 'active rest' will assure that you are well rested for your race but not out of shape.
- Avoid big meals and sugar. Tapering is an adjustment for your body, and your immune system. Big meals and carbohydrates like sugar will wear down your immune system and leave you susceptible to colds and flus. Keep in mind that as your workout intensity decreases, you must decrease calorie intake accordingly.
- Get as much sleep as you can before midnight. Ideally, get to bed by 10:30. The sleep you get before midnight is the most crucial to your recovery. You will feel more rested if you can do this for at least 2 weeks before your event.
- Lay off the strength training. This is more of an individual call (some people feel better if they are doing some strength work all the way up until the event, others will be too broken down unless they take a good 2 weeks off), but at the minimum, you should go lighter in the weeks leading up to your event.
- Avoid caffeine. It may be tough if you are a coffee addict, but 2 weeks of not having that morning cup will give you more natural energy for your race.
- Increase your meditation or yoga. Less time working out means more time to prepare mentally! If you don't do yoga already, don't start now. However, find some quiet time during the day to get away from work and working out to clear your mind.
- You will have more energy during your rest or taper period. Don't be tempted to use it! Save it for your event and you will be glad you did.

Scientific studies have shown that 'tapering' – reducing one's training for one to three weeks prior to competition – can produce dramatic improvements in performance but haven't been sure exactly why this is so. Now, recent research shows that tapering boosts competitive efforts by increasing the elasticity of muscles, or, more precisely, by enhancing the way in which muscles use 'stored elastic energy.'

('Effects of Taper on Stored Elastic energy in Adolescent Swimmers,' Medicine and Science in

Sports and Exercise, vol. 27(5), Supplement, no. 510, p. S90, 1995)

'Stored elastic energy' may sound like a mouthful, but it's easy to understand. When a muscle is stretched (as it usually is before it contracts), it contains more energy than it does when it's non-stretched, just as the rubbery part of a catapult contains more energy – and can hurl an object faster and farther – when it is in the fully stretched position. This energy which is stored in a muscle is extremely useful to the athlete, because it helps the muscle shorten (contract) powerfully without the need to burn up further energy.

#### Boosting power, saving energy

The way in which the energy put into a stretched muscle is used to produce raw power or a more puissant swimming stroke – is simply called the utilization of stored elastic energy (USEE). The better the utilization, the more powerful and efficient the athlete.

At the University of Puerto Rico, 29 young swimmers undertook a 21-day taper. USEE was evaluated four times: before the taper began, at the end of seven days of tapering, after 14 days, and again following the full 21 days of tapering. Interestingly enough, USEE actually decreased by about 25 percent after seven days of tapering, indicating that a seven-day taper was too short.

#### Best after 21 days – or longer?

However, compared to the beginning of the tapering period, USEE had risen by about 17 percent after 14 days of tapering (and by about 55 percent compared to one week earlier). By far the best tapering period for enhancing USEE, though was the 21-day taper, which bolstered USEE by an amazing 125 percent.

Why did tapering upgrade USEE? Probably the swimmers' muscles were sore and stiff following their regular training, and this stiffness interfered with optimal USEE. It apparently took at least 14 days of tapering for muscles to recover enough so that USEE could improve, but the true mega-move in USEE took a total of 21 days (there was no word on whether USEE might improve even more with an even longer taper).

The implications of the research are clear: one reason that the strategy of tapering works is that it makes it possible for muscles to optimize their USEE, although it seems to take at least 21 days for this optimization to work in swimmers.

Tapering does lots of other useful things too, such as:

- Boosting carbohydrate levels in muscles
- Hiking blood volume
- Creating augmented levels of aerobic enzymes inside muscles
- Speeding muscle repair
- Endurance athletes should remember that the more difficult their training has been, the longer and more dramatic should be their taper.
- Athletes who have engaged in fairly strenuous training probably need at least three weeks of tapering prior to competition.
- Heavy-duty marathon training makes at least a one-month tapering period necessary. ■

# Upcoming Coaches Clinics

## 2009 ASCA World Clinic

Fort Lauderdale, FL, USA  
(Harbor Beach Marriott)  
September 8-13, 2009

## dvs-Symposium “Biomechanische Leistungsdiagnostik im Schwimmen”

[Symposium on Biomechanics in Swimming]

Leipzig, Germany  
September 10-12, 2009

## 46th Annual BSCTA Swimming Coaches Conference

Cheltenham, Gloucestershire, England, UK  
(The Thistle Hotel--Cheltenham)  
September 25-27, 2009

## DSTV Clinic 2010

[German Swimming Coaches Association annual clinic]

Weiskirchen, Saarland, Germany  
April 30- May 2, 2010

## WSCA Gold Medal Clinic 2010

[hosted by the American Swimming Coaches Association]

Indianapolis, IN, USA  
(in conjunction with the 2010 ASCA World Clinic)  
September 2-4, 2010

## XI International Symposium on Biomechanics & Medicine in Swimming

Oslo, Norway  
September 2010