

AUSTRALIAN MASTERS SWIMMING COACHES NEWSLETTER

NATIONAL OFFICE

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EDITORIAL

Hello readers,

I hope you all had a stress free Easter. Just enough time to eat a few easter eggs and drink a few beers (wine), but not long enough to lose too much fitness. By now it is probably only a distant memory. I hope the dedication is paying off and those personal times are getting faster and faster, if not, then I hope the social side of masters is getting better and better!

My apologies to the author of the article below. Please let me know if you wrote it so I can acknowledge in the next issue. Thank you to Max the Man Kavanagh for his regular physio update.

I'd love to receive more e-mails, in particular, articles I can use in this newsletter. Please e-mail to tma@cqu.edu.au. Happy reading.

Claire Reaburn

THIS ISSUE

FEEDBACK AND MOTIVATIONAL TOOLS	1
THE QUALITY OF RECOVERY	2
AN OVERVIEW OF THE BASICS OF TECHNIQUE FOR ALL STROKES	3
PHYSIO FACTS	4
TRAIN YOURSELF TO BE A 6 SPEED SWIMMING MACHINE	5
COACH EMMANUEL VERGE'	6
MENOPAUSE AND THE FEMALE MASTERS ATHLETE	7
DATES TO REMEMBER	8

FEEDBACK & MOTIVATIONAL TOOLS

Here is a great tip for setting those goals at the start of the season and seeing how you are progressing and meeting them. The following tips come from Bill Sweetenham.

Fins: (Diagram to the right is a flipper-use your imagination)
Using long fins, find a short pair of fins and in permanent marker draw a line on the long fins that is the length of the short fins. This line indicates the main PB goal time (choose your stroke and distance) you wish to achieve by the end of the season. Write the date and time on the line. Now work out when you should realistically be able to achieve small increments in time that will lead to this achievement. Dates and times can be recorded by drawing lines across the fins as a type of calendar. When you meet the time you have set yourself, cut the upper section off the fins. Not only have you achieved the next step in your progress to the seasonal PB, but you will have to work harder to get to the next point (as there is less fin to use)

Kickboard: (Diagram to the right is a kickboard)
A similar motivational and feedback method can be achieved using a kickboard. The top of the board represents the time you're on now; the bottom of the board is your goal time. Lines are drawn across the board with dates of time trials or meets at which you hope to achieve a time. This breaks down the seasonal goal into smaller parts. It also gives you feedback and makes the goal more achievable. You can actually see the progress you have made while you are swimming (kicking) and can focus on achieving the next stage or time.

HEART RATE SET:

This a great set to do on a regular basis ie every 1-2 weeks to see improvement. Not only will you get to see your times improve, but you will get to know the pace you are swimming at. For a start:

HRmax = 220 - age in years (approx.)

BBM = Beats Below Max

For an easy estimation using any finger (not thumb) find the pulse in your carotid artery - in your neck. Starting with the count of 'zero' count the number of beats over 6 seconds. Add a '0' and you have a basic HR for a minute (60 seconds). HR needs to be taken after each 100. Know what HR you are aiming for before you start the set.

AFTER YOUR WARM-UP

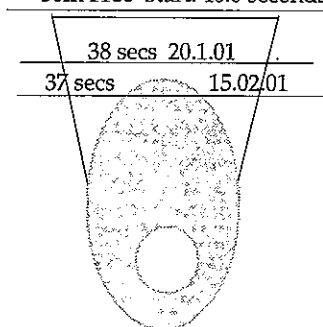
4 x 100m Freestyle @ 2.30,	40 BBM,	200m easy	active recovery
3 x 100m Freestyle @ 2.15,	30BBM,	200m easy	active recovery
2 x 100m Freestyle @ 2.00,	20BBM,	200m easy	active recovery

Follow this with a swim down of approx. 1km at about 65% of the effort you have put into the previous set for optimal lactic acid removal (will prevent stiffness).

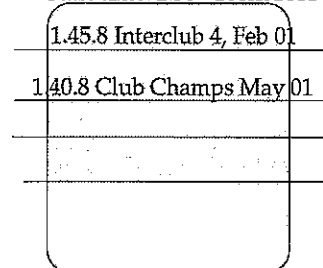
Good luck and remember as you improve you can increase the number of 100m in each set.

This was sent to me via e-mail and unfortunately I somehow didn't note the author. My apologies. Please let me know and I'll acknowledge in the next newsletter.

50m Free Start: 40.0 seconds



Start time: 1.50 - 100m Free



Goal Time: 1.30.00 Honda Oct 01

THE QUALITY OF RECOVERY

BY SCOTT RABALAIS

DURING A TYPICAL WORKDAY, AN EMPLOYEE MAY TAKE A FEW SHORT BREAKS TO RESTORE ENERGY LEVELS AND TAKE A STEP BACK FROM PRESSING MATTERS. STUDENTS ENJOY EXTENDED HOLIDAYS FROM THE ACADEMIC GRIND TO REST THEIR TAXED MINDS. AND VIRTUALLY EVERYONE TAKES AT LEAST A FEW DAYS EACH YEAR TO HEAD FOR THE BEACH --OR THEIR FAVOURITE VACATION DESTINATION.

Just as with working, studying or keeping up with the often frenetic pace of life, swimming can place high demands on an individual physically, mentally and emotionally. From the occasional lap swimmer to the elite competitor, every swimmer at one time or another feels a sense of fatigue from his or her investment of energy. It is obvious that a swimmer needs recovery time to replenish energy stores so that the mind and body can be restored to a stronger state. An athlete does not become faster, quicker and stronger by training only, but by the combination of training and recovery.

What may not be so obvious is the rest required at various levels - from the restful recovery in each stroke to the long-term periods of decreased activity. Evaluate yourself on each level and decide where you can increase the quality of your recovery.

STROKES

Each of the four strokes has the active and passive, the on and off, the work and rest. Generally speaking, the recovery phase of the stroke is an opportunity for us to relax following an active, propulsive action. For example, in freestyle, the more passive part of the stroke is the recovery, which may be described as the over-water aspect of the arm stroke where the hand and arm move from

the lower extended position to the upper extended position. While both the over- and under-water phases of the stroke require an expenditure of energy, the under-water phase is considerably more taxing. The more relaxed and restful the recovery phase, the more effective will be the underwater work.

Pay attention to your backstroke, breaststroke and butterfly, and determine those positions in your strokes that demand a relaxed

state. Aim to swim faster simply by improving your relaxation abilities in recovery phases. Not only does this apply to the arm stroke, but to the kick, starts and turns as well.

SETS

Virtually all workout swimmers tackle challenging sets on a regular basis. How many times have your lane mates finished a repeat and talked during the entire brief rest period? Not to advocate anti-social behavior, but it is difficult to allow the breathing rate to decrease while one is chatting away. Stay at ease between repeats and sets and you'll have more productive practices.

WORKOUTS

While the average Masters swimmer takes to the pool two to three times per week, those who train on a daily basis should find the need for an occasional day off to restore the inner batteries. Swimmers new to exercise routine may find they need more recovery than the seasoned swimmer. On the other hand, experienced swimmers who apply themselves wholeheartedly in a practice with race-pace efforts may find the need at times for more rest than the casual swimmer.

CYCLES

Is your training geared towards peak performances at a specific meet? Some swimmers adhere to a cycle plan, whereby, for example, they may train with intensity for three weeks and then swim easily through a recovery week. The recovery week is "active rest", or swimming at such a pace to actually allow the swimmer to feel restored for another active three-week cycle.

SEASONS

After a swimmer participates in a championship meet at the end of a short course or long course season, it is recommended that a rest period be taken not only to allow for physical recovery, but also to allow for some evaluation and establishment of goals for the next season. The beginning of a new season is also an opportunity to begin re-building an aerobic foundation or to start a strength program.

YEARS

The most dedicated and active Masters swimmers can remain in the pool year after year, or even decade after decade. With Masters swimming approaching 30 years as an organised sport, there are those who have been training and competing for three decades - and more! Interestingly, Masters

swimming is a sport that is not seasonal in that it runs nearly 365 days a year. Perhaps masters swimmers should take at least a couple of weeks each year when they are totally removed from the sport and take up another activity.

UNEXPECTED BREAKS

Life has a way of imposing its own breaks on our swimming routine. Perhaps we have to attend our child's soccer games two days a week, or the pool water turns green and the facility shuts down for two weeks. We experience pain in our shoulder and the doctor recommends no swimming until it ceases. The boss sends us on a business trip to New Guinea for three weeks, and no pools are available.

Do not fight the breaks, but use them as opportunities to rest and change your focus. If a pool is not available, try walking, running, cycling, aerobics or basketball.

THE EFFECTS OF AGING

While research in this area is still sparse, it is evident that as we age, we require a longer period for recovery from strenuous exercise than we were younger. Those who have swum over a long term, say, since childhood and into their 50s, have no doubt realised that they do not bounce back from intense swimming as quickly as they did in their youth. While the level of performance may not diminish much over a couple of decades, the rest needed between high levels of performance and training is likely to increase.

THE QUALITY OF RECOVERY

Not only is the quantity of rest important in various levels of our swimming, the quality of rest is equally important. As students should not labor over their books between semesters and employees should not take their laptops on the beach, swimmers should take time to be as ease away from the pool. Remember that to reach great peaks of activity, there must be deep valleys of rest.

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"DO NOT FIGHT THE BREAKS, BUT USE THEM AS OPPORTUNITIES TO REST AND CHANGE YOUR FOCUS. IF A POOL IS NOT AVAILABLE, TRY WALKING, RUNNING, CYCLING, AEROBICS OR BASKETBALL."

"IT IS OBVIOUS THAT A SWIMMER NEEDS RECOVERY TIME TO REPLENISH ENERGY STORES SO THAT THE MIND AND BODY CAN BE RESTORED TO A STRONGER STATE. AN ATHLETE DOES NOT BECOME FASTER, QUICKER AND STRONGER BY TRAINING ONLY, BUT BY THE COMBINATION OF TRAINING AND RECOVERY."



AN OVERVIEW OF THE BASICS OF TECHNIQUE FOR ALL STROKES (PLUS A BIT EXTRA) AND SPECIFIC TRAINING NEEDS.

By MATTHEW COULSON

THE EFFICIENCY OF YOUR SWIMMING STROKE IS THE KEY TO SUCCESS AS A COMPETING OR TRAINING SWIMMER. AN EFFICIENT STROKE WILL SIGNIFICANTLY REDUCE WASTED ENERGY OUTPUT THROUGH LESS DRAG IN THE WATER AND A CLEANER EXECUTION OF HAND AND ARM ENTRY AND RECOVERY. THUS THAT LITTLE EXTRA ENERGY MAY PROVIDE YOU WITH AN OVERALL FASTER TIME. WHEN YOUR ENERGY RESOURCES ARE DEPLETED AND YOU'RE HANGING ON TO THE END OF THE RACE, YOU WILL BE THE WINNER IF YOU CAN HOLD YOUR TECHNIQUE TO THAT LAST TENTH OF A SECOND. EVERY SWIMMER KNOWS HOW EASY IT IS TO LET ONE'S TECHNIQUE DROP OFF AS YOU BECOME MORE FATIGUED THROUGHOUT A RACE, - THAT BURNING SENSATION IN THE SHOULDERS AS YOU TRY TO HOLD TOGETHER YOUR LAST FEW STROKES TO THE WALL IS THE HARDEST PART OF THE RACE.

With regard to training for competitions, the season can last for up to 10 months or more, depending on whether you are at county, national or international level. In general, the season's training will reflect the level of the club or squad you are training with. The season will be geared towards the county or regional championships, the Grand prix circuit, the nation short and long course championships, the European, World or Olympic games or the World Cup Circuit. Whatever your level, this article aims to cover the different types of training sets/sessions you should experience. Your individual ability and/or standard will determine the actual proportional breakdown of these sessions or cycles throughout the swimming season.

TECHNIQUE

When considering swimming technique for any stroke, analysis should follow the format described below, in this order:

1. Leg kick
2. Arm cycle
3. Timing
4. Breathing

The leg kick will control the body position in the water, while the arm cycle will provide the propulsive force. The timing between the two is vital to the efficiency of the given stroke in order to provide a greater speed through the water with minimum wasted energy. Finally, breathing technique should be analysed to ensure that when you breathe your overall technique

is not disrupted in any way that would cause a breakdown in efficiency.

Freestyle

The main propulsive force of the freestyle stroke is the arm cycle. The legs add only 10% of total speed through the water, depending on whether you use a 2-, 4-, or 8-beat kick. The main function of the legs is to help keep the body balanced and efficient to allow the arms to do their work and keep the body moving when the arm cycle is at its weakest point.

Recovery

Elbow leaves the water first, with a high elbow, hand relaxed directly under the elbow, trailing fingers on the water, then reach forwards to the entry position.

Entry and Catch

Thumb first, hand slightly cupped, reach further forwards and out (laterally) to 'catch' the water to prepare for the out sweep - dropping the shoulder (upon the reach) slightly will help in the 'catch' and also in the recovery of the other arm.

WHEN CONSIDERING SWIMMING TECHNIQUE FOR ANY STROKE, ANALYSIS SHOULD FOLLOW THE FORMAT DESCRIBED BELOW, IN THIS ORDER:

1. LEG KICK
2. ARM CYCLE
3. TIMING
4. BREATHING



Out sweep

Press the water laterally to the body with only slight elbow flexion and begin to rotate the hand at the wrist medially.

In sweep

Press the water towards the hips through further flexion of the elbow and wrist as you feel the body being pulled over the hand.

Press

With the hand at the hip and palm facing towards the feet, press the water back by extending the arm to approximately 90% of full extension, keeping in line with the body to reduce drag. The arm is ready for the recovery, elbow first.

Backstroke

Because of the required shoulder roll during backstroke swimming and a slightly weaker arm cycle, the legs play a more important part in adding a propulsive force to the stroke. The key, however, is to ensure that the feet work just under the water surface and not above it, to endure that the full kicking movement is propulsive and not against thin air. The arm cycle is described as follows.

Recovery

Thumb first, arm fully extended, rotate the arm laterally through the shoulder joint, keeping in line with the body, gradually turning the hand laterally at the wrist ready for the entry. Allowing the opposite shoulder to drop will lift the recovery shoulder to help balance the stroke and create a more powerful propulsive phase.

Entry and Catch

Little finger first, drop the shoulder to allow a reach and 'catch' the water with the hand cupped. The arm should flex slightly at the elbow to assist in the catch.

Down sweep

Continue to flex the arm at the elbow as you press laterally, then downwards as you pull the hand towards the shoulder and chest, keeping that shoulder in the drop position.

Press

With the arm close to the body, press the water towards the feet in line with the body, ensuring full arm extension is achieved.

Butterfly

This is a stroke where timing of the kick and the arm cycle are paramount. An inadequate butterfly technique can waste a huge amount of energy because of the double arm movement on recovery and propulsion, and also the double leg kick. Practice makes perfect, and the more efficient you can make this stroke the more power you will be able to generate where it is needed. The arm cycle is as follows:

Recovery

Both arms break the water simultaneously, hand and forearms first, the arms swing outwards, elbows slightly flexed as they both continue to swing round and meet forward of the head, thumb and fingers first.

Entry and Catch

Fingers first, the hands cup and catch the water simultaneously in preparation for the out sweep (the big kick finishes).

Out sweep

Together, the arms press laterally, and the arm begins to flex at the elbow (the small kick starts).

In sweep

As the arms continue to flex, the hands turn medially and press towards the body (in small kick finishes).

Press

As the hands come close to the body, they then press towards the feet, fully extending the arms at the elbow in preparation for the quick 'flick' out of the water and to recovery (the big kick starts).

Breaststroke

The final competitive swimming stroke to analyse is, like butterfly, controlled by the efficient timing of the leg kick and arm cycle in order to give the most effective end result - a faster swim! The arm cycle is as follows:

Continued on page 4

Overview of the Basics of Technique for all Strokes cont'd from page 3

Reach and Glide

Both hands, thumbs together; reach forward, fully extending the arm at the elbow (the leg kick starts to push back to continue the forward movement) – the arms will stay in this position until the kick is completed by the feet touching.

Out Sweep

The hands rotate laterally, cupped to catch the water, and press laterally with slight flexion of the arm at the elbow.

In Sweep

The arms continue to flex at the elbow as the press on the water is now turned medially towards the chest (the legs flex at the knee and hips to prepare for the kick).

Recovery

Once at the chest, the hands meet in the centre, elbows flexed close to the chest to reduce drag, and recover together over the water at the beginning, but then dive in to the reach and glide.

TRAINING SETS/SESSIONS

Depending on which training cycle you are in, you will often cover varying sessions on endurance/stamina work and speed/power work. There are hundreds of different swim sets you could carry out through a certain training cycle. Below are examples of what to include in those sessions, at what intensity, and how much rest should be given. These examples are to be used as a 'main set' for a single training session. A quality warm-up and 'lead-in' set should be completed first, followed by a recovery set and cool-down, depending on the length of the sessions, training cycle, etc.

Endurance

Any competitive swimmer (or serious health-club swimmer) must incorporate this type of training throughout their season or given cycle. This will build their physiological aerobic base from which to develop more specifically for their needs, whether it be simply fitness or distance-based swims (400m or 1500m) or sprint-based swims (50m or 100m).

Basic Endurance

This involves working at a heart-rate level of 65-75% HR max for a period of 15-60 minutes. Rest within the sets should be between 10-30 seconds depending on the distance repeats you are swimming. Examples include:

20 x 100m repeats	10-15 sec
RI 60-75% HR max (2000m)	
5 x 400m repeats	20-25 sec
RI 60-75% HR max (2000m)	
(RI = Rest interval)	

Threshold endurance

This involves working at a heart rate level of 80-85% HR max, for a period of 15-45 minutes. Rest within the sets should be between 10-30 seconds depending on the distance repeats you are swimming. Examples include:

10 x 200m repeats	15 sec
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RI 80-85% HR max (2000m)

Overload endurance

Occasional endurance sets should involve this type of training, whereby you swim at a heart rate level of 85-90% HR max for a period of 15-30 minutes. Rest intervals within the set should be no longer than 30 seconds depending on the distance repeats you are swimming. The main aim of this type of training is to work for a solid length of time at a high intensity with little rest to ensure the working muscle groups achieve overload. As you know, without achieving overload, progression will not occur within a given time scale. Examples include:

5 x 200m repeats	15secs
RI 85-90% HR max	
10 x 100m repeats	10secs
RI 80-85% HR max (overall 2000m)	
3 x 400m repeats	20-25secs
RI 85-90% HR max	
4 x 300m repeats	15-20secs
RI 85-90 % HR max (overall 2400m)	

Sprint

Sprint training adds the anaerobic fitness base to the aerobic base you have developed with your endurance training. It works on the two anaerobic energy systems – the creatine phosphate energy system and the lactate energy system. Training involves short, fast repeats with good rest intervals to ensure you can overload both these energy systems. The additional benefit of sprint training is muscle adaptation to the speed-type exercise, as well as the aerobic benefits trained earlier. Working the fast-twitch muscle fibres will increase their number and size in a given muscle as well as the speed of excitation. The following examples of training sets are to be used as a 'main set' as with the previous endurance examples.

Lactate tolerance

This involves working at a heart rate level of 90-95% HR max, with substantial rest periods within the given set. The aim is to work close to maximum speed and then to rest (for between 3 and 5 minutes) in order to give time for some lactate to be broken down and eliminated. Examples include:

6 x 50m repeats	4mins
RI Maximum pace	
4 x 100m repeats	5mins
RI Maximum pace	

Lactate production

The aim of this type of set is also to exercise at close to maximum but with less rest (between 1 and 3 minutes) in order for your body to experience exercising with lactate build-up in your system. This therefore involves working at a heart rate level of 90-95% HR max. Examples include:

10 x 50m repeats	1 min
RI Maximum pace	
6 x 100m repeats	2min
RI Maximum pace	

One final area of a training session is swimming 'drills'. The aim is to slow the stroke down and to concentrate on and practice the key areas of technique, whether it be

the high area recovery on freestyle, the symmetrical arm cycle of the butterfly, the timing of the kick and pull on breaststroke, or the shoulder roll on the backstroke arm cycle. These can form part of the warm-up or lead-in set or even the recovery set.

More specific work can be done with the use of a float and a pull buoy. For example, kicking drills with or without flippers/ with or without a float, speed or endurance kick sets depending on your current training cycle. Pulling sets can work very well on technique, endurance as well as power development in the arm cycle. Again, these sets could be used as part of the warm-up, lead-in set or recovery set.

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Physio Facts

BY MAX (THE MASTER)

KAVANAGH

Studies have shown that swimming injuries present as overuse in nature and related to strokes. 30% shoulder injuries (from F/S, B/fly), 30% knee (from Br/s), 30% calf/foot and 10% other areas.

Whilst I have not seen studies for Masters Swimmers, it is my experience that the injury proportions shift more to the neck and shoulder.

Should a shoulder injury occur (after the resting and icing regime initially) it is important to diagnose the injury.

The impingement or pinching of tissues (usually the rotator cuff tendons) can produce a swelling and later scarring (called tendonitis) or it can be a tear.

Coaches may find modifications to shorten stroke length and increase body rotation, may avoid aggravation with impingement injuries. This can allow swimmers to continue training while they address the contributing factors I've discussed before. However, if a tear has occurred then Coaches will find the swimmers pain will not be relieved by modifying things and it is extremely important not to keep aggravating the injury.

Tendons have relatively poor blood supply and are therefore slow healing, so minimising the damage will allow quicker and more successful rehabilitation.

Persisting and recurring pains should be assessed by sports physio or doctor and not allowed to progress to more serious and complicated injuries.

Other injuries next time.

Move well. Stay well.

Max Kavanagh.



TRAIN YOURSELF TO BE A 6-SPEED SWIMMING MACHINE

By DOUG HUESTIS

YOUR BEST SWIMMING WILL RESULT FROM ADEQUATE TRAINING OF THE FOLLOWING THREE ENERGY SYSTEMS: AEROBIC TRAINING, ANAEROBIC TRAINING AND SPEED OR POWER TRAINING."

In its simplest form, swimming involves the repeated contraction of the muscles used to propel you through the water. Your muscles need a constant supply of energy for propulsion. This energy is supplied by the breakdown of adenosine triphosphate (ATP), which is a chemical stored in all muscle cells.

ATP is replaced by two other chemicals found in the muscle cells: creatine phosphate (CP) and glycogen. ATP and CP are known as the "high energy phosphates." Their breakdown releases a lot of usable energy for forceful muscle contractions.

However, the energy they release comes at a cost. This cost is called rapid depletion. After the first 10-12 seconds, the body must turn to another energy pathway to continue at high rates of speed.

The next most rapid source of ATP replacement is called anaerobic metabolism, which is the breakdown of glycogen to lactic acid. The downside of this chemical reaction is that it involves several other chemical reactions, which slow down the replacement of ATP, resulting in a loss of swimming speed. The other, more familiar result is that through the accumulation of lactic acid, blood pH drops, becoming more acidic, interfering with effective muscle contractions and producing the well-known "lactate burn."

The last method of ATP replacement used by the body is the process of turning to aerobic metabolism to replace muscle ATP stores through the breakdown of glycogen to carbon dioxide and water. While this chemical process is slower than the others - resulting in slower sustainable swimming speeds - it is the most efficient and economical method of replacing ATP molecules. Aerobic metabolism not only generates many more ATP molecules, but it does so with minimal accumulation of lactic acid.

THE THREE BASIC FORMS OF TRAINING

The preceding information suggest that your best swimming will result from adequate training of the following three energy systems:

⇒ **AEROBIC TRAINING IS THE FOUNDATION FOR THE TWO OTHER FORMS OF TRAINING. IT ALLOWS YOU TO DEVELOP THE FASTEST, MOST EFFICIENT PACE DURING THE MIDDLE OF YOUR RACES.**

⇒ **ANAEROBIC TRAINING ENABLES YOU TO FINISH RACES FASTER. EFFECTIVE ANAEROBIC TRAINING ALLOWS YOU TO SHIFT GEARS AND SPRINT TO THE WALL AT THE END OF YOUR RACE.**

⇒ **SPEED OR POWER TRAINING ALLOWS YOU TO BE ABLE TO START YOUR RACES FASTER AND GENERATE MORE POWERFUL STARTS AND TURNS.**

AEROBIC TRAINING

Aerobic training enables the swimmer to achieve the fastest possible pace without experiencing the accumulation of lactic acid. The bulk of training should be somewhere between the aerobic threshold and anaerobic threshold.

"AEROBIC TRAINING ENABLES THE SWIMMER TO ACHIEVE THE FASTEST POSSIBLE PACE WITHOUT EXPERIENCING THE ACCUMULATION OF LACTIC ACID."

Aerobic threshold is the minimal training speed that contributes to the improvement in aerobic endurance. Anaerobic threshold is the maximum aerobic speed.

For maximal adaptation, include some swims stressing the aerobic metabolism. These would be swims of a maximum aerobic effort (see Chart 1).

There are three types of aerobic training: anaerobic threshold, cruise speed and maximum aerobic effort.

Anaerobic threshold training (sometimes called AT pace training) is the pace a swimmer would apply when doing the USMS One Hour Swim. Interestingly, swimming at speeds well in excess of this speed have been found to be less effective in creating maximal aerobic endurance capacities. This factor is of particular importance to some excessively goal-driven Masters swimmers and quite a few triathletes. Due to the rapid influx of lactic acid inhibiting the adaptation of aerobic metabolism, if you do much of your training faster than your AT, you could end up with inefficient and ineffectual training of both the aerobic and anaerobic energy systems.

Cruise speed training is a level of effort useful for days when you need rest. To be effective, it needs to be at a level just above your aerobic threshold, usually at about 70 to 75 percent of maximum. Efforts are moderate, and you should feel as if you can pick up the pace at any time. This type of training is invaluable for energy replacement, and it is essentially the "backing and filling" of your aerobic conditioning.

Maximum aerobic effort is necessary to push your aerobic conditioning to the highest levels. However, it is stressful to the system due to the large amount of lactic acid production associated with a significant amount of muscle glycogen depletion. Due to the demands of this type of training, it should account for no more than 20 percent of your aerobic distance training.

Here's how to make a quick determination of your aerobic energy system: calculate 60 percent of your personal maximum heart rate, then do a maximum aerobic type main set. (To calculate your maximum heart rate, subtract your age from 210 if you're in good shape or from 220 if you're not yet in good shape.)

If your heart rate averages a drop from near maximum to below 60 percent in less than 30 seconds after each swim, your aerobic energy systems are probably maximized. In this case, it would be more productive to spend more time on race specific training. Use anaerobic threshold and maximum aerobic effort sets only to maintain your level of aerobic conditioning.

If your heart rate averages a drop from near maximum to the 60 percent level in 30 to 60 seconds after each swim, you need to work on improving your aerobic conditioning. Use AT pace training sets, such as 20 x 100 free with 10 seconds rest. Even, fast-paced swimming is a good way to test and monitor positive shifts in your anaerobic threshold.

If your heart rate takes more than one minute to drop to the 60 percent level, you need to work on basic aerobic conditioning. In this scenario, it would be counter-productive to try to do maximum aerobic training sets. The bulk of all your training should be between cruise speed and AT pace mode, and high intensity anaerobic training should be minimal.

ANAEROBIC TRAINING

When done properly, anaerobic training can yield big dividends because you are essentially training your body to deal with the discomfort of increased levels of lactic acid and the resultant drop in muscle pH. You can train your body to increase the production of lactic acid. It is actually an energy source. Additionally, you can enhance your ability to re-synthesize lactates and buffer lactates (just as Tums works on stomach acid).

If you can train your body to produce lactic acid faster, in larger quantities, while also buffering and clearing it out of the working muscles more efficiently, you should be able to sprint longer and faster at the end of your race. Moderation is the key. Do not attempt to do all forms of anaerobic training

Train Yourself to Be a 6-Speed Swimming Machine cont'd from page 5

on a daily basis. Not only will it become counterproductive, but it could be dangerous, especially if you have not built up a solid aerobic foundation.

There are two types of anaerobic training: anaerobic endurance training and anaerobic power training.

The emphasis of anaerobic endurance training is facilitating the production of lactic acid by swimming fast repeats with short rest, approaching the maximum heart rate. Broken swims are one variation of this form of training. This type of set not only helps enhance your lactate tolerance, but it helps fine-tune your pacing skills. Anaerobic power training increases the ability to buffer and re-synthesize lactic acid. Swim short, fast repeats followed by short recovery swim (see Chart 2).

SPEED TRAINING

Speed training is meant to help you improve your ability to start races faster and more efficiently. For full effect, swim short repeats at race pace or faster with a generous amount of recovery time. The recovery period should be long enough to avoid accumulation of lactic acid. Insufficient recovery time will defeat the purpose. You should only feel mild lactic acid-induced discomfort. Speed training is enhanced by resistance and speed assisted swimming (see Chart 3).

Be sure to do your primary strokes to facilitate maximal adaptations in the specific muscle fibers. To enhance your speed training, try doing explosive starts off the blocks with half- or full-length sprints on long rest. Armed with this information, you should be able to practice converting your single-speed body into a finely-tuned six speed racing machine.

Train to train, or train to race – the choice is yours!

Doug Huestis, M.S., coaches the Fog City Masters in San Francisco. He is a member of the USMS Sports Medicine Committee and is Administrative Vice Chair of Pacific Masters Swimming. He holds a master's degree in exercise physiology, and is formerly the head Masters coach for the Olympic Club (1990-97), where his swimmers broke over 200 Masters national and world records.

Chart 1

AEROBIC TRAINING

Subtype of aerobic work	Repeat Distance	Rest Intervals	Set Duration	%of Aerobic Work	% of Max. HR
Anaerobic Threshold	300-500yd/m	10-30sec.	20-30 min.	50%	70-85%
Cruise Speed	100-300yd/m	5-20sec.	15-30 min.	30%	60-70%
Max. Aerobic (VO2 max)	200-400yd/m	1-2 min+	12-15min.	20%	85-92%

Chart 2

ANAEROBIC TRAINING

Subtype of aerobic work	Repeat Distance	Rest Intervals	Set Duration	%of Anaerobic Work	%ofMax HR
Anaerobic Endurance	50-200yd/m	30sec-2min.	600-800yd/m	75%	92-97%
Anaerobic Power	50-100yd/m	3 min+	200-400yd/m	25%	97-100%

Chart 3

SPEED TRAINING

Subtype of aerobic work	Repeat Dist.	Rest Intervals	Set Duration	% of Aerobic Work	%of Max HR
Speed assist (w/fins)	5-25yd/m	1-5 min.	100-300yd/m	50%	Not applicable
Speed resist (w/tubing)	5-25yd/m	1-5 min.	100-300yd/m	50%	Not applicable

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COACH EMMANUEL VERGE'

by Christiane Fournier Kramer

MASTERS SWIMMERS FROM A TRULY HETEROGENEOUS GROUP. AS A RESULT THEY REQUIRE A CAREFULLY PLANNED TRAINING PROGRAM. AS A MASTERS SWIMMER, I KNOW EMMANUEL VERGE' WELL AND HAVE BEEN BENEFITING FROM HIS JUDICIOUS ADVICE FOR ALMOST THREE YEARS. AFTER COACHING MASTER SWIMMERS IN FRANCE FOR OVER TEN YEARS, EMMANUEL IS NOW RESPONSIBLE FOR THE MASTER SWIMMERS OF CLUB DE NATATION LAVAL. AFTER WORKOUT, EMMANUEL GRACIOUSLY AGREED TO A SHORT INTERVIEW.

CFK: What motivates an adult to register in a Masters swimming program?

EV: Actually, swimming in a masters program provides different results according to individuals:

- Regain or maintain their shape and/or

"shapes";

- Combine physical exercise and social activities;
- Train to improve 'clocked' performances. The coach must adapt to the needs of the individual. The difficulty remains in building workouts that respond to those demands. You must be versatile in giving exercises, technical, physical or physiological explanations, which can be adapted to suit everyone's needs.

CFK: On the technical level, how does training masters differ from training the kids?

EV: I attach a great deal of importance to technique. In general, that is the aspect in which the Master swimmer has the most to gain. Breathing, propulsion, balance and co-ordination are explained in great detail. I give the maximum amount of information and justification on the 'why' and 'how' to execute an exercise, allowing each individual to participate in their own corrections.

CFK: In correcting strokes, what are the elements you emphasize most?

EV: In order, I try to correct:

- Breathing (which I think is very important);
- Good body and head position (often a source of "drag");
- Motor co-ordination of the legs (very long to correct especially with men);
- Motor co-ordination of the arms.

I start each new trimester by emphasizing technique correction, then I let the individuals "build" their new stroke and digest the corrections and information they have received. During that same period I also stress the physical and physiological aspects. The emphasis is on sets and drills that encourage the kinesthetic aspect. It's up to the adult to reconstruct this technique. For the physical aspect of the workout, pertinent information is crucial.

Continued on page 8

MENOPAUSE AND FEMALE MASTERS ATHLETES

BY DR JUNE CANAVAN

THE MENOPAUSE TRANSITION IS THE PERIOD OF TIME PRECEDING MENOPAUSE WHEN A WOMAN'S SEX HORMONE LEVELS MAY FLUCTUATE MARKEDLY IN A GENERALLY DECLINING FASHION. THIS PERIOD OF TIME MAY BE AS SHORT AS A YEAR OR MAY LAST 5 - 10 YEARS AND CAUSE CONSIDERABLE SYMPTOMS AND SIGNS WHICH MAY AFFECT ATHLETIC PERFORMANCE.

As a clinician I see female athletes who present with symptoms and thus I am dealing with women who are having difficulties in relation to the menopause or menopause transition. The comments that follow therefore do not necessarily apply to all female masters athletes but in fact some athletes here this morning who did not feel that the menopause had affected them may find that there are some symptoms which they have been unaware of or some training difficulties that have been ascribed to other conditions.

Menopause is defined as the cessation of menstrual periods and is therefore diagnosed in retrospect. Typical hormone levels at this time (which can be measure in a blood test) are an elevated FSH (Follicle stimulating hormone) and decreased serum oestradiol and serum testosterone.

Hormone levels in the menopause transition may be normal or may show an elevated FSH but a normal serum oestradiol and a normal serum testosterone. If the measurements are reviewed critically with respect to the time in the menstrual cycle at which the blood sample was collected the levels may in fact be lower than expected also.

Symptoms and signs of the menopause are really symptoms of oestrogen deficiency. These symptoms can be thought of as short-term, medium-term and long-term effects of oestrogen deficiency.

SHORT-TERM EFFECTS ARE MORE RELATED TO FLUCTUATING CIRCULATING LEVELS OF OESTROGEN.

TYPICAL SYMPTOMS ARE HOT FLUSHES, MOOD LABILITY, TIREDNESS AND PERHAPS PALPITATIONS.

Short-term effects are more related to fluctuating circulating levels of oestrogen. Typical symptoms are hot flushes, mood lability, tiredness and perhaps palpitations. Medium-term symptoms which may occur

after a year or two include dry skin, uro-genital changes causing vaginal dryness and urinary incontinence, and arthralgia. Long-term oestrogen deprivation causes problems such as osteoporosis, cardio-vascular disease and dementia.

If we now look at the symptoms and signs of menopause which may affect triathletes, both in training and competition, the impact of this change in sex hormone concentration becomes much more relevant.

Oestrogen receptors have been identified in many organs of the body and this explains many of the symptoms which have been described. For example the impact of vasomotor symptoms should not be ignored. Some women describe night sweats and the risk of heat illness due to dehydration becomes greater. Similarly the common hot flush may change thermoregulatory control. Palpitations are common in this menopause transition period and obviously may adversely affect performance.

MEDIUM-TERM SYMPTOMS WHICH MAY OCCUR AFTER A YEAR OR TWO INCLUDE DRY SKIN, URO-GENITAL CHANGES CAUSING VAGINAL DRYNESS AND URINARY INCONTINENCE, AND ARTHRALGIA.

Psychological symptoms may impact both on training and competition performance. Depression may make adherence to a training program more difficult and the fun and enjoyment of exercise may be lost. Poor concentration may increase the risk of accidents during a race and memory loss may cause confusion in transition areas. Mood lability and irritability may cause problems in squad training and athlete/coach relationships.

Other symptoms which may impact on training include urinary stress incontinence and bladder irritability. Many women develop muscle cramps during the menopause and this may lead to muscle injury if not treated adequately. As mentioned earlier joint pain and stiffness may also result from oestrogen deficiency and may progress to arthritis.

Testosterone deficiency has its own symptoms which may affect triathletes. The four cardinal symptoms of testosterone deficiency are a generalised reduction in well-being, tiredness, weakness and a decline in libido. The first three symptoms all affect athletic performance and some triathletes I know would argue that the last one does too!!

It seems prudent to me to treat the conditions I have described above. Triathletes spend a lot of money on various aspects of the sport to enhance their performance yet if

LONG-TERM OESTROGEN DEPRIVATION CAUSES PROBLEMS SUCH AS OSTEOPOROSIS, CARDIO-VASCULAR DISEASE AND DEMENTIA.

these perils of nature are not addressed this money is wasted. Treatment of oestrogen deficiency involves oestrogen replacement. Every woman needs an individualised treatment program and needs to be reviewed regularly initially until the dose is adequate and appropriate. There are several forms of oestrogen replacement: oral tablets, transdermal gel and patches, subcutaneous pellets or implants and topical applications. Acceptance rates tend to depend on safety issues particularly that of breast cancer. Although there have been a few studies indicating a small increase in risk there have been large numbers of good studies which do not show an increased risk of breast cancer associated with HRT use. Endometrial cancer risk is higher if progesterone is not used in conjunction with oestrogen in women with a uterus. If a woman has had a hysterectomy she does not need to take progesterone supplements.

The evidence supporting the protective effect of oestrogen on the brain is now very convincing and leads to a reduced incidence of Alzheimer's disease. Similarly oestrogen replacement reduces a woman's risk of cardiovascular disease considerably and as a triathlon doctor I am always concerned in age group races about the risk of heart attack during a race. I am very enthusiastic about the use of oestrogen in any female triathlete who has other risk factors for heart disease.

When we consider testosterone replacement in women there is usually mass hysteria. But it is well known that menopausal women lose some of their circulating testosterone and thus could be considered at a disadvantage. With the variation in age of the onset of the menopause transition some women in their late 30's and early 40's will be affected. There are several routes of administration of testosterone replacement in women: oral capsules, injections, hormone pellets or implants and in some countries a transdermal patch.

For both oestrogen and testosterone it is important to individualise dose depending on severity of symptoms, age and blood levels. It is possible to monitor response both by symptom score charts and blood levels.

There are many myths surrounding hormone replacement therapies. Contrary to popular belief, in my experience HRT does not lead to weight gain but weight gain

Continued on page 8

Coach Emmanuel Verge' cont'd from page 7

I explain in detail the different energy system, how to work them, and their effect on the physical and physiological training.

CFK: How do you plan your season?

EV: With Masters, it's hard to execute a plan. In many cases, frequent absences disrupt the physical preparation. So every practice is conceived to work every energy system with an emphasis on the aerobic workout. The anaerobic proportion of the workouts is dictated by the individual's objectives and timing in the season.

CFK: How would you define a good Masters' training program?

EV: I think you can qualify a good practice or program by its diversity. All the practices should be different; sets should be numerous and varied. Furthermore, all workouts should take place in an atmosphere that does not make the individual wish he had stayed in his warm cozy home instead. As I often tell my swimmers: "You've already done the hardest part of the workout by showing up".



Taken from *Canadian Masters Swimming*, Christiane Fournier, 706, 112e Av., Lafontaine QC J7Y 4R3 Ph + 450 438 7392, Fax + 450 438 7530, Email aenq@sympatico.ca

Menopause and Female Masters Athletes cont'd from page 7

occurs in menopausal period and fat tissue is deposited on the abdomen. Hair growth, particularly facial hair is one of the symptoms of menopause and can be prevented by HRT. I have mentioned breast cancer and acknowledge that it is a concern and regular screening must take place if a woman is taking HRT to enable early detection and therefore curative treatment.

Some athletes argue that HRT is unnatural. However, if women are diagnosed with an underactive thyroid they take thyroid hormone replacement. Similarly with diabetes cause by insulin deficiency. Nature did not design us to compete in triathlon (editor - or swim 800 breaststroke or 1 hour swims etc.) after the menopause but if we want to continue to compete safely, without injury, and enjoy our sport then some of us may need to consider treating our sex hormone deficiencies with HRT.

Above is a transcript of the address delivered by Dr June Canavan at the Female Masters Breakfast on Thursday 27 August 1998 held in conjunction with the 1998 ITU Triathlon World Championships in Lausanne Switzerland.

**Dates to Remember**

5 - 14 October 2001
8th Australian Masters Games
Newcastle & Hunter, NSW Aust

2 - 10 February 2002
New Zealand Masters Games
Dunedin, New Zealand

21 - 29 September 2002
Asia Pacific Masters Games
Gold Coast, Qld. Australia

5 - 13 October 2002
5th World Masters Games
Melbourne, Vic. Australia

19 - 26 October 2002
HONDA Masters Games
Alice Springs, N.T. Australia

1-9 February 2003
New Zealand Masters Games
Wanganui, New Zealand

March/April 2003
28th AUSSI National Swim
Perth, Western Australia

October 2003
9th Aust. Masters Games
Canberra, Australia

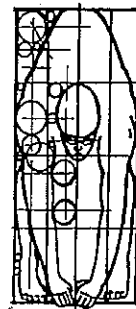
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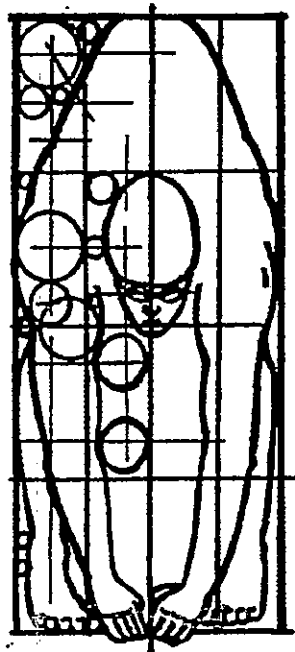
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Editorial

Hello Readers,

I hope you are all having a great start to 2001.

This issue includes a very extensive piece of research conducted by our National Coaching Director, Kay Cox. Kay presented this paper at the Australian Swim Coaches Conference last year. It contains facts and figures that all swim coaches and club committee members should read.

Jacinta Stirrat (NT Coaching Director) has written several articles for this issue, one a very practical one explaining all the terms and abbreviations we use.

Claire Reaburn

THIS ISSUE

Now You Have Them How Do You Keep Them?	1
Exercise and Osteoporosis	3
Tips for Top Swimming	4
Understanding Terms and Terminology	7
Dates to Remember	8

NOW YOU HAVE THEM HOW DO YOU KEEP THEM?

The AUSSI Masters Experience.

by Kay Cox PhD

National Coaching Director AUSSI Masters Swimming, and
University of Western Australia.

Introduction

Australians see themselves as a 'sporting nation'. Certainly with the euphoria of the Olympic games still present there is no doubt that this perception has been strengthened. This would certainly be an opportune time to start recruiting for membership in all sports, and particularly those in which Australians have excelled. Recruiting for membership is hard at the best of times at all age stages including children, adolescents, young adults and mature adults. There is much competition today for the individual's time and interest such as school, work, family and other passive forms of recreation such as television, videos and computers games. We also have a society that is fast adopting a 'fast food' approach to everything in life including recreation. For example they want to participate on their terms, when they want to and without major commitment. If sports and organizations cannot adjust to these demands and changes participation rates will suffer, particularly in the long-term.

Once you have attracted a person to be a member of your sport it is very important that you hold onto them as you have already expended resources in time and money in establishing them as a club member. Keeping adults involved in physical activity and sport is becoming increasingly challenging. Participation can be in non-organised sport and physical activity, or organised sport and physical activity. In this paper I will address primarily organised sport, the issues of continued participation, outline a theoretical basis for how people change their behaviour and become more active and give some practical examples from AUSSI Masters Swimming of the strategies that can be used to keep members participating. Even though I have used examples from a specific age group of participants i.e. Masters, these examples can

be applied at all age stages and all sports. The need for this is highlighted by the research that tells us that physical activity begins to decline at about 6 years of age and continues this decline throughout life (Malina 1996). Hopefully this paper will also stimulate some interest in encouraging sports to provide for their older participants and keep them involved in 'lifetime sport'.

How Active Are We?

There is no doubt that the majority of Australians recognise that being physically active is good for their health. Despite this the participation rate of Australians is disappointing with only 26% exercising at a sufficiently high level to improve fitness to a level thought to give health benefits and 29% being sedentary (DASET 1988) Participation in both moderate and vigorous physical activity declines with increasing age (Bauman & Owen 1991) with 60% of those

"...THE PARTICIPATION
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aged 20 years and under having participated in vigorous or moderate levels whereas only 20% of those over 50 years participated at this level. The Pilot Survey of the Fitness of Australians (DASET 1992) found fewer women than men participating in regular physical exercise and, whilst 69% of women surveyed participated in some form of physical activity at least once per fortnight, less than one in four exercised at sufficient levels to improve and maintain physical fitness and health.

A recent Australian Bureau of Statistics survey on participation in sport and physical activity (ABS 1999) found during the 12 months prior to 1998-1999:

- 59.4% of persons aged 18 years and over participated in sport or physical activity
- male participation rate was 62.6% compared to 56.3% for females
- participation was highest in the 18-24 age group (males 81.9%, females 78.8%)

Continued on page 2

Now You Have Them How Do You Keep Them continued from page 1

- participation declined with age, participation for 65 and over 36.8%
- 30.3% of persons participated in club or association organised sport or physical activities. 60% of these also participated in non organised activities
- 29.1% of persons participated solely in non-organised activities
- 32.3% of persons participated in sport or physical activity solely as non members

The last 3 points highlight the potential to develop club membership although it must be remembered that not all people want to be organised. This is also illustrated in the summary above. We need to make membership attractive and keep it that way.

This same report also noted that swimming rated as the second most popular activity (15%) ahead of walking (22.7%), however only 1.3% people participated in organised swimming. The most participants in organised activities were in aerobics/fitness, golf, tennis netball and lawn bowls.

What was encouraging was that participation in organised sports has been increasing since 1996, 26.5% compared to 30.3% in 1998-99.

What Do We Know About Retaining Participation?

Most of the research in this area has been done on people joining physical activity groups rather than sporting clubs and associations. Dishman (1988) reported that 50% of those who take up exercise have dropped out within six months. Studies that have taken individuals and have developed programs to increase their physical activity have found that the numbers who stay active in the program range from about 50-67% (Dishman and Buckworth 1996).

In the beginning stages of AUSSI Masters Swimming (i.e. late 1970's) our membership retention was about 50% which was similar to what other sports and fitness groups were reporting at the time. A review of the membership over the past five years shows that the retention rate ranges from 70-78% from State to State with a National average of 75%. The membership growth rate is 4%.

Why Do People Stop Participating?

The most frequent reason for giving up exercise is 'no time' (Owen and Bauman 1992) although this may not be as frequent in older subjects. Other reasons for giving up participation typically include, sickness, injury, family commitments and lack of enjoyment. A 1996 survey of members from the Victorian State Branch who had not renewed their membership found that the most common reason for not rejoining was 'no time' (28%) due to work, study and family commitments. Twenty four per cent had moved out of the area or could not be located and a further 8% were lost due to injury or illness. 'Lost interest' was the third most common reason for not rejoining (15%) with 6% going to other sports and 3% going elsewhere. This category linked accounted for 23% of the lost membership that may have been receptive to retention strategies. Being flexible in the time arrangements for training etc and with follow-up after sickness and injury are therefore other potential target areas to improve retention.

What Do the Theories Say About Retaining Participation?

There are several theoretical models of how people change their behaviour to become more active. One that has been used often in recent times is the Stages of Change Model (Prochaska and DiClemente 1982). This model proposes that individuals move through 5 stages when they adopt a new behaviour,

1. Precontemplation (not intending to change)
2. Contemplation (thinking about changing),
3. Preparation (making small changes),
4. Action (taking up the new behaviour- usually the 1st 6 months)
5. Maintenance (sustaining the behaviour for more than 6-12 months)

Individuals will go through these stages at different rates, often going backwards and forwards in participation until reaching the goal of maintenance. Researchers have found that if you do certain things to match a person's stage of becoming active you can enhance the

process (Marcus et al. 1992). Others have demonstrated that using these tactics in the first 6 months will predict long-term participation at a level sufficient to improve health (Dunn et al. 1999).

Can This Theory Be Applied to Sport Membership?

The answer is yes it can, in fact we do some of these things already but we could streamline the process more effectively by learning what tactics to use at the most receptive time for members. Table 1 gives a summary of the tactics that could be used.

Table 1: Summary of the stage-matched activities that can be done with members. These were based on the processes of change identified by Marcus et al. (1992) in each of the stages. Newsletters contained motivational information such as congratulations on progress and health and swimming information.

Registration to 6 Months	6-12 Months	12-18 Months
Action	Action-Maintenance	Maintenance
How to exercise/swim information	Progress report -results in events	Progress report-results in events etc
Costs and benefits of exercise	Injury prevention	Goal setting
Rewards for exercise	Newsletter	Choosing exercise partners
Goal setting	Trouble-shooting	Newsletter
Newsletter	(More barriers)	Injury prevention
Overcoming barriers	Newsletter	
Time management		
Injury prevention		

Other Relevant Influences on Maintaining Participation

Along with this theory of change in behaviour other consistent influences on whether people will continue to participate. They include:

- Confidence in one's ability to participate in regular sporting activity (self efficacy)
- Enjoyment of the sport
- Support from others
- Positive belief concerning the benefits of participating
- Lack of perceived obstacles to participation

Knowing Your Members

It is increasingly important for you to not only know your sport but you must know your members (clients). Sports have to assess the needs of their members, including their sporting, health and fitness goals, their emotional and social needs. Sports need to ask the question "what do we have to offer members?" and match this to the needs and goals.

How has AUSSI Masters Swimming used some of these strategies? Firstly some background about the organization.

AUSSI Masters Swimming In Australia

This organization was formed 25 years ago in response to the demand from people who wanted to participate in organised swimming activities with a goal of health and fitness. At that stage swimmers were retiring at the age of 16-20 years. Originally the age of joining was 25 years but this was lowered in Australia to 20 years to meet the demand of those that had finished age group swimming but wanted to continue to swim.

The purpose of AUSSI is, 'To encourage adults, regardless of age or ability, to swim regularly in order to promote fitness and improve their general health'. The motto of AUSSI is 'Fitness Fun and Friendship'.

Demographics (1999)

204 Clubs
7635 members
51% female 49% male
Largest age group 30-45 years
Age range 20-92 years (10 in 90-94 years age group)
Higher than average socio-economic group

Activities and Events

Clubs meet at least once a week for a club night and may have 3-4 more training nights. Club events include timed swims and awards swims.

Exercise and Osteoporosis

*Taken from SPORTS MEDICINE AUSTRALIA
Women in Sport Fact Sheet No 5*

Osteoporosis is a condition which results in bones becoming "thin" and fragile and breaking more easily. Osteoporotic fractures afflict 60% of women and 30% of men over the age of 60 years in Australia. The hormonal changes that occur during menopause lead to an increase in bone loss and result in thinner and weaker bones.

How is Osteoporosis Caused?

Throughout life bone tissue is very active and is constantly being 'remodelled'. Microscopic amounts of bone are continually being removed (resorbed) and reformed (laid down) in response to various factors. During childhood more bone is laid down than is removed. During early adulthood the two processes are balanced but bone continues to become thicker and stronger. Peak bone density, which is the maximum amount of bone in the skeleton during lifetime, is thought to be developed by the early 20's. After about the ages of 40 to 50 more bone is removed than is laid down, and very gradually the density of the bone begins to decrease, about 0.8 per cent per year. During menopause the decline in oestrogen levels results in an accelerated bone loss of 3-5 per cent per year.

Are Some Sportswomen More at Risk of Developing Osteoporosis?

In general, women who are slim, white, smoke, do not exercise regularly, have irregular menstrual periods or early menopause, are at highest risk of developing osteoporosis. Among sportswomen, those

most at risk are those who become amenorrhoeic (have no menstrual period for 3 months or longer). The decreased oestrogen levels associated with amenorrhoea cause increased bone loss, despite the positive effects of physical activity on bone density. Not all amenorrhoeic athletes have low bone density. However, prolonged amenorrhoea (no menstrual period for six months or longer) may result in low bone density and therefore 'early onset' osteoporosis (weak bones and fractures occurring at a young age) and an increased incidence of stress fractures. Other factors including training patterns and body composition may also contribute to injuries and stress fractures in athletes, eg some thin, highly trained endurance athletes, such as distance runners have very restricted diets and may not have adequate calcium intakes (see diet below).

How Do I Know If I Have Osteoporosis?

At present the only accurate method of assessing bone density and the presence or risk of developing osteoporosis is by a bone density scan. This can be arranged by your doctor and involves a simple, low dose x-ray test.

Some medical conditions (eg thyroid disease) and medications (eg corticosteroid medicines) are also associated with an increased risk of osteoporosis. Please check with a sports medicine doctor for information about specific conditions, particularly those athletes have not had a menstrual period for six months or longer.

Can Anything Be Done To Prevent Osteoporosis in Sportswomen?

Yes. The best way is to develop the highest possible peak bone density during childhood and maintain menstrual cycles in adulthood. Regular life-long weight bearing exercise or weight training will have a positive effect on bone density so sportswomen are a reduced risk. However, if the menstrual cycle ceases for any length of time (menorrhoea), oestrogen levels will fall which may lead to a decrease in bone density. Athletes who develop amenorrhoea (lack of menstrual periods) should consult their doctor to identify the cause.

Methods of treatment to prevent the possible detrimental effects of low oestrogen levels also need to be determined and may include 'hormone replacement' or the contraceptive pill. Athletes who remain amenorrhoeic have an increased risk of developing osteoporosis. Adequate calcium intake is also very important.

What Factors Affect Bone Density?

Several factors other than oestrogen levels affect bone density. Your genes (family history/heredity) are considered to be the most important determinant of bone density. Other modifiable factors such as a poor calcium intake, lack of exercise, smok-

ing and certain medications can increase your risk of osteoporosis.

Heredity

Bones, like many other features, are largely predetermined by genes. Sportswomen who are thin and small boned and have a family history of osteoporosis (eg mother or grandmother who have had an osteoporotic fracture) are more likely to develop osteoporosis.

Hormones

Many different hormones affect bone density, particularly oestrogen women (and testosterone in males). Young men have thicker bones than young women because testosterone has a greater positive effect on bone size than oestrogen. If, for any reason, sex hormone levels decrease (as can happen with training-related amenorrhoea) then bone density will be reduced.

Diet

A healthy balanced diet is necessary for normal bone growth and maintenance. Long term dietary restriction can be harmful especially if this is associated with amenorrhoea. During the teenage years and after menopause calcium needs are increased.

Poor calcium intake increases the risk of developing osteoporosis. Everyone, especially sportswomen, should ensure they get adequate calcium in their diet throughout life. Check the table for the best dietary sources of calcium.

How Much Calcium Do I Need?

The following table shows the recommended dietary intakes of calcium for girls and women at different stages of the life cycle.

Daily/dietary calcium intake can be estimated from the table on page 4. It is not necessary to take calcium supplements if daily intake is met from dietary sources. If unsure about diet adequacy, consult a sports dietitian. The table shows the recommended dietary intakes of calcium for girls and women at different stages of the life cycle.

Lifestyle Factors

Smoking and excessive caffeine, alcohol and salt may lead to bone loss. The risk of osteoporosis will be reduced by avoiding too much alcohol, salt and caffeine intake and by not smoking.

Exercise

Research has shown that regular weight training or weight bearing exercise such as jogging, tennis or aerobics (one hour, three times each week) increases or maintains bone density. Swimming and cycling are weight-supported sports and while excellent for aerobic fitness are not thought to be as effective in maintaining bone mass or preventing bone loss. Exercise can also help to maintain

*"Regular Weight Bearing
Exercise Can Play A Major Role In
Preventing Osteoporosis."*



Exercise and Osteoporosis cont'd from page 3

bone density in older people by reducing post menopausal bone loss. Regular exercise also improves balance, coordination and agility and may help to prevent falls.

Which Food are Good Sources of Calcium?

The best sources of dietary calcium are milk and dairy products. Fortified low fat products are recommended as they are often fortified with calcium and less fat. Check the labels of modified milks available to find out which has the best combination of high calcium and low fat. For those who do not use milk or dairy products, check the fat and calcium content of calcium enriched soya products.

Dairy foods are not fattening when low fat choices are made, so even when athletes need to reduce energy intake it is still possible to meet their calcium requirements.

Is There Any Treatment For Osteoporosis?

At present there is limited treatment for established osteoporosis although it is possible to delay bone loss by using hormone replacement therapy. This is particularly important for the post menopausal athlete. The risk of developing osteoporosis may be reduced through regular weight bearing exercise, a balanced diet with adequate calcium intake and maintenance of a normal menstrual cycle.

There are a number of medications that have recently been made available to treat osteoporosis, which may be discussed with a doctor or an endocrinologist.

Recommended dietary intakes of calcium for girls and women at different stages of the life cycle.

Teenage girls (12-15 years)	1000-1200 mg per day
Young adults (16-18 years)	800-1200 mg per day
Menstruating women	800-1000 mg per day
Pregnant/lactating women	1200 mg per day
Post menopausal women -no estrogen	1500 mg per day
on estrogen	1000-1200 mg per day
Amenorrhoeic athletes	1500 mg per day
Adults over 65 years	1500 mg per day

Food	Amount	Calcium
Low Fat (fortified) milk	1 glass (250ml)	405 mg
Soya beverage (fortified)	1 glass (250ml)	365 mg
Yoghurt	small carton (200g)	330 mg
Whole (plain) milk	1 glass (250ml)	300 mg
Hard cheese	1 slice (30g)	285 mg
Canned sardines (include. Bones)	50 g	275 mg
Processed (cheddar) cheese	1 slice (30g)	190 mg
Oysters	10	190 mg
Tofu	100g	130 mg
Almonds	50g	125 mg
Baked Beans	1 cup (240g)	108 mg
Canned salmon (include bones)	100g	90 mg
Cottage cheese	1/2 cup (100g)	60 mg
Broccoli	60g	15 mg

"A HEALTHY BALANCED DIET IS NECESSARY FOR NORMAL BONE GROWTH AND MAINTENANCE."

Tips for Top Swimming

Jacinta Stirrat

Fitness Director-Darwin Stingers & NT Branch

Whether you're new to the sport of Masters swimming or an old hand, here are some useful tips which may help motivate you and prepare you for that training session or upcoming competition.

Firstly, and before you even leave home, take a look at your swimming bag and what it contains. This will determine how prepared you are for the training session. Useful items to assist you train and with equipment in peak condition include:

Swim bag—look at the amount of gear the bag will contain and the frequency and distance you will be using it for. This could determine whether you purchase a large sports bag with several compartments (look for waterproof and drink bottle areas) or a backpack. The former, when fully loaded and used on a daily basis, can place undue stress on both the shoulders and back (and we don't want unnecessary injuries). The

latter is portable and has the benefit of not only being used on bikes, but can easily distribute the weight across the back and shoulders.

Accessories

- **Powder:** great for extending the life of caps as well as making them easier to put on;

- **Baby shampoo:** "No more tears" is best and just a few drops in goggles keeps them clear of grime, giving you a clearer perspective of your fellow swimmers and the water. Remember to wash it out thoroughly;

- **Toothpaste:** similar to shampoo, this can also help keep goggles clean and is a much cheaper alternative to the anti-fog products;

- **Goggles:** have a spare pair at hand, particularly as straps perish easily in the tropics. It's also good practice to make frequent use of your race goggles in training, particularly when diving, so you know the fit is correct when it comes to a race;

- **Goggles case:** these neoprene cases are relatively cheap and certainly save goggles

from the inevitable scratches they receive whilst stored in swim bags;

- **Swim caps:** have spares on hand (in a plastic bag to prevent powder spillage) as they perish easily and extend their life by powdering them and keeping extra supplies in the freezer. If you're 'thin on top' then a cap is ideal for retaining body heat in the Dry when the water is often cold. Also, two can keep you warmer than one.

- **Sunscreen:** 30+ and waterproof is optimal. Home brands are just as good as others and less expensive. Remember to apply them to 'thinning pates', but watch out for eye areas as it cause real problems here.

- **Electrolyte solution:** particularly great in hot weather, this enables rapid fluid replacement because yes, we do actually sweat in the water. As a general rule, use less than directed as these solutions are high in sugar and hard on teeth with extended use. Alternatively, diluted sports drink can

Continued on page 7

Now You Have Them How Do You Keep Them cont'd from page 2

Traditional swimming events include:

- Club meets
- Inter club sanctioned meets
- State Titles and club championships
- National Titles and club championships
- Pan Pacs, international meets
- FINA World Masters Titles
- regional, state, national and world Masters Games

AUSSI Activities

The organization had its base in a traditional swimming culture but evolved to meet the needs of our members. The following are examples of the types of activities that are available to members.

- Long Course Meets
- Short Course Meets
- Open Water Swims
- Postal Events
- Aerobics Awards
- Set Time - distance swims eg 3000, 5000m, 1/2hour and hour swims
- Top Ten Booklet
- Records, State, National World

Modified Rules

We have developed modified rules to adapt to the physical limitations of injury and aging.

Educational Programs

- Coaching accreditation courses level 1M, 2M
- Officials Course
- Educational Seminars all levels
- Participation in National Swim Conference
- Proposed swim camp 2001.

Assessing Members Needs

This is encouraged at all levels. The registration form asks members what their goals are. Clubs also assess this both formally via questionnaires and by club officials in particular the club coach when members join and as an ongoing routine activity. States have from time to time conducted formal surveys and the National management conducted a formal survey of members (Wegman 1990).

Types of AUSSI Swimmers

- Fitness
- Social
- Recreation
- Competitive

In the 1990 survey (Wegman 1990):

- 60% of members surveyed regarded the National objective AUSSI as being 'Fitness and Fun' whilst
- 54% regarded the official objective of AUSSI to be the encouragement of swimming to improve fitness and improve general health.

- Only 13% perceived the national objective to encourage adults to swim competitively. Further the expectation of 91% of people on joining was that they would achieve a certain level of fitness with 67% expected group training and

- only 45% had an expectation of competition.

Competition in the traditional swim meet format is not a major goal of the majority of members with only about 15-20% attending State swim meets and 7% of the membership attending this years National Swim. Other activities such as the Aerobics Award have a participation rate of 21% nationally.

Comments from the Victorian survey reflect the sentiments of many members of AUSSI Masters, "many people want to keep swimming but do not want to compete, therefore do not wish to continue to pay a fee which is in effect mainly

subsidising competitors". This however, is a perception as the competitive swimmer usually pays an event fee to participate in a competition such as a State or National Swim Meet.

Goals and Social Profile of AUSSI

The '3 F's' perhaps sum up the goals and social profile of AUSSI. This profile is very important to the success of the organization. The social activities are one factor that will often keep people coming back to swimming. The social support is a great motivator and encouragement to keep going. The 3F's are now recognised by physical activity promotion workers as the key reasons that keep the community active. AUSSI has been practising this for years from everyday activities through to International events.

Coaching Implications

Wegman's survey it would seem that formal competition has a low priority for AUSSI members. Fitness is a high priority and hence the coach must be sure of the fitness objectives of their members, whether it is for health, or performance. The time factor, i.e. the time available to train and the training time is of concern to the coach and the swimmer. There needs to be time to socialize at training but there will also have to be a balance with the water time available and the workout. Perhaps other social events can be organized so that this goal is achieved and there is time to swim.

The coach also has to be aware of the place of swimming in the overall activities of the swimmer. Even though 5 sessions a week might be needed to achieve performance goals this may not be possible. This requires flexibility and some creative thinking on behalf of the coach and club. Often there needs to be a rationalization of goals. A swimmer may be able to put in a big training effort for a special event one year but not the next.

Changing Participation Trends

Trends in participation also change. In WA and in other states there has been an enormous growth in the participation of swimmers both AUSSI and non-AUSSI adult swimmers in Open Water swimming. This pattern of participation fits into the lifestyle pattern of adults. They compete early morning, a weekend morning and the event is over in 1-2 hours leaving the rest of the day free for family and the usual routine. The events themselves are also attractive and the conditions in WA are certainly suited to this type of activity. Training programmes are changing to include more aerobic and distance work and some sessions in Open Water.

What Practical Strategies?**Developing Self Efficacy****The First 6 Months**

- The member must identify themselves as a swimmer
- Include in activities- make them appropriate to skill level
- Provide coaching to improve skill etc
- Allocate a club member as a mentor
- New member pack - information on what to do
- The humble club T shirt - uniform look the part
- Progression of activities timing is critical
- Provide feedback coaching and activity results
- Newsletter acknowledgement
- Graded activities - timed swims all in gender, and 5-year age groups

Maintenance Phase

- Provide advanced coaching and educational activities
- Coaches assessment
- Results books Aerobics, awards, Top Ten the more members included in some written acknowledgement the better

Newsletters**Enjoyment of Activities**

- Offer a wide of activities for all levels of involvement
- Aerobics Award attracts 21% of the membership
- Modified rules

"The coach also has to be aware of the place of swimming in the overall activities of the swimmer. Even though 5 sessions a week might be needed to achieve performance goals this may not be possible."

"Competition in the traditional swim meet format is not a major goal of the majority of members with only about 15-20% attending State swim meets and 7% of the membership attending this years National Swim. Other activities such as the Aerobics Award have a participation rate of 21% nationally."

Now You Have Them How Do You Keep Them cont'd from page 5

- Graded points score- Handicap trophies etc
- Fun events
- Social events
- Challenging events State National World events, Awards

Social Support

- Coach
- Other club members
- Others in age group
- Organised social activities
- Team uniform
- Involvement of family members
- Rosters transport etc

*Positive Benefits**External Rewards-*

- recognition of peers,
- printed results, medals, club trophies,
- 'Coach of the Year'
- 'Official of the Year',
- newsletters,
- T shirts, prizes,
- "Freddo Frog Stakes".

Health rewards

- coach and family,
- need to balance with injury
- 'Feeling better'

Overcoming Barriers

As outlined earlier in this paper the 3 major barriers to continued membership tend to be, lack of time, loss of interest, illness and injury.

Time

The club structures allows for flexibility in club and training times, some clubs meet during the day, others at night and some both day and night. They include family events so that the commitment to family can be partially fulfilled. Members are always welcome to swim with another club whether this is locally or interstate giving flexibility of venue and time. The type of competitions offered allow for postal swims so that the date may be flexible. In recent times competitions have changed from 2-day events to night or half day sessions.

Loss of interest and competition from other activities

This will always be a problem but offering a wide range of activities with varying levels of competition and challenges can overcome this. Well-planned club coaching and social events can prevent loss of interest. Only if the individual's goals are similar to those of the club or organization will long term retention be achieved. People need to well aware of the groups activities before they are encouraged to join. There must be an assessment of needs and goals.

Illness and Injury

These may not be entirely preventable however, the risk can be minimized by well-planned appropriate coaching programs and activities. With older adults there is an increased risk of both illness and injury. Members need to be well informed of risks, have a good level of skill and fitness. Coaches in AUSSI have qualifications that are specifically geared towards the adult and older adult participant. General and coaching newsletters are an excellent means to educate swimmers. Educational seminars and courses are aimed at prevention and good management.

The social support structure in AUSSI clubs is excellent when members are sick or injured. Members often form rosters to visit, to provide transport and even provide means when another member is ill or injured.

Conclusion:

When developing strategies to retain membership, sporting associations would benefit from looking at some of the theoretical models of changing physical activity behaviour. Sports tend to know their sports well but how well do they know their membership, what their needs are and how to change their exercise behaviour. In this paper I have examined the Stages of Change Model and how this can be applied to retaining membership. I have also looked at the major factors influencing people to keep coming to your club or group. AUSSI Masters Swimming whose retention rate of 75% was used to provide some examples of how these strategies could be put into practice. The challenge now is for you to go back to your sport, get to know your membership, develop a profile and see how you can adapt your activities to make full use of this knowledge. Some of these strategies you may already be using, possibly more effectively than the examples I might have quoted, but the question is

have you used them at the ideal time and are their other things you could do to retain your membership and build on this? The first 6 months of membership is the critical period and all the intensive work should be done here to make the member identify themselves with the sport, your club and for them to believe in their own ability to be a swimmer, an athlete, a basketball player or a hockey player etc. They also need to believe in their ability to continue to fit their sport into their lifestyle as the demands of their life stages change.

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"These (illness and injury) may not be entirely preventable however, the risk can be minimized by well-planned appropriate coaching programs and activities. With older adults there is an increased risk of both illness and injury. Members need to be well informed of risks, have a good level of skill and fitness."

"THE FIRST 6 MONTHS OF MEMBERSHIP IS THE CRITICAL PERIOD AND ALL THE INTENSIVE WORK SHOULD BE DONE HERE TO MAKE THE MEMBER IDENTIFY THEMSELVES WITH THE SPORT, YOUR CLUB AND FOR THEM TO BELIEVE IN THEIR OWN ABILITY TO BE A SWIMMER, AN ATHLETE, A BASKETBALL PLAYER OR A HOCKEY PLAYER ETC. THEY ALSO NEED TO BELIEVE IN THEIR ABILITY TO CONTINUE TO FIT THEIR SPORT INTO THEIR LIFESTYLE AS THE DEMANDS OF THEIR LIFE STAGES CHANGE."

Tips for Top Swimming cont'd from page 4

be used. Check the contents as some are high in salt and others require and acquired taste.

- **Food:** after a hard session, food consumption within 20 minutes will maximise energy replacement. Food as simple as a honey sandwich (no butter) or items such as rice and corn cakes, Nutri-grain, pasta or any food high in carbohydrates and sugar are excellent and will really offset fatigue & replenish depleted energy stores;

- **Containers:** do you need to store such items as glasses, jewellery, false teeth, keys, etc. Small sealed containers are excellent and make it easy to locate these when next needed.

- **Pool pass:** find out the cost and work out the feasibility of purchasing a 20-30 session card or a 6 - 12 month pass. Depending on how many sessions a week you're doing these are often a much more feasible alternative to paying individual session entry.

- **Medication:** most commonly used are asthma pumps/sprays. Have these at hand on deck, where they are readily available if needed. You should make your coach aware of other medications you use as they may have an effect on your training ability at the time, eg. Blood pressure, pain killers, antibiotics, etc.

Equipment

- **fins (long):** great for the occasional kick set or if you're trying to get the hang of a new drill/skill. These aids give you time to concentrate on performing the skill correctly. Once you have the 'feel' for it, good habits can then be practiced and developed on their own. There's a great use

for these as a method of feedback, but I'll tell you about that one next time.

- **fins (short):** similar to long, but require more leg work. They can often take pressure off sore shoulders and assist in performing new drills correctly;

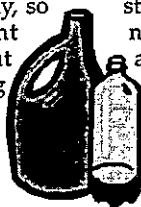
- **kickboard:** great to assist with buoyancy when performing kick sets. There is a wonderful motivational and feedback tool to use with this piece of equipment, but I'll save that for next month.

- **pull buoy:** these come in a variety of shapes and sizes and are excellent in assisting buoyancy (although some of us don't need any more of that) and isolating stroke technique. By also creating drag, more effort is required in the stroke;

- **paddles:** also come in various shapes and sizes. Too large and they create added shoulder stress and possible injuries. The moulded ones provide excellent fit and encourage better technique. It's also really important to work the full length of the stroke with paddles as the added stress often makes it easier to shorten one's stroke;

- **rubber bands:** are used to increase leg drag. Used in conjunction with either a pull buoy or fins they can add yet another method of varying the effort applied;

- **water bottle:** or two depending on the length of the session. These are a must to have on deck, but often take practice in ensuring all contents are consumed. Remember we need to consume at least 2 litres of water per day, so staying hydrated is important not only to daily function, but also assists in preventing cramps and



headaches. Remember if you're feeling thirsty, you're already dehydrating. Sip regularly throughout the session.

- **bathers/togs/etc.:** the best fits come from the reputable brands and while these may be more expensive, they're made for function, not for appearance. To extend the life of your bathers, rinse with water after use, avoid using the washing machine and hanging in the sun to dry. Store them in the freezer and they'll last for years (if used just for competitions). When cold wear two pairs for insulation and if you have a pair where the lycra has started deteriorating use them as a second pair for warmth, to extend the life of both pairs and for drag in training. When purchasing bathers for competition, the rule of thumb is to buy a pair that is a size smaller than you use for training. These may be tight at first, but give you a more streamlined 'feel' for the water and provide less drag. They're great for giving you that youthful, firm look, too.

- **Chamois:** compact and portable, these are great for use immediately after leaving the water. Used first, they can keep your towel lighter and dryer. They come in various sizes according to need.

- **towel:** Forget the bath towel - we all need the larger ones to sit on, get us completely dry and often keep us warm after a training session in cooler water.

- **Tote bag:** these mesh bags are great for keeping your equipment together and make it easier to carry onto the pool deck. The added advantage is that it minimises loss of gear and enables wet gear to drain, as well.

Hope these tips put you on your way to more enjoyable training sessions as you'll be prepared to meet the little hiccups that occur, and move on to a better performance.

Understanding Terms & Terminology

by Jacinta Stirrat

Fitness Director - Darwin Stingers and NT Branch

Here are some common terms I'm sure you have heard around the deck, related to your performance and training. Hopefully, this brief explanation will help you understand your training sessions better and give you more motivation to achieve these levels when they come up in a session.

Terminology

HR = Heart Rate - the number of times the heart beats per minute.

SC - Stroke Count - number of strokes taken per lap.

SR - Stroke Rate

Aerobic = using O₂ (oxygen). The body can continually supply the amount of O₂ needed for exercise, therefore you can per-

form over a long period of time, eg 400m+

Anaerobic = without O₂. The body cannot supply the amount of O₂ for intense exercise, hence it is only performed for short periods of time, eg. 50- 100m

Lactic acid = builds up in the muscles and blood after periods of high intensity when the body cannot supply enough O₂ to keep performing continually & so causes muscle fatigue. As it is a toxin, it is important to ensure its removal through a swim down at the end of the session. Aim for 1-1.5km at 65% effort of the previous set. If you find yourself stiff the next day, then all lactic acid has not been removed.

Lactate tolerance = able to continue performing when lactic acid builds up in blood and muscles. This will increase with training

Anaerobic Threshold = The intensity of effort at which lactic acid accumulates at. If you work at this level, at which there is a small amount of discomfort, you will achieve

a 'training effect' and will gradually see improvements in performance.

VO₂max = maximum oxygen consumption and is the largest amount of O₂ a person can utilise within a given time.

HRmax as a "very" general rule of thumb can be measured using the following: $HR_{max} = 220 - \text{age in years}$. Many people have much lower rates so don't worry if you fail to fall into this range.

BBM = Beats Below Max. 30-40 BBM therefore means for a 50 year old's HR_{max} of approx. 170beats, he/she should be aiming for 130-140beats/min

'talk test' = is a useful guide to the intensity of training. When exercising below the anaerobic threshold it is usually possible to talk freely during a continuous training session.

Frequency = how often you train. Need to aim for at least 3 sessions/week in order

Continued on page 8

Terminology cont'd from page 7

to maintain fitness levels, more to improve.

Intensity = how hard you work, ie effort put in during the session/set. Needs to be around 75% of HRmax to be of benefit.

Duration = how long the session lasts for. Needs to be 30mins or more to be of benefit.

As a rule variations in the above bring about different results.

Type of Set*

A1	Low intensity aerobic
A2	Aerobic
ANT	Anaerobic threshold
LTA	Lactate tolerance - short rest
LTB	Lactate tolerance - long rest
VO2max	Maximum Oxygen consumption
HVS-LP	High Velocity Sprint 15/25m Lactate Peak

Intensity Level

Intensity Level	Heart Rate
A1	50-60% 40-50 BBM*
A2	60-70% 30-40 BBM
ANT	70-80% 20-30 BBM
LT	80-90% 10-20 BBM
VO2max	90-100% HRmax

Goals:

Short Term - These are the most important. Achieve these goals and Long Term goals will take care of themselves.

Psychological - mental preparation ie focusing

Technique - includes turns and stroke correction

Long Term - Times at major meets you aim at achieving. Remember to evaluate your goals.

Next month I'll supply some examples of sets for these terms so you can better understand how they apply to training, but for now tis is enough to digest. I'll also talk about recovery, something very important to us all if we hope to continue training and improve.

(some explanations are courtesy of Mark Davies, Casuarina Swimming Club)

Workouts Worth Heart Attack Risk

Boston: Vigorous exertion dramatically increases the chances of someone having a heart attack.

But vigorous, long-term exercise provides so much protection against heart disease that the risk is more than worth it, a study of 21, 481 male physicians has revealed.

Dr Christine Albert, of Brigham and Women's Hospital in Boston, led the team that examined data from the Physicians Health Study, which began in 1982.

The researchers found the chance of a man dying during a particular exercise session was one in 1.5 million.

Men who exercised vigorously less than once a week were seven times more likely to die during it, or just after working up a sweat, than someone who exercised at least five times a week.

The benefits of a physically active lifestyle in warding off heart disease "clearly outweigh the small risks", the team reported in the New England Journal of Medicine.

Dates to Remember

4 - 8 April 2001

26th AUSSI National Swim
Melbourne, Vic. Australia

5 - 14 October 2001

8th Australian Masters Games
Newcastle & Hunter, NSW Aust

2 - 10 February 2002

New Zealand Masters Games
Dunedin, New Zealand

5 - 13 October 2002

5th World Masters Games
Melbourne, Vic. Australia

21 - 29 September 2002

Asia Pacific Masters Games
Gold Coast, Qld. Australia

19 - 26 October 2002

HONDA Masters Games
Alice Springs, N.T. Australia

March/April 2003

28th AUSSI National Swim
Perth, Western Australia

October 2003

9th Aust. Masters Games
Canberra, Australia

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