THE MASTERS ATHLETE

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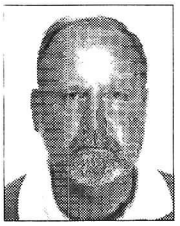
Masters Games - Sport or Tourism

Guest Editorial - Ron Burns, Australian Sports Commission



Ron Burns

As Mature Age Sport has developed over the past decade one of the unique features has been the growth of Masters Games. These Games have added another dimension to the competition opportunities for mature aged Australians.

In 1986 the first Masters Games in Australia was held in Alice Springs. This event has continued and, now called the Honda Masters Games, was conducted for the fifth time in 1994 attracting almost 5,000 people to Alice Springs, a significant increase on the 900 who attended the first Games. There are now at least eight Masters Games conducted in various parts of Australia each year with the most recent Australian Masters Games in Melbourne attracting 10,600 participants from 26 countries. The outstanding event, not only in Mature Age Sport, but in all sport in Australia in 1994, was the World Masters Games in Brisbane at which 23,659 competitors from 72 countries participated.

This growth in Masters Games means that an increased number of opportunities for participation in sport by mature aged Australians now exist, and this in itself must be a positive development. However, very few people speak about the sports development aspect when discussing Masters Games, but concentrate on the economic and tourism elements of these events. The World Masters Games produced an economic benefit of almost $60 million for Australia, the Honda Masters produces $6 million for Alice Springs which has a population of 25,000 and Canberra, the venue for the next Australian Masters Games, is predicting $10 to $15 million into their local economy in 1997.

The danger in this is that governments at all levels could come to regard Masters Games as primarily a way of increasing economic activity, rather than a chance to increase opportunities for participation in sport. There is already evidence of some government agencies, including local government, hosting an event, without consultation with sporting organisations because of the economic and tourist activity they believe will be created, and then approaching sporting organisations to organise and conduct the events.

This can place an enormous load on the sports organisations which does not always produce tangible benefits for the sports. Rarely do the agencies promoting the Games consult with the sports organisations to identify the benefits which could accrue to the sports. In some cases this has lead to poorly organised events because of unmotivated organisers, but more commonly the result is burnt out volunteers. The net result for sport is negative, if only through the loss of workers.

If this problem persists, sporting organisations may need to develop strategies to ensure that they maximise the benefits to their sport from involvement in Masters Games. Many commentators refer to sport as an industry or speak about "sport as business". If sport is business then the business of sport is sport, not tourism or hospitality and it behoves sporting organisations to use these opportunities to maximise their core business, not to just operate as an adjunct to another agency or industry's business.

Editorial

From our editorial staff and contributors - a happy new year to you all. We hope you had a great Christmas and the waistline hasn't expanded too much.

Warmest wishes to our triathlon contributor, Greg Reddan who we hope has a speedy recovery. Greg took a spill while out cycling and suffered a broken femur. Someone once told us that there are two categories of cyclist - those that have been knocked off and those that will be!

We are in the process of planning topics for the next 12-24 months. If you have any topics which you would like to know more about, please drop us a line.

Those new readers wanting to catch up on previous issues, they are available at a cost of $5.00 each.

Hope 1996 is a good year.

Peter and Claire

This Issue..

SPORTS NUTRITION

Eat to Compete

© by Holly Frail

The quest for every masters athlete is to perform at their best on the most important days - competition. The long hours and hard work have been done, and the fine-tuning must begin. Each sport has its own nutrition-related obstacles to overcome, whether it be running out of muscle glycogen, dehydration or lactic acid accumulation. Whatever your event, careful planning and preparation for both before and during competition are essential.

Holly Frail

■ Leading up to competition

Preparation for competition involves refining your daily menus to maximise carbohydrate fuel (glycogen) and fluid stores. For many of you involved in endurance activities at this time of year, this will require careful glycogen loading techniques over the 2-3 days prior to your event - i.e. as you taper the intensity and duration of your training. In order to achieve this, you will need to reduce your consumption of both fats and protein to allow for the extra carbohydrate foods and fluids.

True carbohydrate loading is of most benefit to athletes competing in events lasting 90 minutes or more. However, it has shown to be useful for some other athletes and teams preparing for a tournament where they may be involved in more than one game or event. This

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THE MASTERS ATHLETE

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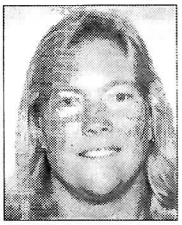
SPORT PSYCHOLOGY

That Little Voice in Our Heads

© by Dr Stephanie Hanrahan

What we say to ourselves affects our performance. Negative self-talk creates stress and impairs performance. Usually if we are stressed and having a bad performance we are also not enjoying ourselves a whole lot. For these reasons negative self-talk is to be avoided.



Dr Stephanie Hanrahan

Examples of negative thoughts include worry about performance, thoughts of "I'm not good enough", indecisiveness, preoccupation with physical signs of stress such as heat or breathing, worry about the possible consequences of performing poorly, and frustration about trying to change things we can't control.

Positive self-talk, on the other hand, can lead to realistic and constructive thoughts and can improve the chances of our reaching our goals. It must be pointed out, however, that positive self-talk by itself does not guarantee success.

Most of us are aware of the little voice in the back of our heads. It's great when we can learn to ignore it when it's saying things we don't want to listen to, but it's even better when we can learn to control what that voice says. We weren't born saying negative things to ourselves. We've learned to say these things and therefore we can learn to have more constructive self-talk. However, before we control our self-talk we need to be more aware of it.

■ Recognition

Negative self-talk often goes unnoticed because it is automatic. The first step is to learn to detect negative self-talk. This can be done by including notes of our self-talk during performance in our training logs. It can also be useful to backtrack when we feel stressed. Usually when we feel stressed there is an accompanying negative thought such as worry or frustration (as mentioned in the first paragraph).

Once an unwanted thought is recognised, the first way many people try to deal with it is to tell themselves not to think about it. For those of you who have tried this technique, you probably found it didn't work. Any time we tell ourselves not to think about X, we do nothing but think about X. (For example, right now, don't think about pink elephants)!

■ Thought Stopping

A simple but effective technique for dealing with unwanted thoughts is called 'thought stopping" or "thought stoppage'. This doesn't mean stopping all thoughts and becoming brain dead, but rather stopping the thoughts we don't want to be having (controlling that little voice). Thought stopping involves three steps:

1. Recognise
2. "STOP"
3. Replace

Once an unwanted thought is recognised we want to disrupt that thought. This can be done by screaming "STOP" silently to ourselves (or out loud if you're really game), snapping fingers, imagining a red flag flying in front of our face, or any other simple act that will momentarily interrupt the unwanted thought. The unwanted thought is then replaced with a constructive thought. I find that the easiest way to do this is to have a preselected cue word or phrase that I say to myself as I exhale (using the cue word in time with breathing is an added bonus, as breathing serves as another method of focusing our attention). For individuals involved in multiple events, it can be useful to have different cues that allow you to focus on relevant thoughts for different events. Select words that you feel will help you focus on relevant and useful aspects of performance. It doesn't matter if the words don't make sense to anyone else, as long as they work for you.

■ Ideas for Cue Words

alert	keep it simple
attack	powerful
be patient	push hard
concentrate	quality
control	quick
explode	speed
fast	ssmmoootthh
feels good	stretch
focus	technique
form	tempo
hang in there	timing
intense	tough it out

■ Practice

This technique, although simple, only works if it is well rehearsed. If we're stressing out and getting uptight, it won't do us much good to think, "now what was I supposed to do...say a word and breathe...what was that word...". The process of thought stopping should become automatic. This will obviously only occur if the technique is practiced regularly.

It is easiest to begin practicing the technique while lying down on your back with one hand on your stomach just below your belly button, and the other hand resting gently on top of that hand. If you have back trouble, put your feet up on a chair. With your eyes closed slowly inhale in such a way so that your stomach and hands rise and then exhale so that your stomach and hands fall. Try to spend the same amount of time breathing in as you do breathing out. Try to make the transition between the two as natural as possible as if your breathing has a mind of its own. Now every time you exhale say your preselected cue word(s) to yourself. All you should be aware of is your breathing and your word(s). If other thoughts come in to your head, STOP and redirect your thoughts to your breathing and your word(s).

Long hours of practice are not needed. Just 3-5 minutes once or twice a day is great. Once you're comfortable doing it lying down, then move to a sitting position and then a position that is relevant to your sport. Then practice the technique during training sessions. Eventually the thought stopping technique should become automatic so that unwanted thoughts can immediately be stopped and replaced with constructive ones.

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ENDURANCE

Methods for Determination of Anaerobic Threshold

© by Dr Peter Reaburn

Each of the previous issues of TMA has emphasised the importance of using different training intensities to maximise our endurance performance. Indeed, we have also stressed that anaerobic threshold (AnT) training is critical for strong performances in most endurance events. This article examines ways that are available to determine what your anaerobic threshold heart rate might be.

Peter Reaburn

1) AnT as a percentage of maximal heart rate. The easiest way to determine your anaerobic threshold is to work at 85-90% of your maximal heart rate. While it is strongly recommended that maximal heart rates for an older (>40 years) athlete be determined within a sports science laboratory with a sports physician in attendance, the experienced and healthy masters endurance athlete may decide to determine maximal heart rate themselves. This can be done by warming up well, then doing 10 continuous one minute increases in intensity starting easy then gradually building till the last minute is flat out. The test should be done wearing a heart rate monitor and be followed by a 10-15 minute warm down.

If you are a triathlete, you will need to know your maximal heart rate for swim, bike and run; they are *usually* different with running generally the highest, cycling approximately 10 beats per minute lower, and swimming the lowest at 10-20 beats lower again (Table 1 below).

	Rowing	Swimming	Cycling	Running
Maximal heart rate (MHR)	169	155	160	171
Anaerobic threshold (AnT) (85-90% MHR)	144-152	132-140	136-144	145-153

Table 1: Maximal and anaerobic threshold training heart rates of a 50 year old when swimming, cycling and running or rowing.

2) A lactate curve is usually done in a sports science laboratory under the supervision of an exercise physiologist. It involves working progressively harder (running or swimming faster, pushing bigger gears, increasing time per 500m on a rowing ergometer) every 3-5 minutes while blood is taken and heart rates recorded. Lactate is produced in relatively large amounts when the muscles begin working anaerobically (in the absence of enough oxygen). Once produced in the muscles, the lactate moves into the blood. When the concentration of lactate rises dramatically in the blood, scientists have suggested the athlete is at anaerobic threshold (Figure 1).

While the lactate curve is the most scientific method for threshold determination, it generally requires the experience and knowledge of sports scientists and quite expensive equipment. Most Physical Education / Human Movement Studies Departments at Universities offer this type of service.

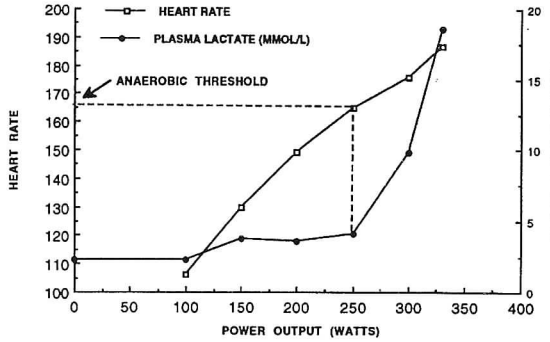


Figure 1: Blood lactate responses of a 30 year old rower to increased exercise intensity (watts) on a rowing machine. Note the rise in blood lactate at 240 watts or heart rate 169 beats per minute.

3) The Conconi method was developed by an Italian sports scientist named Conconi who worked with former world one-hour cycling champion, Francesco Moser. The principle of this test is that work rate (speed, power) is increased every 30-60 seconds and heart rate recorded at the end of each 30-60 second period using a heart rate monitor. You then plot a graph of speed against heart rate (Figure 2).

Conconi believes that heart rate increases in a straight line until a particular speed (anaerobic threshold) at which the line curves downwards. My experience with this method is that it works with some athletes but not with most. However, the beauty of the test is its simplicity; all you need is a heart rate monitor and a pen and paper. You can contact the suppliers of Polar heart rate monitors for more details on the Conconi test.

4) Time trial. One of my postgraduates at the Queensland Academy of Sport recently undertook a study on 14 young, high performance cyclists. We were investigating whether high performance athletes could self-select AnT. On two occasions, the cyclists were tested. During the first test they did 10 x 4 minute increases in work on a windtrainer and we took blood out of their earlobes in order to do a lactate curve. We determined the AnT at 285 watts of power using the lactate curve. On the second occasion, we asked the cyclists to ride at the highest but most consistent power output (watts) they could hold for 40 minutes. The cyclists self-selected 287 watts - so close to what the blood lactate curve showed AnT to be, that the difference is negligible. We concluded that high-performance athletes appear to be able to self-select threshold during a 40-minute time trial. I'd suggest that for masters athletes a 30-minute test may be enough. This 30-40 minute time-trial should be done on an uninterrupted course (pool early on a Saturday or Sunday, a windtrainer, rowing ergometer, or run track) and at a steady state pace with no sprint at the end. The aim is to self-select a pace you can maintain continuously for a 30-40-minute time trial with no change in pace. The heart rate at the end is going to be very close to your anaerobic threshold. The beauty of this test is its simplicity. However, my experience is that this test is most useful for experienced athletes who know how to hold pace well.

Once determined, the AnT heart rate, like all training heart rates, will be subject to increases due to dehydration and training in hot and humid conditions. The smart masters athlete must learn what this "feeling" of AnT is like and listen to the body rather than becoming a slave to a heart rate monitor.

I cannot emphasise enough how AnT training will improve endurance performance. As I've also emphasised, AnT training should be done at the most 2-3 times in a hard week, and only after having developed that all important base. Be smart - try it and watch those times drop.

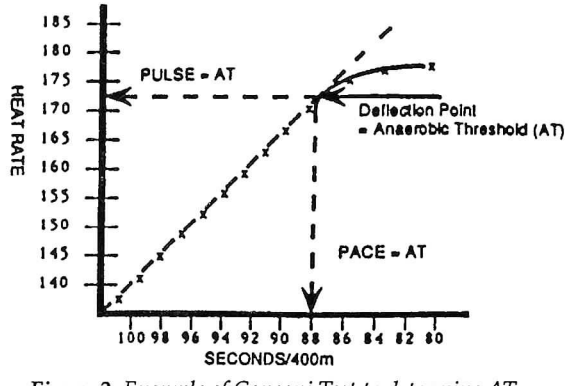


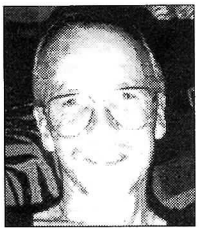
Figure 2: Example of Conconi Test to determine AT.

SPORTS MEDICINE

Hints for the Travelling Athlete

© by Dr Terry Farquharson

As travel is becoming easier, athletic competition interstate and overseas is becoming more common as are its associated problems and the advancement of travel medicine to prevent or manage these problems. Increasing numbers of travelling teams are being accompanied by a health professional, commonly a doctor, physiotherapist or masseur.



Terry Farquharson

My experiences as team medical officer with the Australian Veterans Athletics Team competing at the World Veterans Athletic Championships in Finland in 1991, Japan in 1993 and last year in the U.S.A. illustrate the common problems one faces. Some 25% of my consultations have been for respiratory tract infections, 25% for chronic injuries, 25% for acute injuries, 10% for skin disorders and then assorted other problems. Because I have not been blessed by the assistance of a physiotherapist or masseur I have found acupuncture useful for managing many of the injuries.

The absolute necessity of having travel insurance is illustrated by two of my experiences. Firstly, one of our male athletes in Myazaki, Japan, fractured his patella (kneecap) requiring evacuation home for surgery. Secondly, an Australian family in Buffalo, U.S.A. suffered the tragic death of their son requiring arrangements to be made for transfer of the body home. The associated costs would have been exorbitant had the families not been insured.

■ Air travel

Travellers with respiratory, ear or sinus infections are at risk of barotrauma (pressure injury) when taking off or landing as aircraft cabin pressures change during ascent and descent. This may be assisted using decongestant nasal sprays or tablets and by mechanical ventilation of the middle ear either by chewing, swallowing or by pinching off and blowing the nose. The concentration of oxygen in the cabin is less than at sea level and may affect individuals with heart or lung disease and in some cases require supplementary oxygen. Diabetics need to take care because of changes in food, meal schedules, exercise and insulin requirements and regular checks of blood sugar are advisable. Elderly people are at risk of deep vein thrombosis (a blood clot in the calf veins) due to prolonged sitting in aircraft so that regular exercise in the cabin is wise.

Everyone is aware of jetlag, the tiredness that occurs during air travel involving rapid time zone shifts. It can be minimised by

- adjusting sleeping times at home to those of the destination.
- avoiding overeating on the plane, particularly fatty foods.
- maintaining hydration and avoiding alcohol, tea, coffee and cola drinks.
- exercising regularly on the flight.
- assisting sleep with short-acting hypnotic drugs (eg. temazepam) and using ear plugs.

■ Immunisations

Tetanus, diphtheria and polio immunisations should be up to date and if travelling to a country where there is doubt about the safety of food and water then hepatitis A should be immunised against. If participating in a contact sport (or if sexually promiscuous!) then hepatitis B protection is wise as is influenza vaccination if travelling to an area experiencing an outbreak of the 'flu'. Most other immunisations depend on the destination so you will need to check the current recommendations for that country from your G.P. or local Travellers Medical and Vaccination Centre (TMVC).

■ Travellers Diarrhoea

Twenty to 50% of travellers to developing countries experience one or more episodes of diarrhoea so take care with food and water. The simplest thing to remember for food is that if you can't peel it, cook it or boil it then don't eat it and for water only use bottled water or water that has been sterilised by boiling or using chlorinating tablets.

■ Malaria

Areas of the world infected by malaria are constantly changing as are the sensitivities of the malarial parasites to the drugs we use to protect ourselves from them. Accordingly, up to date information from your G.P. or TMVC is necessary to obtain the correct advice. In many cases it is adequate to simply use protective clothing (long sleeve shirts and slacks) and DEET-containing spray or mosquito repellents.

■ Heat Acclimatisation

You will remember 1994's World Athletics Championships in Tokyo where Australians, notably Steve Moneghetti, performed well below expectations in the hot, humid conditions. Research indicates that the body acclimatises to heat in two to three weeks by an increased capacity to sweat which produces more efficient cooling of the body. Moneghetti had spent five weeks in Spain prior to the marathon, a time one would have thought more than adequate for acclimatisation. Undoubtedly much more time will be spent addressing the subject before Atlanta.

■ Altitude Sickness

As one rises higher into the heavens there is less oxygen to breathe meaning that you get more puffed after exertion. Given time, the body adjusts. However, if you ascend too quickly then the body becomes starved of oxygen and symptoms of headache, nausea, lassitude and insomnia, the first symptoms of altitude sickness, develop. Problems start to occur above about 3000 metres and can largely be prevented by not ascending more than 300 metres a day above this level as well simple measures such as drinking plenty of water, eating light meals and avoiding alcohol, smoking and the use of sedatives. There is only one cure for altitude sickness - do not go any higher and if it is more serious then descend. You can understand how problems can develop when someone flys directly to a high altitude to compete.

■ Scuba Diving

Flying after scuba diving may be associated with decompression sickness due to the lower cabin pressure in the plane and accordingly should be avoided for at least twelve and probably 24 hours after the last dive. The antimalarial drug mefloquine may cause dizziness so it should be avoided if scuba diving.

■ After returning home

Some diseases contracted overseas have long incubation periods meaning that symptoms will not appear for weeks or months. For example, typhoid -one to three weeks, hepatitis A- two to seven weeks, hepatitis B up to six months and malaria up to twelve months. Accordingly, if you develop an illness some time after travelling be sure to tell your doctor of your travels.

As you can see, there are many things to think about and do when travelling and competing. However, there is no doubt that it is worth the effort.

Nutrition article continued from Page 1...

would include perhaps tennis players, a netball or basketball tournament, a swim or track meet, or a touch competition.

In practical terms, you should aim to consume 10 grams of carbohydrate for every kilogram that you weigh. This will facilitate storage of up to 2-3 times the normal amount of glycogen in you muscles - very useful for the marathoner, road cyclist and triathlete! The other side benefit is that along with the glycogen is stored extra water (as long as you consume enough during your loading). This aids in the delaying or hopefully preventing the dreaded dehydration-related fatigue during the event.

Some practical tips include choosing lower fibre carbohydrates and extra sports or carboloading drinks to help you reach your carbohydrate goals without suffering feelings of extreme "fullness" or gastro-intestinal problems such as diarrhoea or wind! The sample menu plan gives you an example of the daily intake required for a 70kg athlete while carbohydrate loading (700 grams of carbohydrate).

Breakfast:
1 glass of fruit juice
2 cups of breakfast cereal with 1 cup of reduced fat milk
2 slices of toast with jam/honey (no butter)
1 banana

Morning Snack:
2 unbuttered crumpets with honey

Lunch:
1 large bread roll with salad (with or without a small serve of low fat protein)
1 large bread roll with banana
1 glass of juice or cordial

Afternoon Snack:
1 tub of low fat fruit yoghurt
1 fruit muffin

Dinner:
2-3 cups of cooked pasta/noodles or rice with a tomato/vegetable based pasta sauce or steamed/stir fried vegetables
a small serve of lean meat/skinless chicken/fish (this may be omitted if desired on the final night before the event)
2 slices of bread
1 bowl of fruit salad and a tub of low fat fruit yoghurt

Supper:
2 slices of raisin toast with jam/honey (no butter)
1 glass of reduced fat milk or a glass of juice

During the day:
750 ml of a sports drink or 250 ml of a carboloading drink
Plenty of water

(Hint - if eating these amounts of foods seems daunting then you could substitute more sports or carbo-loading drinks)

■ Competition day

By the day of competition, your glycogen stores should be filled to capacity, and all that is required now is a pre-event meal (or meals and snacks) composed of easily digestible carbohydrates. A larger, more substantial meal (including some low glycemic index carbohydrates-see Issue 3 of TMA) should be consumed 3-4 hours prior to the event, while a smaller meal or snack should be taken perhaps 2 hours before. The timing and selection prior to your event will depend on your individual preferences and appetite, as well as the start time. It is very important, however, not to avoid eating - even if nerves are taking over.

Fat in your meals will slow digestion. Excess protein is not required and may add to dehydration, and excess fibre may cause unpleasant and uncomfortable gastro-intestinal symptoms. All should be avoided! The most important factor to consider is what YOU feel good competing on. If you are too nervous to eat, try a liquid meal replacement drink such as Sustagen, Exceed Sports Meal Plus, Gatorpro, or Ensure or even a home-made low fat "smoothie" instead. If you are intending to try a new pre-competition meal - choose a training session or less important event at which to do this.

■ One hour pre-event

Intake of carbohydrates in the hour before competition has previously been reported to give rise to an insulin-mediated rebound hypoglycaemia (a sudden increase in blood sugar levels followed by a sharp decrease to below normal levels), increased use of those glycogen supplies, reduced use of fats for energy and speculation about impaired performance. It appears that these possible disadvantages may have been overstated, and there may be individual variations in response. If you feel that you may be sensitive to blood sugar changes at this time then it may be prudent to avoid concentrated sources of carbohydrates (e.g. soft drinks, juices) during this period.

Recent research suggests that carbohydrate (e.g. sports drinks, confectionary) consumed immediately prior an event (i.e. 5-10 minutes) may prolong endurance performance. Try this out in training before attempting it at competition time.

■ During exercise

For short events, cool fluids (e.g. water or perhaps sports drinks) are all that is required during the course of that exercise. For endurance and ultra endurance events, carbohydrate and fluid intake is essential to prevent muscle glycogen depletion, hypoglycemia (low blood sugar) and dehydration.

You should experiment to see which types or combinations of carbohydrates suit you best. You may use liquid sources (sports drinks, dilute cordial, glucose gels or syrups) and/or food sources (fruit, "sports bars" etc.) to reach your requirements. The amount of carbohydrates

Continued on Page 8

Athlete Profile

Name:
Fred Knudsen
Age:
73 yrs

Sports/Events:
triathlon, running, swimming - present
golf, tennis, squash, waterpolo, volleyball, swimming - past

Occupation:
Past: Air Force (RAAF) - 30 years
Present: Part time flying instructor (civil)

What do you enjoy about masters sport?
The friendship of other athletes. The satisfaction of doing well. The enjoyment of training with other athletes early in the morning in perfect conditions.

What motivates you to participate?
To maintain the highest level of fitness as possible. To achieve the goals that I set. To win.

How do you keep yourself motivated?
By always looking ahead and goal setting and looking forward to the next event, also sport is now a way of life.

Favourite training session?:
A long steady bike training session with friends. A training swim at Kona, Hawaii.

How often do you train?:
Usually twice a day, six days/week.

Do you train under a coach, with a group of friends, or by yourself? Why?
Partly with friends and sometimes by myself. As I work on an ad hoc basis I cannot adhere to a structured training program.

Person(s) most admired and why?:
Dave Scott (triathlete) - because he is the epitome of a masters athlete and a true gentlemen.
Brig. Gen. Robin Olds (USAF) top fighter ace. He is a born leader of men, a friend and also a gentlemen.

Other interests/hobbies:
Music from the 40's and the golden age of swing.
Good books on aviation or athletics.

Highest achievement in Sport:
Winning my age group in Hawaii Ironman in 1987, 1988 and 1992. Winning the 65-69 age group in Triathlon World Championships in 1991.

Favourite event and best time:
World Cup Triathlon (now called S.P.I.T)-3 hrs 52 mins 12 secs

Your most memorable moment in sport:
When I first won the 60+ age group in the Hawaii Ironman in 1987.

Favourite movie:
Top Gun, Star Trek, Westerns

Favourite book:
Flanagans Run by Tom McNab

Favourite 'bad' foods:
Any food salty or spicy and fast foods

Favourite 'good' foods:
Fruit salad, steamed vegetables, fish and kangaroo steak

Philosophy on life:
To try and keep fit and enjoy life. To try and help and encourage other mature age people, particularly ladies, to take up exercise.

Advice to masters athletes wanting to improve:
Keep a positive attitude - you will have good days and days which are not so good. If you do the work you will have success - but do not *overtrain*.

Other Comments:
Age is just a state of mind. When it comes to exercise, with the correct diet and athletic training program, the athletic goals are limitless.

Never Assume Correct Rigging

© by Bob Bleakley

We spend so much time working out training programs, improving technique, watching what we eat and developing appropriate mental skills, but too often compete with rigging that detracts from performance

Bob Bleakley

More change has occurred in the last five years with the advent of cleaver blades, than in the entire history of rowing. It is no coincidence that in coxless fours we now have a situation where lightweights at World Championship level, perform on a par with heavyweights.

At the time of writing, I have just returned from the first Olympic selection trials over 5 km at Penrith. I watched with dismay one of the top heavyweight scullers come down the course washing-out badly on stroke side. This might well have cost him 10 seconds and second ranking in his category. It is all too easy to adapt to poor rigging.

The problem of course, may have simply been that he was pulling his right hand (bottom hand when sculling left-over-right) down as he finished the stroke. This is a common fault and may have nothing to do with rigging.

■ Practical Rigging Tips

- **Washing out**

As a general rule, apply the "wash-out, lean-out" adage to this problem. In other words, with the boat level horizontally and longitudinally, check that the pin/s has one to two degrees outward lay. In this position, the pitch will close a little from catch to finish, thereby helping you to keep the blade covered right through the stroke. You should always check that you have the desired left-over-right differential between the gates when talking sculling rigging. A good starting point in that regard is 1-1.5 cm.

- **Setting the Pitch**

When checking pitch, always check both sides. It is not uncommon for faulty pitch on one side to cause a problem on the other. In the single scull, I start with a pitch of approximately 15 mm at the catch closing to 12-13 mm at the finish. Some people prefer to have a vertical pin/s which would result in a 15 mm pitch right through the stroke. Both Howard Croker and Jeff Sykes have produced guides to pitching their respective blades.

If you choose to use the simple pitching method of setting the pins vertical using inserts to obtain the desired pitch, a note of caution: check that the blades have the zero or two degrees of pitch that they are supposed to have ex-factory. This can be done by placing the blade, spoon down, on a flat level surface. Then place a pitch gauge across the flat back of the sleeve at the button, to measure the degrees of pitch, if any, that have been built into the blade/s.

- **On the Water**

The first thing I do when someone asks me to look at them on the water is to get them to sit at front chocks with the blades just covered. In this position, I like the arms to be almost parallel to the water. This ensures that all of the forces generated by the leg drive, body-open and arm pull are applied in a horizontal plane. A further important consideration in relation to horizontal drive is knee-height at front chocks. The optimum position is no higher than mid-chest height. The shins should be either vertical or slightly less than vertical. I prefer the latter, particularly in big boats, such as quads or eights where you are endeavouring to generate a very steep force curve (acceleration) off the catch. I then ask the person to sit at back chocks, with the knees down flat, again with the blades just covered. The handle height should be just at the bottom of the rib cage in both sweep and sculling. In sculling, the handles should be approximately 20 cm apart.

- **Take a Video**

Have someone take a video of you rowing so that you can gauge for yourself how much arc is forward and aft of square off. The ratio should be approximately two-thirds forward and one-third aft. If your blades are entering the water at less than 45 degrees to square off, you are too short. You should reassess where your seat is relative to the pins at the point of entry. In some extreme cases you may have to modify your riggers to attain the desired pin position (see Fig. 1).

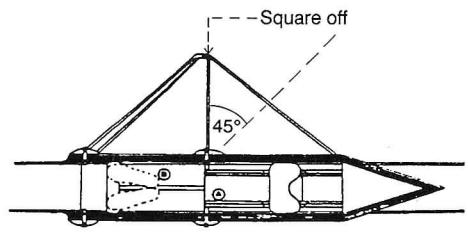


***Figure 1:** The square off position with a forward arc of 45 degrees.*

You may also have to rethink you length, inboard and spread.

To reduce gearing to a formula is not very meaningful with cleaver blades. I say this because, we now have blades of differing shape and size with variable shaft stiffness. The best way to determine what is best for you, is to work within tried parameters (see Table 1 on page 8).

- **A final note**

You also have to put yourself to the test over the race distance. Your ability to generate good handle speed at an appropriate rating for your boat category without getting rating on the slide, is the ultimate test as to whether you have the correct gearing.

Finally, once you believe you have the correct rigging configuration for your height, body shape and strength, record all of the measurements in figures 2 and 3 (page 8) for sculling and sweep, respectively for future reference.

One further practical measure, particularly when changing boats, is the distance from a line (use a piece of string) drawn across the

continued on Page 8...

SWIMMING

Tapering for Success

© by Dr Peter Reaburn

Successful performance on the "big day" is a culmination of a lot of hard work and commitment. However, it's those last few weeks prior to the major meet that are so important to maximising the hours of training. On the assumption that the work has been put in, the taper is the key to that PB.

In 1990, well-respected sports scientist and masters swimmer, David Costill studied two groups of younger swimmers over a 24-week training period, with the groups doing different training over weeks 5-11. During this period, one group trained twice a day (10,000m), the other group once a day for 5,000m. Both groups demonstrated similar physiological and performance gains. Importantly, the group covering the 10,000m per day declined significantly in sprinting ability. However, a significant improvement in sprint times occurred in both groups with a taper over four weeks.

This improvement is probably due to a 17.7-24.6% improvement in arm power that has been previously seen in swimmers who dropped training volume from 9,000m per day to 2,700m per day for a three-week period. Taken together, these results from scientific studies suggest that periods of intense training reduce muscle power and strength which reduce sprint ability. Conversely, **reducing training volume, but maintaining intensity, improves swim performance** across all events from 50-1500m.

Most elite swimmers and coaches reduce training volume gradually or suddenly over a period of 2-3 weeks leading up to a major meet. Some swimmers and coaches find a gradual reduction in volume works. Conversely, particularly in overtrained or fatigued swimmers, a sudden drop to a third of training volume may benefit some swimmers.

Research in younger swimmers has shown that whether they drop from 10,000m to 3,000m per day or 5,000m to 2000m per day over a 15-day period, there is no loss in aerobic capacity or endurance performance and an improvement in sprint ability.

While volume (kms) is gradually reduced, training intensity or speed should be maintained. Indeed, a recent study found that young middle distance runners significantly improved their performance times by sharply reducing their training volume while maintaining or increasing their training intensity seven days before a race. This taper method was superior to both a reduction in training intensity and total rest in the week prior to competition. It is generally accepted that the longer the athlete has been training for, the longer the taper can be. However, if training duration has been short, then a "drop dead" taper of 2-3 days where volume is dropped dramatically might be recommended.

The usual practice is to do one major taper (2-3 weeks) per season although some sports scientists suggest 2-4 may be possible within a training year. Minor tapers (3-7 days) may be done leading up to an important meet or event. These minor tapers allow you to freshen up regularly and if you perform well at a meet, to give yourself that all-important psychological boost for a PB.

The available research and anecdotal evidence suggests that athletes are able to hold peak performance over 7-10 days without additional training. Masters swimmers that maintain all-year round training appear to be better able to hold performance over this period compared to swimmers who only train in summer or part of the year.

The available research strongly suggests the need to reduce training volume (kms per week). Do we drop the number of days per week, the speed, or the distance covered per session? A 1989 study examined these variables in young American swimmers. Groups who maintained frequency of six days per week and swam 10-15% of their work at high intensity maintained their best performances. This was maintained even when the duration of training was reduced by two-thirds. However, the groups that dropped training frequency by two-thirds from six to three days per week decreased performances, even though they maintained training duration and intensities. In summary, these results suggest maintaining training frequency and intensity, but dropping volume (kms) per session.

During the taper period, for both endurance and speed swimmers, more recovery sessions should be programmed and nutritional procedures such as carbohydrate loading emphasised. For those of us who compete regularly (swim meets, open water swims, triathlon teams, surf carnivals), recovery and lower intensity training sessions should be programmed early in the next week to allow sufficient recovery from the race(s). The main training session is performed midweek (moderate to high intensity and volume), with a brief, quality workout occurring two or three days prior to the next race. Carbohydrate loading should also be emphasised at this stage of the week. Minor tapers of this nature are designed to allow a "mini peak" for each race throughout the competition season, but it is no easy matter to achieve this every week. Too many of these minor tapers will take time away from quality training. I'd suggest pick the important events (once a month) you want to target and do a minor taper for those while simply training through the other events that you can use as quality training sessions. A major taper should be done prior to a major event (State/Nationals/Worlds).

On the assumption of a major three-week taper, the following peaking guidelines can be used:

Week 1:

- maintain normal training frequency
- endurance swimmers shorten the distance of the main endurance set by 10-20%
- reduce weights workouts to once per week
- include a small amount of sprint work (25-50m) with long rests
- maintain swim intensity

Week 2:

- maintain normal training frequency
- endurance swimmers shorten the distance of the main endurance set by a further 10-20%
- sprinters reduce the number and distance (dramatically) of the endurance sets
- include one-two sprint short sprint sets as per week one
- drop weights work - the sprinting will maintain strength and power
- maintain swim intensity

The Last week:

- maintain normal training frequency
- Practice your race warm-ups (longer, easy swim or set and some quality efforts).
- Reduce total distance and length of sets dramatically.
- Swim broken swims (eg. 200m swimmers swim 4x50m at race pace with 5-10 seconds between 50's).
- Fine tune starts and turns.

Other important issues:

- Because we start to feel fresh during the taper phase, there may be a tendency to do too much speed work to the detriment of our endurance. Remember to be aware that the aim of taper is to reduce training distances - don't do too much quality work!
- As a result of our training volume dropping, we must reduce our calorie intake, otherwise we'll gain fat weight. However, be aware that total body weight may increase slightly. This is due to the the increased glycogen we're storing in those previously depleted muscles needing water to store those carbo's.
- The taper is the time to feel good. Our heads must be confident that we are swimming strongly during taper and when we do our confidence lifts.
- Distance swimmers (200m plus) need to maintain a greater training volume during taper than sprinters - this is due to the need to maintain aerobic capacity which is harder to maintain than speed.
- Sprinters can have longer tapers than distance swimmers for the above reason.

Finally, the taper is a very individual matter and years of trial and error will enable you to find a taper method that works for you. Try the methods outlined above - they are guidelines only, and do not allow for the wide range of masters swimmers' physiologies, training histories, and events that exist for us. See you on deck - tapered and ready to fire!

Rowing article continued from Page 6...

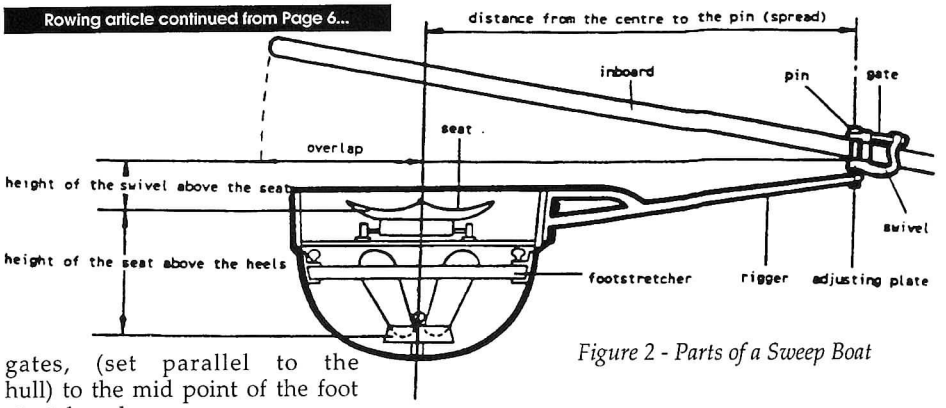


Figure 2 - Parts of a Sweep Boat

gates, (set parallel to the hull) to the mid point of the foot stretcher bar (the fitting to which the shoes or clogs attach in front of or just below the toes).

Rigging is individual. It is very much a matter of trial and error. Correct rigging will have a profound influence on how well you translate work output into speed. It takes time to get it right. Good rowing.

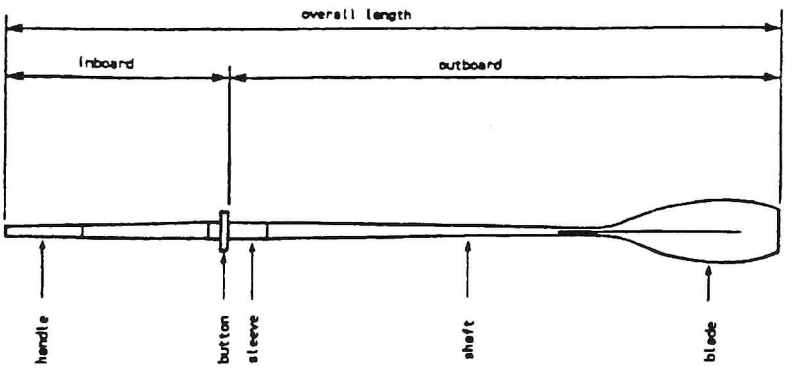


Figure 3 - Parts of the Oar

GENDER	BOAT	OVERALL LENGTH (cm)	INBOARD (cm)	SPREAD (cm)
MEN	8	379	113	83
	4-	378	116	84.5
	2x	376	115	85
	1x	291	88	158
WOMEN	8	376	118	85
	4-	376	117	86
	2x	375	117.5	87
	1x	288	88.5	160

***Table 1:** Cleaver blade measurements, Olympic Regatta (Banyoles)*

Nutrition article continued from Page 5...

that you require is somewhere in the vicinity of 30-60 g per hour (or 0.8-1.0g per kilogram body weight per hour) of exercise. High intensity exercise requires more carbohydrate. It is also important to start consuming carbohydrates and fluids early in the event to maintain your valuable glycogen and fluid stores, as well as avoid gastro-intestinal problems.

■ After exercise

Follow your well-practised recovery guidelines, ensuring you replace your weight with the correct volume of fluid and at least 1g per kilogram body weight in high glycemic index carbohydrates (Issue 3 TMA), before you crack the champagne!

From the Research

Older athletes have bigger hearts

One of the reasons why older people lose endurance capacity is that the amount of blood pumped per beat of the heart (stroke volume) is reduced. Whether the same happens in older endurance athletes remains to be determined. This study compared nine older male athletes (64±2yrs) and nine healthy non-exercisers (63±1yrs) on the following - aerobic capacity (VO2max), stroke volume, and blood pressure responses to gradually increasing exercise intensity on a treadmill. The older athlete's aerobic capacity was almost double (50.4±1.7 ml/kg/min) that of the non-athletes (29.6±1.4 ml/kg/min). While the blood pressure responses at rest and during exercise were not different between the groups, the amount of blood pumped per beat at maximal exercise was dramatically greater in the older athletes. The stroke volumes of the athletes was 132±6mL, while in the non-athletes it was 111±6mL. This important adaptation to endurance training means that older endurance athletes can pump more blood, and therefore more oxygen per heart beat, to the working muscles.

From: "Enhanced left ventricular performance in endurance-trained older men" Circulation, Vol 89(1), 198-205 1994.

Get Set!

Calendar of Events

MARCH 9 - 17 1996
Australian Veteran Games
Wagga Wagga, NSW
Contact: 069 235428

MARCH 19 - 30 1996
Riverland Masters Games
Renmark, South Australia
Contact: 08 438775

APRIL 5-8 1996
AUSSI Masters National Swim
Canberra
Contact: (06) 254 5345

APRIL 5-8 1996
National Track and Field Championships
of Aust. Assoc. of Veterans' Athletic Clubs
Perth
Contact: (09) 310 2736; (09) 447 6898

APRIL 13 1996
Norfolk Island Around the Island Relay Classic (36k run/walk)
Norfolk Island
Contact: (672 3) 22115

APRIL 20 -28 1996
Tasmanian Masters Games
Launceston
Contact: 003 346523

JUNE 22 - 27 1996
World Masters Swim
Sheffield, England
Contact: 08 344 1217

JULY 6 - 13 1996
Veterans Oceanic Games
Tahiti
Contact: 08 231 5399

OCTOBER 3 - 10, 1996
Maryborough Masters Games
Maryborough, Q'ld
Contact: 071 - 237710

OCTOBER 19 - 27 1996
Honda Masters Games
Alice Springs, N.T.
Contact: 1800 658951

OCTOBER 26 - NOV 3 1996
Queensland Masters Games
Gold Coast, Qld.
Contact: 07 5581 6052

FEBRUARY 1 - 9 1997
New Zealand Masters Games
Wanganue, N.Z.
Contact: +64 6 345 4555

RUNNING

Tapering and Peaking for the Masters Distance Runner

© by Steve Manning

Many training principles are equally important to masters athletes as they are to younger athletes. However taper ing, peaking and recovery must be approached differently for the masters athlete.

Steve Manning

The most significant change I have found in my training since I was a teenager is my inability to do frequent hard sessions. I get much sorer now after running hard and it takes much longer to recover from these sessions.

As a result, it has become necessary for me to adjust my weekly training routine to allow more recovery after hard efforts. This has also meant the frequency of hard efforts has also decreased.

■ Reversibility

One unusual effect of my change in the training response was my ability to maintain a base level of fitness for a longer period of time. When I was younger it took me a very short time to reach peak form. I could keep up solid training for only three to five weeks but in that time I would be racing at about 95% of my potential. After having a short break from consistent training I would lose my fitness very quickly. After two to three weeks I would be back to zero needing another surge of training before racing at my best again.

Now as an older runner with years of training it takes me much longer to reach a peak of fitness. The difference is I can train more and mate potential is now much better than : once was as a teenager. It also takes onger to lose my base of fitness. Short term injury or illness has little impact on my program. After having two weeks off or longer I am still able to come out and run a race at near to my personal best times.

■ Peaking And Tapering

Tapering is the act of cutting back on the total training load or quantity before a race with the aim of increasing the amount of recovery achieved. Peaking and sharpening is the simultaneous increase in the intensity of certain sessions while tapering. The tapering of training volume allows the peaking of intensity to occur.

With age comes the inability to train as intensely as when younger. But what we lose in intensity, we make up for with a greater capacity to cope with a high training load. What we lose in the ability to quickly get fit, we gain in the ability to maintain our fitness longer. Unfortunately we remember what we used to be like when younger and often think that we are still the same.

These changes in the bodies response to training, tapering and recovery must be considered when planning your program.

■ Tapering for the big one

Using training for the Q'ld Champs 10000M as an example, let us look at how training changes to achieve a proper peak for this major goal race. The Cross Country and Road season can be used as a training base or preparation phase of around six months. A Transition Phase of up to four weeks prior to the start of the Track season should include getting used to using spikes and running on the track. In the two month pre-competition phase up to Mid December, we should be racing on the track frequently but training through most of the races.

FINAL THREE WEEKS

	SHARPENING
Mon	Easy 8 km
Tue	Speed 6 x 500m, 3 minutes rec
Wed	Easy 10km
Thu	8 x 200m, 200 rec
Fri	Easy 5 km
Sat	Track Race 5000m
Sun	Easy 10km
	SHARPENING
Mon	Easy 5km
Tue	Speed POWER 3 x 1km, max rec
Wed	Steady 10km
Thu	Speed 6 x 200m kick session
Fri	Easy 5km
Sat	Track Race 3000m
Sun	Easy 10km
	PEAKING
Mon	Easy 8km
Tue	8 x 80m Strides+ 1000m TT
Wed	Easy 8km
Thu	OFF
Fri	Easy 5km + strides
Sat	**Qld 10000m Champs**
Sun	Easy 3km

The aim is to learn how to race and try different tactics rather than to go all out in every race for a personal best. One of the main aims of peaking is to rise above your general performance level to do something outstanding and achieve an ultimate performance. This is not possible if you are always trying to race at your best in every race.

During the Christmas break it's important to have kept the training going so that you have something to taper off. I recommend a three to five week preparation phase of increased mileage but decreased intensity before starting on the final competition phase in January. It is in this final period that the best racing performances are achieved. Speed sessions should have been progressively increased in intensity so that you are running at faster than race pace.

It is not necessary to taper before each race as the total drop in quantity should be enough to allow good performances.

The final three week period is the most important. In this time there should be an even greater drop in total mileage with maximum intense efforts at less frequency then before. All of the good training that you have done can be wasted by doing the wrong kind of session at the wrong time. To cope with the maximum intensity sessions there must be fewer repetitions with greater recovery.

I recommend that you try a power session of 3 x 1km with up to 8 minutes recovery. This session pushes your body into a super-compensation state ready for a great race. The ideal time for this type of session is ten days before your race. Any closer and it may detract from your final race performance. The sample program below illustrates how training can be modified in the last few weeks. By following a similar program based on your own goals, ability and experience you can perform at a level that would be impossible without tapering and peaking.

Quotes

"Failure is success if we learn from it."
Malcolm Forbes

"The ancestor of every action is a thought"
Ralph Waldo Emerson

CYCLING

SPINNING TO WIN: How to master the art of pedalling

© by Liz Hepple

What could possibly be difficult about pedalling your bike. I mean all you have to do is simply turn your legs in circles. That has to be easy, right? Wrong! The neuromuscular mechanisms in the body love to generate force in a single direction (as in a simple leg press), but when it comes to constantly changing the direction of force, the brain and muscles get confused. Only hundreds of hours of pedalling practise can help optimise this circular movement.

Liz Hepple

Ideally, your muscles would push the pedals around so that the resultant force is at right angles to the crank. In other words, your legs would force the pedal downwards at the front part of the pedal stroke, pull it back wards and upwards at the bottom and back of the stroke and push it over the top of the stroke. It was previously believed that elite cyclists could actually achieve this perfectly round pedalling. This illusion was shattered when the A.I.S. developed a machine which measured the forces on the pedal during the stroke. It was found that there was constantly a downward force on the pedals, even during the 'pulling up' phase. What separated the Olympians from the recreational cyclists, was that the better cyclists were able to apply less downward force at the back of the stroke.

Given that none of us will ever achieve the perfect pedalling action, the message here is that the closer we get to what is perfect, the faster we will go. The trouble is that in these modern times, so much fuss is made over varied seat positioning, aerodynamic equipment and other technology, that the essence of cycling - the pedalling action - seems to have been overlooked. To achieve optimum pedalling first it is useful to break the action into four components.

■ Pedalling segments

1. 'Top dead centre':

At the top of the pedal stroke, think of dropping your heel slightly and pushing the pedal forward over the top of the stroke, from the 10 o'clock to 1 o'clock position.

2. 'Down stroke'

At the 'front' of the pedal stroke, the force of the pedal stroke is mainly downwards, and this is the segment with the best energy input. It is not really necessary to work specifically on this segment as it comes naturally.

3. 'Bottom dead centre'

At the bottom of the pedal stroke, think of pulling the pedal backwards. This is where the toes come into force and the action is like 'scraping dirt off the bottom of your shoes'.

4. 'Up stroke'

At the 'back' of the pedal stroke, you need to use your hip flexors and hamstrings to 'pull' the pedal upwards. Think of pulling your knees upwards towards your chest, to take the weight off the pedal.

■ Ankle movement

An important part of pedalling is the ankle movement. The foot should perform a fluid up-and-down movement. The heel rises to about 30 degrees from the horizontal during the 'up stroke', then drops so that the foot is almost flat prior to the top dead centre, gradually rising again through the 'down' and 'backward' phases. The slower the pedalling (e.g.: when climbing hills) the lower the heel - the heel will actually drop below the toes prior to the 'top dead centre'. The faster the pedalling (e.g.: sprints) the more the cyclist pedals on their toes. Good ankle mobility is crucial to optimal pedalling, and riders should aim to achieve this fluid 'paddling' movement.

Sample training for working all the pedal segments.

a. Perform 4 x 2 km efforts at slow rpm (eg: climbing a long hill)

Effort
1. Concentrate on working the 'pull back' phase
2. Work the 'pull up' phase
3. Work the 'push over the top' phase
4. Work the entire pedal stroke

b. Perform 8 x 1 km efforts.

- Take one foot out of the pedal and pedal with one foot for 1 km.
- Swap feet, and pedal with the other foot for the next 1 km.
- Repeat this another 2 times, then do the last 2 efforts with both feet in the pedals and concentrate on pulling back and up with one leg, while pushing over and down with the other.
- Gradually increase the pedal rpm through the 8 efforts.

■ Cadence

When I started cycling, I remember being told to learn to 'spin' the pedals fast. We didn't even contemplate using big gears until we had clocked up thousand of kilometers at a high cadence, until the action became automatic. These days, too many people jump on a bike, throw it straight into the big chain ring, and off they go - at an rpm of about 75. While they achieve moderate results quite quickly, they will never pedal efficiently, and therefore will never reach their potential.

The most efficient pedalling rate is 95 to 105 rpm. At this rate the muscles save energy and accumulate the least amount of lactic acid, which is critical for any race. Triathletes in particular have trouble running after the bike ride if they have been pushing a big gear at a low cadence.

However, when you first get on a bike, you are probably most efficient at an rpm of around 55. This is because you don't have the neuromuscular co-ordination to pedal at a high rate. Many beginners avoid working on their cadence because they actually go slower when they pedal a small gear quickly. But by continually training at a higher cadence, your muscles become more efficient at pedalling at this optimal rate, and in the long run yc achieve much better results.

Sample training for cadence

Whenever you are on your bike you should spend at least some part of the ride focussing on your pedalling technique. In the early part of the season, or if you are just starting out, you should do at least one session per week where you are specifically working on cadence. Some examples are as follows:

1. Do one weekly ride on flat to undulating roads where you maintain a high rpm the whole ride. Maintain a high cadence on gradual hills. When you ride downhill, 'spin' your pedals as quickly as possible, while keeping your hips perfectly still on the seat.

2. Do one weekly session of 5 x 2 km efforts (2 kms recovery) and 1 x 10 km effort at the highest cadence you can maintain. Start at about 85 rpm and build up until you can rev at over 120 rpm. Do the shorter efforts on a slight downhill or with a tailwind if possible.

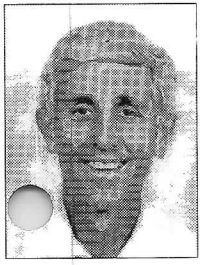
Learning how to pedal properly takes time as the circular movement is not a natural action. However, if you patiently work on achi optimal force production at a fairly high cade you will reap the rewards in the end.

TRIATHLON

The Importance Of Recovery In Triathlon Training

© by Greg Reddan

I remember in 1982 training about 500km cycling, 110 km running and only 12km swimming per week for my second attempt in Hawaii, whilst holding down a full-time job teaching! I only swam three times per week as the nearest heated pool was 30km distant but they were quality sessions. Many friends told me how tired I looked, but I ignored their comments and pressed on counting down the weeks to the taper.



Greg Reddan

The end result in the race was a worse performance overall, but my swim time was 5 minutes faster over 3.8km! I was very depressed post-race- if only I had the knowledge that follows in this article!

Years ago we rarely considered recovery until 'race-time' arrived. We'd taper for a period ranging from three days to two weeks and hopefully allow ourselves to peak and perform at our best.

Historically, Forbes Carlile tested Olympic swimmers in 1960 for changes in their ECG patterns as a result of heavy training and noted how these returned to normal after rest. One wonders how many athletes were overtrained and failed to recover and benefit from training sessions. Today, one of the leaders in Australia in the area of recovery is Angie Calder. She believes that recovery has to be considered part of the overall training plan to ensure adaptation and regeneration. Indeed, the old eastern bloc countries spend up to 1/3 of their available time on recovery.

Individuals vary considerably in their response and recovery to similar training loads. Some of the signs and symptoms of overtraining as outlined by Calder are listed in Table 1:

PHYSIOLOGICAL	PSYCHOLOGICAL
Increased muscular tension	Disturbed sleep
" " tenderness	Irritability
" susceptibility to illness	Increased anxiety
" fatigue - lower tolerance	" fatigue
Decreased appetite	Listlessness
" energy level	
Elevated resting heart rate	

N.B. Some of these follow heavy and intense workloads even though a classic overtraining state has not been reached.

Table 1: Signs and symptoms of overtraining.

How many age-group triathletes display these signs and symptoms? The original triathlons were ultra-distance events (e.g. Hawaiian Ironman) and the approach to training was "more is better" with little concern for recovery or quality of training.

When we train, we place a load on the body resulting in fatigue. If sufficient recovery is given, overcompensation occurs and improvement results. This is termed the "training effect" and the purpose of training is to produce as many training effects as possible. Effective training allows time for recovery and overcompensation.

Two leading sports scientists, Rushall and Pyke, state: "to train without allowing recovery from previous fatiguing work does not produce any benefit to athletes, for they merely learn to cope with fatigue rather than improving in specific aspects of performance". Does this ring a bell? Are you simply coping or are you improving?

Our recovery rate determines the rate at which training can progress. Individual differences affect recovery rate and thus we need to plan for the recovery rate of each individual. Rushall and Pyke comment: "If recovery between successive training stimuli and sessions is inadequate, fatigue will accumulate and adaptive training processes will not be evident." This produces delayed adaptation, a decline in performance and the possibility of injury and/or illness.

Janssen, in his text 'Training Lactate Pulse Rate' notes "the benefits of heavy training in a period of insufficient recovery is always negative. Improvement of the physical conditioning does not take place and the level of performance drops. Any extra training at a moment when incomplete recovery is noticed will in the long run lead to overloading and overtraining. When the morning pulse is 10 beats higher than normal, this is an indication that recovery is incomplete, and the pulse rate at anaerobic threshold and maximum vary as well, settling at a lower level." Thus, measur-

continued on Page 12...

Triathlon article continued from Page 11...

ing pulse rate each morning is useful and the use of a heart rate monitor can signify overtraining if you are unable to reach his normal training heart rate. If you find you are unable to get to a pre-determined threshold, it would be sensible to have an extra day's rest or change the session to easy recovery.

Calder suggests four major categories of recovery methods.

1) Work/Rest ratios, including light active recovery.
2) Nutrition.
3) Physical therapies.
4) Psych-Regulatory Training (PRT).

1. WORK/REST RATIOS

These vary depending on the workload for each session and can be altered within the session, after the session, and between sessions. Also allowances can be made within each microcycle(week), macrocycle (month), or phase. For example, recovery may be included on hard day- easy day basis; hard week-easy week; an easy week every fourth week; passive rest day each week. After many years of trial and error, I have found the following pattern suitable for a well-trained master's triathlete:

	A.M.	P.M.
Monday	Swim (Hard/Long)	Run (Easy)
Tuesday	Bike (Hard/Long)	Swim (Easy)
Wednesday	Bike (Easy)	Run (Easy)
Thursday	Run (Hard/Long)	Swim (Easy)
Friday	Bike (Easy)	REST
Saturday	Swim (Hard/Long)	REST
Sunday	Bike (Hard/Long)	Run (Easy)

N.B. Every second week these are combined into a 'brick' session.

This pattern allows four swims (two hard and two easy), four bikes (two hard and two easy), and four runs (one hard and three easy). Running requires longer recovery than swimming and cycling. The upper body is loaded on Monday and Saturday, whilst the lower body is stressed on Tuesday, Thursday and Sunday. Wednesday and Friday are basically active recovery days. A similar pattern can be established for nine sessions per week by making Wednesday a complete rest day and eliminating the Thursday swim.

2. NUTRITION

Triathletes require food not only for energy, but also for repair and maintaining a strong immune system. Triathletes need a diet of about 70% carbohydrate to provide sufficient energy and food rich in carbohydrate should be consumed within two hours of a training session to maximise recovery (see Issue 3 of TMA).

Fluid balance is also important in preventing fatigue and assists triathletes maintain the intensity of a training session, as well as assisting recovery. Triathletes introduced the use of the water bottle in swim and run training which is now commonplace. We need to ensure sufficient fluid is consumed to maintain clear urine - this can be a problem when we have to train or race in the heat and needs to be constantly monitored.

All athletes require a well-balanced diet containing servings from all major food groups - meat, fish and poultry; dairy products; fruits and vegetables; breads and cereals. Protein is essential for muscle regeneration and the prevention of exercise-related anaemia.

Antioxidants such as Vitamins A,C and E protect athletes against the action of free radicals which affect the immune system and white cell production. Dietary supplementation of these vitamins may assist triathletes maintain heavy training loads.

Calder states that minerals are important for muscle regeneration. Muscle cell damage can result from strenuous training or alter the balance of sodium, potassium and magnesium which may lead to overtraining. Extra intake of minerals and trace elements may assist recovery, but should occur as increased dietary sources, rather than synthetic supplementation due to reactivity in the gut. Iron intake is particularly important and ferritin levels should be checked regularly.

3. PHYSICAL THERAPIES

The following have been found useful in accelerating recovery and should be incorporated into a training program wherever possible:

a) Hydrotherapies - baths, spas, whirlpools, showers, floatation tanks, saunas.
b) Sports Massage.
c) Acupressure/acupuncture.
d) Physiotherapy modalities - ultrasound, interferential.

4. PSYCHO-REGULATORY TRAINING (PRT)

Triathletes may find the use of PRT can assist recovery. Examples are breathing practices, muscle relaxation, meditation , flotation tanks, relaxation massage, music, 'light' therapies. These help the athlete to recover their emotional and psychological state following stress. Some can be used daily and others once or twice per week. Many triathletes tend to omit this area and constantly try to fit in as many physical training sessions as possible without allowing regeneration of their psychological state. If this occurs on top of job and family demands, the triathlete may end up 'stressed-out' and losing interest in training.

SUMMARY

Hellemans suggests a number of other strategies to enhance recovery:

a) Do some basic conditioning through gle discipline before starting a tri training program.
b) Reduce weight to within 6 kg. of ideal weight using low intensity aerobic sessions.
c) Plan ahead taking other commitments into consideration e.g.family, work.
d) Be consistent in applying the training plan.
   i) Set a minimum of six weeks preparation.
   ii) Be gradual in increasing the training load.
   iii) Distinguish between aerobic and anaerobic training (anaerobic training should be preceded by 4-6 weeks of aerobic training).
   iv) Three harder weeks should be followed by one easy recovery week.
   v) Anaerobic training should not exceed 30-40 minutes per session.
   vi) Train with a heart rate monitor to check the level of intensity.
   vii) A period of anaerobic training should not exceed 6-8 weeks.
   viii) Vary the content of training sessions to prevent boredom.
   ix) Monitor for signs of overtraining.

Finally, recover effectively, seize the day and you will maximise your enjoyment of the sport.