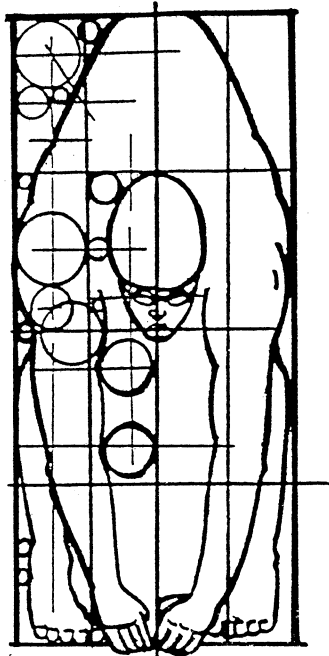




AUSTRALIAN MASTERS SWIMMING COACHES NEWSLETTER

VOLUME 1 NUMBER 5

AUGUST 1989

Our newsletter continues to grow and expand with new subscriptions arriving daily. It is pleasing to see the branches promoting it, and clubs supporting it. The 'Will it or won't it' survive question seems to have resolved itself by your show of confidence.

Numerous contributions have arrived this month with a seminar and Favourite Workouts coming from S.A. coaching Director Lynda Lehmann. Also a report on an Official's Workshop from Victoria's Coaching Director, Ted Tulberg, which you can read on page one.

Kay Cox has kindly given permission to reprint 3 articles that were written by her for the W.A. Branch coaches news letter. She has reviewed a marvellous book on page 14 that would make a valuable addition to any library. On p.15 she has detailed some ideas for coaches to incorporate into their winter program, and information on cold water and swimming is given on page 24.

Our series from the World Master's Games continues on p5, with an article relevant to all coaches of adults.

The Second Australian Master's Games are rapidly approaching in October and it is time to think of that rather hit or miss time, the taper. A succinct summery on tapering written by George Bole (many of you may have heard George speak at his I.M. seminar in Brisbane) and reprinted with permission from the M.A.C.A. newsletter on page 21.

Other articles include individualizing training via the use of cruise intervals, and information on the treatment of swimmer's shoulder.

Thanks to all who contributed to this edition and I look forward to seeing you all in Adelaide.

ANITA KILLMIER

NATIONAL COACHING DIRECTOR

AUSTRALIAN MASTERS SWIMMING COACHES NEWSLETTER

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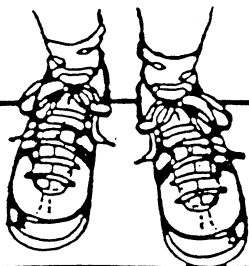
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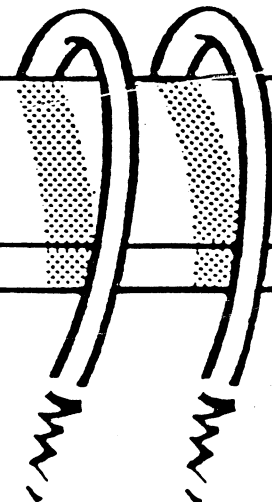
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AUSSI (VICTORIA) OFFICIALS WORKSHOP



HELD SUNDAY 23RD JULY 1989 AT 1.30PM.

VENUE - SYNDAL SWIM CENTRE

A very informative and interesting presentation of the role and duties of Officials at a swim meet was given by Peter Foard and his very able side kick, Alan Davis. Both are very experienced referees. Peter is also the President of Swimming Victoria, while Alan is a long service member of AUSSI.

While there were 24 in attendance it was disappointing that they only represented 3 clubs.

Peter ran the first session on Timekeeping as a practical demonstration using a group of swimmers provided for the occasion. Peter showed he had lost none of his parental enthusiasm for cheering the swimmer in, while Margaret Cunningham wished she had brought a raincoat.

The importance of this position was highlighted and the many operational rules which ensure that it is done efficiently were presented in a fun way.

The next main position covered was that of Judging with again practical application at poolside. Even Peter could not pick the first result which was set up by Alan and Ted with the assistance of the junior swimmers provided by Highburn A.S.C.. Other positions of Announcer, Chief Timekeeper, Turn Judge, Starter, Marshall and Referee were covered to a lesser extent mainly due to time constraints.

While no definite plans have been made by AUSSI towards their own Officials (and we should not rely on Swimming Victoria for total assistance in this area), it is in our interests to ensure our members who are filling the Officials positions are doing so in the correct manner, and to the advantage of the swimmer.

TED TULBERG

VICTORIA COACHING DIRECTOR

EDITOR'S NOTE; Congratulations to Ted on making this move toward making our organisation more autonomous. It would be nice to see the other states following suit.

The following information was handed out at the workshop and is reprinted for your benefit.

TIMEKEEPING

1. Report to the Referee-in-charge or Chief Timekeeper 30 minutes before the start of the meet.
2. Be sure you are equipped - watch, pens, program.
3. Check your watch to see that it works.
4. Always use index finger to start the watch, the thumb is less reactive.
5. Watch for the flash or smoke from the gun, especially for 50m races as light travels faster than sound.
6. After the start check that your watch is running.
7. It is your job to see the start, if you can't, move.
8. At the finish of the race stand directly over the end of the pool lane so you can see the wall.
9. Stop the watch when any part of the competitor touches the wall.
10. Immediately return to your seat after the finish of your lane.
11. Record your time on the card AND the program.
12. Show your watch time to your fellow Timekeeper.
13. The official time for 3 different times is the middle time, for 2 equal times and 1 different take the equal time, and for two different times take the slower time.
14. If you have any difficulties see the Chief Timekeeper.

15. If the swimmer, in your opinion, does not touch the wall at the end of the race, you do not say anything to the swimmer and you stop your watch at the Referee's whistle for the swimmer to leave the pool. You can record on the card alongside the time, D.N.T. or note.
16. THREE TIMES ARE NEEDED FOR A RECORD TO BE ACCEPTED.
17. Watches are returned to zero either on instruction from the Chief Timekeeper or when the whistle is blown at the start of the next race.
18. If you fail to start your watch at the start, tell the Chief Timekeeper and get a start from his watch. Replace with a reserve Timekeeper or place in a lane not likely to get a record.
19. Chief Timekeeper and Referee have the right to look at your time.
20. Should a swimmer request the time before the official time is announced, give an approximate time e.g. 1.42+ ,as the official time may be adjusted.
21. Do not talk to the competitor - it may break his/her concentration.

THE CHIEF LANE TIMEKEEPERS DUTIES ARE

1. Check and record data on the card.
2. Tick the official manual time.
3. Ensure the card is collected.
4. Report any problems to the Chief Timekeeper
5. Provide information to the "trainees".

DUTIES OF THE CHIEF TIMEKEEPER ARE

1. Inform Timekeepers of the method of starting.
2. Allocate Timekeepers to lanes, appoint Chief Lane Timekeeper.
3. Check all watches for accuracy in accordance with recommended procedure.
Period = longest race on the program.
4. Instruct Timekeepers of procedures in case of watch failure.
5. Advise timekeepers to read watch several times in all events.
6. Inspect watches of lane timekeepers where considered necessary.
7. Check time of first place-getter or possible record breaker.
8. To deal with any problem encountered by lane timekeepers.
9. To ensure that time-slips/cards are delivered to compilers.
10. To ensure that trainee timekeepers receive proper instruction.
11. Move along and observe, don't let lane timekeepers obstruct judges view with clipboards etc..
12. Inform timekeepers when splits are required.

COACHING AND COMMUNICATING By Bonnie Durdy

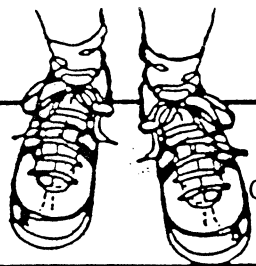
No sound is made unless there is a receiver. A falling tree in the forest makes no sound unless there is someone or something to pick up the sound.

Many swimmers practice incorrect stroke mechanics due to a miscommunication from their coaches. Even though the swimmer is often at fault for misinterpreting the skill to be performed, occasionally at fault is the coach who must have the ability to perceive how well the directions are being received.

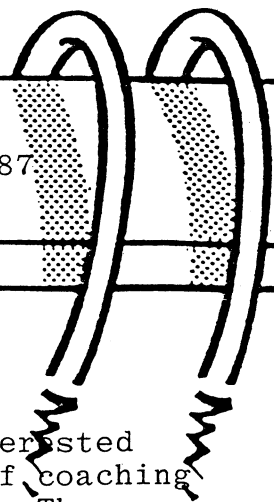
Miscommunications can occur when;

1. The direction has been given to a group (i.e. a general stroke correction) where each individual may require a completely different set of directions in order to correct his/her particular fault.
2. The coach demonstrates the stroke from a standing position on the deck, illustrating the stroke relative to a horizontal position rather than relative to his actual body position. In other words, if a dryland demonstration is to be effective, the coach should be sure that the swimmer receiving the information is aware of the relative position of the arm in relation to the body.
3. The coach tells the swimmer what he is doing wrong without explaining the proper mechanics necessary to correct the fault.

Reprinted with permission from M.A.C.A. Newsletter.



COACHING SEMINAR HELD BY THE S.A. BRANCH MAY, 1987



A one-day seminar was held for AUSSI coaches and interested people with the purpose of introducing the concept of coaching accreditation for AUSSI coaches on a national basis. The seminar speakers were chosen to stimulate interest in better coaching standards for all levels of AUSSI swimming and to stimulate interest in future coaching courses.

The following articles (to appear in each edition of the AUSSI coaches newsletter) are transcripts from the seminar.

SPEAKER : KIT SIMONS (long term member of AUSSI).

My task today, I think, is to present a practical view of 10 years of AUSSI (in this State).

I have seen an astounding growth in AUSSI in this State, from around 20 to over 800 members today. Increased membership has resulted in continual restructuring of administration to cope with the extra load placed upon the organization. Devising a coaching accreditation scheme was perhaps inevitable to provide for the many requirements and levels of fitness of the many devotees.

The S.A. Branch has had a history of doing its own thing on the national scene and has constantly voted against introducing such a scheme; it has meant that clubs have developed their own talents to provide excellent coaches.

S.A. clubs train several times a week in a club format with formal coaching supervision. Many people have gained valuable experience from coaching adults. I hope these people will want to gain formal qualifications although experience, in my book, is still the best asset a coach can have.

We need to look at the reasons for people to join AUSSI - fitness, social, health, competition, etc.

A diverse range of people come along to training for their various and diverse reasons, from 20 year olds to over 70, and these people need to be put in little boxes (lanes in this case) and looked after. I was fortunate when I started swimming (I wasn't a former swimmer) to be coached by Josie Samson. Josie was not only a world class swimmer and a great coach of adults, she was also a great inspiration to those early swimmers, like myself, who didn't know a lot about swimming.

The main attributes in her long list of coaching skills was her infectious enthusiasm and variety of programmes - she always pulled something out of the hat - no monotony! Her assessment of a person's ability was incredible - you have to be able to sum people up very quickly so that you don't ask them to do something that they can't. Her stroke correction was very good and she knew everyone's best time.

The point is that all these factors have to be considered in some way if you are going to be a good coach, particularly if you have, say, 60 people to worry about - that's a big problem.

There are always new people coming to training with 60-70 there every night. Coaches can't possibly know all of these people. There are some medical dangers that need to be guarded against. There is need to improve this aspect (where a new swimmer comes along to train with a medical problem but doesn't tell anyone). There needs to be a system in place where these sorts of things are noted so that it doesn't all fall to the coach.

I have been taking medication for high blood pressure for some time. I have been in the situation where the coach in charge of the group says "now to improve your fitness you need to raise your heart rate to 160 for a 20 minute period". If I tried to raise my heart rate to 120 it would be very difficult - if I got it up to 160 I'd be in real trouble! We need to be aware of these things. I swim at my own pace - no matter what the coach says. If you are coaching you can't be pushy with everyone and say - "Away you go" - You need to ask them if they are coping O.K. ; if they would like a rest; perhaps swim in a slower lane. It needs an experienced eye.

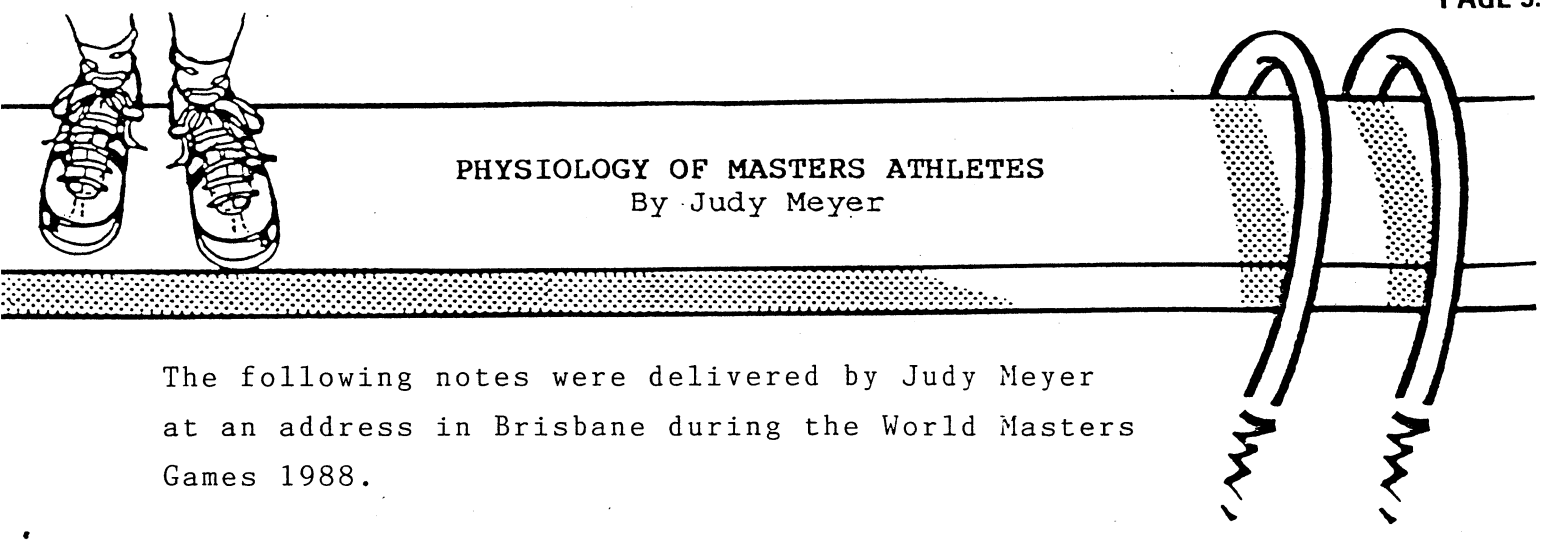
I would hope that the proposed coaching course contains some form of first aid or casualty care.

The AUSSI motto "fitness and fun" is perhaps over used but it is still relevant to adults. We are not here because Mum and Dad want us to be - we are here because we want to be, whatever the reason; enjoyment, fitness, health, social, whatever - we are adults. The job of the coach is to maintain that motivation.

Young, or old, AUSSI has so much to offer - it is all about the quality of life.

LYNDA LEHMANN

S.A. FITNESS AND COACHING DIRECTOR



PHYSIOLOGY OF MASTERS ATHLETES

By Judy Meyer

The following notes were delivered by Judy Meyer at an address in Brisbane during the World Masters Games 1988.

The following is a summary of physiological occurrences that develop in the mature athlete.

I. Cardiac Output

A. Resting pulse rate

It is well established that trained mature athletes have lower resting pulse rates than untrained.

B. Decrease in maximum heart rate (decline at .4 to .95 beats per minute per year) accounts for 30 to 50% of decrease in VO_2 max. Except for swimming, max HR = 220 divided by age² (average for age group, great individual variation, could deviate ± 20 beats/minute).

Swimmers = (205 - age) - Reasons:

1. smaller muscle mass used
2. horizontal body position
3. heart rate slows in cold water

C. Maximum cardiac output, stroke volume and peripheral flow

1. Maximum cardiac output and stroke volume are reduced with age, but in part, can be counteracted by training.
2. There is an increase in peripheral resistance (reduction in elasticity and capacity for vasodilation of arteries and arterioles). This is responsible, for the most part, for the decline in maximum cardiac output and oxygen uptake, rather than the heart's pumping capacity.
3. Number of capillaries per unit is similar in young and old.

D. Blood pressure at rest and during exercise is elevated in aging athletes.

Reasons:

1. reduced muscle mass
2. reduced maximum heart rate
3. reduced elasticity and capacity for vasodilation of arteries and arterioles

E. As in the young athlete, exercise enables the mature athlete to also have a thicker and stronger heart, increasing the size of the ventricles and enabling more blood to fill.

II. VO_2 Max

A. ² Decrease in VO_2 max with age, but if an adult exercises regularly, lung capacity is greater than it would be in a sedentary person. Some studies of those who exercise have a VO_2 max twice as much as their peers or comparable ² to adults 20 to 30 years younger. With regular exercise, instead of the old standard of 10% per decade, the decline in VO_2 max is often only 5% per decade. Some mature athletes maintain their levels of VO_2 max and some even improve when training in mid-life and beyond. Prior training in youth has little advantage. The mature athlete must maintain intensity and volume of training.

B. Breathing capacity

1. Gradual loss of strength in respiratory muscles - approximately 30% decrease between 20 and 60 years of age.
2. Gradual loss of small vessels in lungs and the resistance to flow through small vessels increases.
3. Decrease in surface area for available gas exchange, so capacity for diffusion falls (40% reduction between 20 to 60 years).
4. Arterial oxygen saturation remains at about 95% even at 60 years.
5. Pulmonary gas exchange function improves with exercise in elderly.
6. Exercise increases hemoglobin production, enabling better oxygenation of blood.

III. Muscle Power

A. Specific problems of aging muscular-skeletal system.

1. Decrease in size of muscle mass
Number and size of muscle cells decrease. Peak strength 20 to 30 years. Some studies indicate peak strength does not appear to decrease significantly until late 40's, others say 18-20% loss up to age 60, and more recent studies suggest that there are no major changes in muscle structure and composition until approximately age 70, and then rapid dropoffs in strength are observed only in the older age groups, 80 to 100 years. Results probably depend upon habitual activity and exercise later in life. Part of reduction in muscle fiber is due to loss of functioning motor neurons and simple atrophy of existing fiber types.
2. Less rapid relaxation of antagonistic muscles
3. Loss of elastic tissue

4. Progressive decrease in capillary blood supply to tendons. Note: Muscle tendons, sprains, strains, muscle and tendon ruptures can be common in activity programs for elderly. Walk instead of jog, and use very gradual progression. This is why swimming is best!!
5. Decrease in concentration of myosin ATPase
6. Central nervous system - important
The number of motor units and frequency at which they are activated depends on training. The central nervous system can remove inhibitions, so muscle mass will have more strength.

B. Muscular strength and endurance

1. Muscular strength declines with age. Studies show that mature athletes in their 60's or 70's can have muscular strength equivalent to inactive adults half their ages.
2. Between the ages of 30 and 70, there is a 45 to 60% reduction in Type II fibers (glycolytic fast twitch) and their fiber size.
3. Oxidative enzymes that activate in the muscles of endurance-trained masters athletes are 10 to 15% lower than in young athletes.
4. Age causes a dedifferentiation of muscle fiber to occur.
Muscle fibers become more homogeneously fast or slow. This results in reduced muscle coordination. The latent period, contraction period, relaxation period, and the rate of development of peak tension is reduced as is the absolute maximal tension. Therefore, for the older athlete, the effects of aging are more detrimental for short anaerobic explosive races than for longer aerobic endurance races.
5. Studies support the hypothesis that age differences in performance are due primarily to muscle strength. A correlation has been found between arm strength and swimming speed. There is a high relationship of power to performance in the 24 to 45 age groups ($r = .97$), and only a slight decrease in the same relationship with age ($r = .92$).
 - a. Although the breaststroke has the greatest potential power output (FLY, FR and BK are lower and roughly equal), it is the most efficient mechanically. Freestyle and backstroke have the most efficient application of force. The butterfly, because of the strength necessary to overcome inertia, has the highest load of work and is the most mechanically inefficient.

- b. Greatest decrement in performance in 50-100 yard races with increase in age were in the butterfly.
 - c. Decreased swimming speed in maximal athletic performance that draws on the anaerobic energy system can partially be attributed to muscle strength.
 - d. Maximal working capacity and maximal oxygen intake declines with increasing age, so anaerobic metabolism begins at a lower rate of work in elderly. Also, recovery period following effort is longer.
- 6. Performance records show a decrease of about 1% per year from age 25 to 60, then decline in performance accelerates to 2% per year.
 - 7. Many older swimmers keep improving. Attributed to better teaching techniques, training methods, facilities, etc.

IV. Flexibility

Inactivity is the primary cause of lack of flexibility.

- A. Inactivity is detrimental to the maintenance of healthy connective tissue.
- B. Increase in crosslinking of the fibrous proteins occurs with advancing age.
- C. Joint stiffness increases with age, but is reversible with adequate stretching and exercise programs.
- D. Physical activity helps maintain optimal joint range of motion. Swimming demands most body parts to be moved through a wide range of motion.

V. Technique and Coordination

Could being slow and clumsy result from inactivity? Arthur Rubenstein played technically demanding Chopin when almost 90 years old and Andres Segovia gave a classical guitar concert at age 91. Both practiced several hours per day. Can such training maintain agility?

VI. Body Fat

- A. Active adults delay the accumulation of excess fat that accompanies inactivity during aging, especially endurance athletes.
- B. It is widely recognized that if a person allows his body weight to rise more than a small amount, his life expectancy diminishes.
- C. Progressive decrease in lean body weight reflects some loss of lean tissue and reduced bone mineral content.
- D. Body circumference gets smaller with age (reduction in muscle mass), except abdominal girth (6-16% increase in men, and 25-35% increase in women).

VII. Lactic Acid in Older Persons

- A. Peak lactate values have already been found to be lower in aging adults. It is still unclear if this can be attributed to
 - 1. lesser intramuscular breakdown of glycogen
 - 2. reduction of the ratio of muscle mass to blood volume
 - 3. a slower diffusion of lactic acid out of the active fibers
 - 4. a poorer motivation of swimmers to perform at maximum and a caution of investigators to make them do so.
- B. Peter Reaburn of Australia has hypothesized that aging swimmers will also display later peak blood lactates at a slower rate of removal than younger swimmers. If this is true,
 - 1. aging swimmers may require longer recoveries between sprints or high intensity sets in training.
 - 2. aging swimmers may need longer recoveries between events at meets.
 - 3. aging swimmers may need longer warm downs when training or competing.

VIII. Cardio-respiratory Function

- A. Lungs - flattening or barrel deformity of rib cage modifies thoracic volume.
- B. Wasting of respiratory muscles - thinning of alveolar wall and reduction of pulmonary capillaries.
- C. Loss of elasticity of lung tissue and chest wall
 - 1. increase of residual gas volume
 - 2. equal decrease of vital capacity
 - 3. maximum expiratory ventilation decreases with aging

IX. Bone Loss

- A. Progressive loss of minerals and matrix from bones
- B. Osteoporosis prevalent in older women
- C. Increase in bone calcium and bone growth with exercise

X. Decrease in Stature

- A. Begins around 40, accelerates to 2 cm per decade between 60-80 years old.
- B. Compression of intervertebral discs
- C. Collapse of vertebrae
- D. Increased bowing of vertebral column

XI. Energy Consumption

- A. Caloric intake (averages)
 - Men - 20-39 years - 3000/day; 60-69 years - 2400/kcal
 - Women-20-39 years - 2000/day; 60-69 years - 1700/kcal

XII. Cerebral Function

- A. Vision - progressive reduction in field of vision
(60% of blind are over 60 years of age)
- B. Hearing
 - 1. Progressive deterioration
 - 2. Some elderly hypersensitivity to sound (tinnitus, internally generated noise, confusion)
 - 3. Perform most tasks less quickly than young
 - a. brain less adaptable, harder to switch one bit of information to another
 - b. loss of neurons decreases "channel capacity"
 - c. reaction times - slower (older people fall more frequently)
 - d. progressive death of neurons
 - 4. Long term memory better than young (short term deteriorates)

XIII. Protein synthesis and hormonal regulation of growth and development are altered with aging.

XIV. Sexual Response

- A. In women studied over 60, if anything, sexual response was increased!
- B. Oldest active couple in one study (man - 88, women - 90) Ya-ho!

XV. Why do some people age better than others?

- A. Interplay of physiological, psychological and environmental factors
- B. People with strong family ties and others to support them seem to recover from injury better than those without.

XVI. Previous athletic experience in youth has no real physiological advantage as retraining begins as a mature adult.

XVII. Exercise for Optimum Lifestyle

There appears to be a unanimous agreement among all exercise physiologists that regular exercise is essential for optimum function of the human body. Physical training for the mature adult does not appear to differ very greatly from the young. The rate of adaptation, the recuperation from intense training is slower. Consequently, the risk of injury and overstress is greater.

XVIII. Physical Training for All Ages

- A. Has positive effect on insulin-carbohydrate metabolism interactions which can be important for patients with diabetes or individuals with potential to develop diabetes.

- B. Can increase blood concentration of high density lipoprotein and the ratio of HDL/LDL, which may reduce the risk of developing atherosclerosis.
- C. Releases and elevates the level of beta-endorphins. These neuro hormones have an effect resembling certain opiates and play an important role in general physiological stress reactions, reduce pain, and enhance the feeling of well being.
- D. Helps regulate metabolism and control weight gain.
- E. Has regulatory effect on blood pressure.
- F. Helps prevent loss of bone mass.
- G. May lower concentration of fatty substances in blood that causes atherosclerosis.
- H. Encourages people to follow rules of good health, i.e. eating nutritiously, not smoking.
- I. Usually has a positive psychological impact which gives a person a higher sense of self-esteem.

"INTERNATIONAL SWIMMER" which has been published by Speedo since I was little, and has been of immense support to Australian Swimming, has recently been transferred to a professional publishing house. The result is a much larger, therefore informative magazine covering all facets of swimming, but more important for us, it has a much larger AUSSI content. I feel sure that at least one copy for your Club, circulated amongst your Members, will increase their interest in our wonderful sport, and will help the publication. The more AUSSI readers they have, the more they will include of interest to us. A subscription form is attached.

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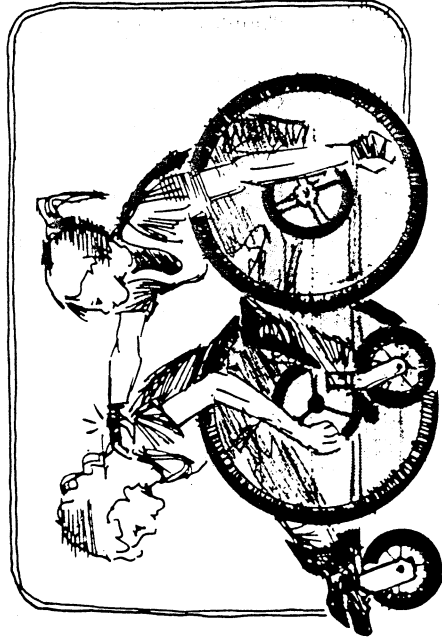
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WHEELCHAIR



A major difficulty which many Australian wheelchair athletes face is the lack of sporting competition and people to train with. Consequently, in parts of Australia very few athletes actually compete. This can create a downfall with self motivation and many will give up. Some involvement with able bodied athletes' training programs would help to resolve this problem.

As an accredited coach, you have an understanding of the basic coaching principles. Coaching someone from a wheelchair will not be all that different.

The same sort of warm up routines, including stretching and drills, similar training programs and of course cool down exercises are required. As with any athlete, the training program must simply be moulded to the athlete's ability.

You can learn from the athlete or from literature, about individual ability levels. Perhaps sit in a chair for a while, throw an implement, try doing usual warm ups, stretches etc.

The rules for most competitive sports are also similar, although there are some changes. Wheelchair athletes and their coaches must be

aware of the rules and regulations as they relate to the chair and wheelchair competition.

WHEELCHAIR SPORT CLASSIFICATION

Paralysis can be caused by trauma — accidents; illness — poliomyelitis; or congenital defects such as spina bifida. Paraplegia results in loss of movement and sensation in the trunk and lower limbs. Quadriplegia (Tetraplegia) involves the greater part of the body including the upper limbs.

For competition, paraplegics and quadriplegics are classified into various groups according to the level of their spinal cord injury.

Each competitor undergoes an extensive neurological examination related to the sport involved and is placed in one of eight classes:

QUADRIPLEGICS

CLASS 1A Weak hand and upper arm muscles.

CLASS 1B Arm and wrist muscles functioning but fingers unable to grasp.

CLASS 1C Arm and wrist muscles functioning, fingers able to grasp but inability to spread the fingers and close them.

PARAPLEGICS

CLASS 2 Impaired balance in sitting position.

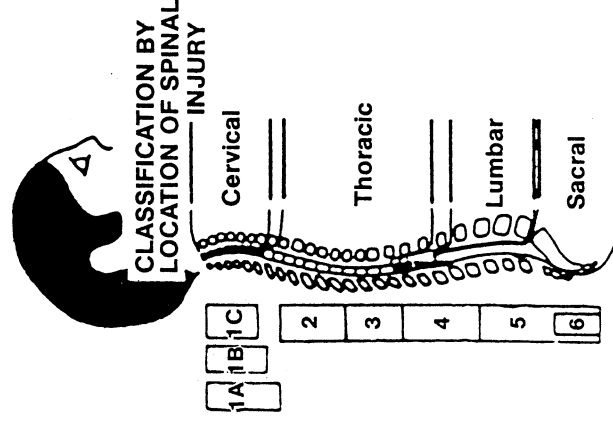
CLASS 3 Good balance in sitting position.

CLASS 4 Thigh muscles not functioning.

CLASS 5 Thigh muscles functioning but hip, knee and ankle muscles not functioning or not functioning optimally.

CLASS 6 The same as in Class 5 but functioning to a greater degree.

Classes 5 and 6 compete together as Class 5, except in swimming.



Basketball: The classification for basketball is specialised. Each player is allotted points on a scale from 1 to 4, with half point categories included. This is based upon the player's spinal cord classification, and the balance and manoeuvrability the athlete has in the wheelchair when on the basketball court.

To prevent an unfair advantage to either team, players totalling a maximum of thirteen and a half points (total team tally) are allowed on the court at any one time. This is important when selecting the team and also in the tactics employed by the coach during the game. Players have a classification card which they must present to the referee's bench before going onto the court.

COACHING TECHNIQUES

If you are, or will be, coaching a wheelchair athlete, there are a number of basic points which should be emphasised:

- Consider the ease of access of your venue e.g. exits, court, locker rooms, light switches, parking, canteen, drink fountains etc.
- Have an understanding of which muscle groups are usable and therefore which movements are possible.
- Strengthen abilities e.g. in sports where the legs normally play the most essential part in the efficiency of performance or movement, a paraplegic must rely entirely on the increased power of the arms and body, increasing strength and muscle endurance as a compensatory function.
- Be adaptive and creative with drills and stretches.
- DON'T underestimate what they can do.

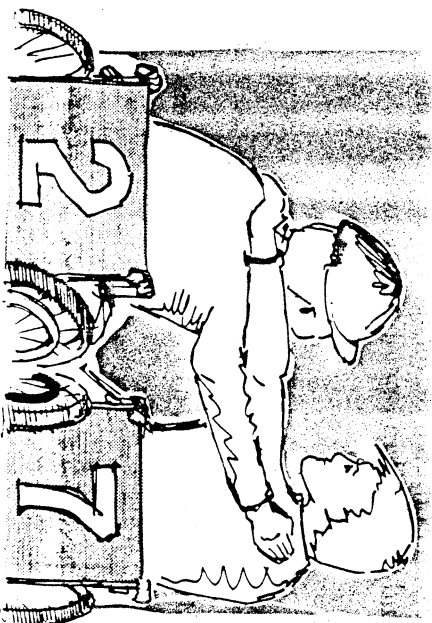
Coaching wheelchair athletes is a challenge. There is limited information available on how to push a track chair, swim without your legs, or play table tennis in a sitting position. So it is up to you to use the knowledge you have of training and techniques and adapt it to fit an athlete in a wheelchair.

If you are working with an athlete in a wheelchair or have the opportunity to coach one in any sport and you need more specific information on modifications to technique or event rules etc, contact:

National Executive Director
Australian Wheelchair Sports Federation
393 Burwood Road
Hawthorn, Vic 3122
Telephone: (03) 818 0297

or

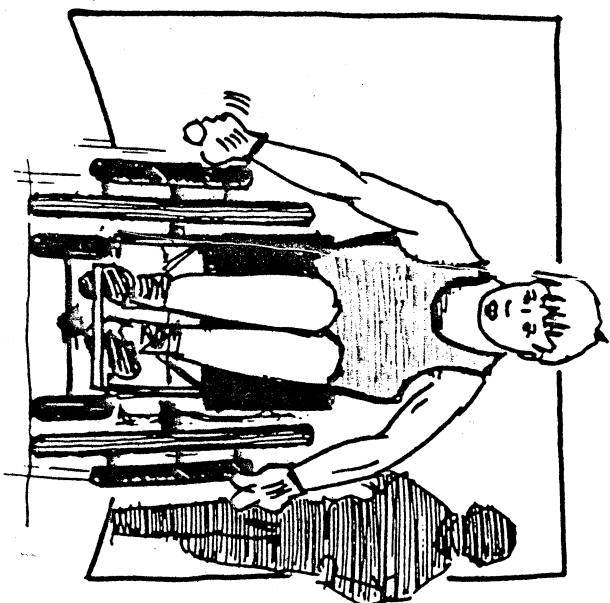
Australian Coaching Council
PO Box 176
Belconnen, ACT 2616
Telephone: (062) 52 1550



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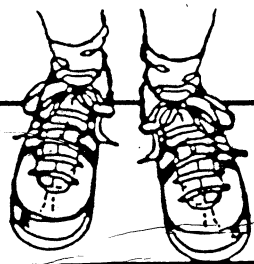
Coaching Athletes with Disabilities



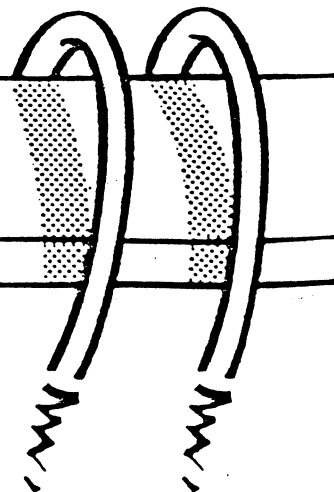
Wheelchair Athletes



Australian Coaching Council
Incorporated



BOOK REVIEW



"THE INCOMPLETE BOOK OF TRAINING GAMES AND GIMMICKS"

BY BOB STEELE - 3RD EDITION

Bob Steele has coached swimming at all levels for over a period of 26 years, and is Technical Director of Domestic Programs for United States Swimming in Colorado Springs. His experience is reflected in this great little book on swimming activities.

Whilst not written for Masters Swimmers, it has some very good ideas that can be applied to training programmes, club nights and special fun events. It is based on the idea of having fun while you are swimming, i.e. - making training fun.

The book contains ideas of games, relays, recording training (I particularly like the idea of using a kick board as an honour board with swimmers names added as they achieve their goals), kicking and pulling activities and different types of time trials.

There are also chapters on special events, which provide motivations for a special day with incentives etc., another on interval training and sprints, and then a section on favourite sets.

This book is a gold mine of ideas, and the author has called the book "The Incomplete Book", because there is always another idea. It also provides coaches with the motivation to look for others and liven up their workouts. A word of warning to the over enthusiastic coach - the workouts and sets will have to be carefully analysed and modified for AUSSI swimmers and cannot just be taken from the book. Thought will need to be given to the level of swimmer, the distance swim, the rest interval and the target time and total distance. However, the ideas are sound and with a little thought, coaches should find this a very convenient handbook to rejuvenate training days. It can also be used by clubs to put fun into club events and by swimmers who want to put more fun into their swimming.

This book is available from the AUSSI WA Branch Library, or for purchase from:

BOB STEELE
UNITED STATES SWIMMING
1750 BOULDER ST
COLORADO SPRINGS
COLORADO 80909 U S A

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WINTER SEASON

Some people see this as the "off season", however some very substantial groundwork can be done during this part of the year. The programme does not need to be intense, but it can still be productive and look at a variety of techniques and drills that often there isn't time for during the summer months.

Coaches must always ask themselves what the swimmer is training for when setting a programme. From here he/she can select the goals and activities that go into a programme. The types of activities for June - October are:

Awards
Long Distance Swim
Learning and improving strokes
Fitness
New Drills

Checklist of Activities

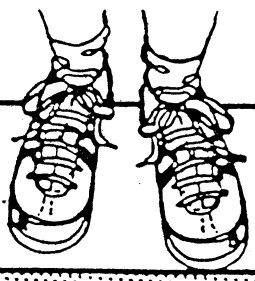
- a. Set a plan of dates for awards
- b. Look at the specific events in the long distance swim
- c. Look at the swimmer's technique, plan changes which may include reteaching a stroke
- d. Winter is the opportunity to try out new drills, e.g. kicking drills, pulling drills, a combination of kicking drills and corrective arm strokes etc.
- e. Experiment with stroking rates
- f. Try some strength or weight training
- g. Add some new flexibility and stretching exercises
- h. Try some new distance combination insets, e.g. 75m, 125m, 150m, 175m etc.
- i. Establish a fitness test now that you can use later on to see any changes etc. 5 min. swim, 10 min, 12 min. swim or at set e.g. - 10 x 100 rest interval 1 minute, or 5 x 200 etc.
- j. With perhaps more pool space try various formations in training, e.g. across the pool, group work etc.
- k. Monitor heart rates and get a good idea of your swimmer's response
- l. Try including medleys in your swims
- m. Include different types of training, e.g. continuous, interval, repetition, speed play etc.

Generally have fun and experiment with ideas. If they don't work then keep the ones that do, and use them to improve your overall programme.

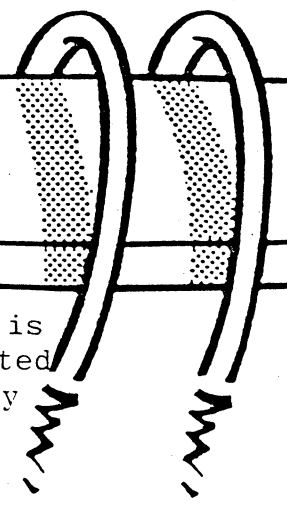
POINTS TO PONDER

Swimmers who are accustomed to hard training in cool pools in the summer need to take care in an overheated pool in the winter. A rise of only 1 degree in body core temperature can cause distress (flushed face, sweating and sometimes dizziness). If your winter water temperature is as high as 30 degrees, coaches should watch for this.

KAY COX, JUNE 1989



CRUISE INTERVALS



One of the best means of individualizing workouts is through the use of cruise intervals. These were originated by U.S. Coach Dick Bower and highlighted in an article by Skip Bird in Swimming Technique Vol. 23 No. 2 issue.

"The cruise interval enables you to better control the practice by regulating the intervals to suit the individuals. It may also help you determine the proper speed and effort for training at or near the anaerobic threshold. It is also valuable because it can help you maximize your endurance training while minimizing the danger of overtraining".

When a set rest interval is given, faster swimmers in any one lane will have more rest than slower swimmers which may result in training a different energy system than the one desired by the coach.

"One additional value of the cruise interval is that you know you are training each swimmer the same, developing the same metabolic system, at least during those parts of the workouts in which you use the cruise interval principles".

Everyone has the same amount of rest regardless of ability.

Bower determines 2 different swimming speeds. A slow cruise speed and a fast cruise speed.

CRUISE SPEED (C.S.) is the speed at which the swimmer must complete the distance. The CRUISE INTERVAL (C.I.) is the cruise speed plus the amount of time you want each swimmer to have. Thereby constituting a send off time suited to each individual.

While Bower uses a number of procedures to establish an individual's cruise speed, the author has found that the easiest and quickest method is to divide a swimmers P.B. 400m. time by 4 to get an average 100m. time. This is the fast cruise speed. Dividing a 1500m. P.B. by 15 will give a slow cruise speed.

Dividing these speeds in half again, or doubling will give 50m. C.S. or 200m. C.S. respectively. for repeats over different distances. E.G. Short rest endurance sets may only have 5-20 secs. rest.

EXAMPLE: Swimmer - P.B. 400m. = 5.20
 $\div 4 = 1.20/100m. = \text{FAST C.S.}$

FAST C.I. = C.S. + 10-15 secs. i.e. 1.30
 P.B.1500 = 21.30

$\div 15 = 1.32/100m. \text{ SLOW C.S.}$

SLOW C.I. = C.S. + 10-15 secs. i.e. 1.45

Shorter sets up to 800m. in length would use the FAST C.I.,
longer sets over 1000m. would use the SLOW C.I.

In this instance the coach wanted swimmers to have a minimum rest period of 10 secs. and a maximum of 15 secs. If the C.S. falls exactly on a 5 sec. increment on the clock, they will get the minimum rest of 10 secs. On the other hand, if the cruise speed falls in the middle of an increment such as our slow C.S. example (1.32) we go up to the next increment (1.35) then add 10 secs. so our C.I. becomes 1.45, allowing this swimmer 13 secs. rest.

Thus rounding off the cruise interval to the nearest 5 second increment helps avoid any confusion when reading the clock.

The author has found endurance sets work best with 10-15 secs. rest. However, the coach could make them more stressful by -

Fast C.I. = C.S. + 5-10 secs.

OR Slow C.I. = C.S. minus 5 secs. etc.

OR Easier

Fast C.I. = C.S. + 15-20 secs.

Speed sets could be performed for a set of 50's by halving your 100m. cruise speed to establish a 50m. cruise speed.

E.G. C.I. = 50m. C.S. + 60 secs.

OR 50m. C.S. on 100m. C.I.

I.e. 40 secs. on 1.30

Many variations are possible with the only limitation being the coach's imagination.

As an endurance set, cruise intervals are an ideal way to teach pacing. Swimmers are to try to hold their C.S. throughout the entire set.

When a swimmer can maintain a faster time than that given and is consistently getting more than 15 secs. rest, the coach can subtract a further 5 secs. from the interval.

E.G. Early season

Slow C.S. C.I. = 1.32 + 10-15 secs. = 1.45

Mid season

C.I. = 1.29 + 10-15 secs. = 1.40

Late season

C.I. = 1.26 + 10-15 secs. = 1.40

When repeated at regular times throughout the season, swimmers and coaches have a visible measure of improvement.

When there is a lack of pool space swimmers should be grouped according to speed and number of repeats lengthened or shortened so all swimmers swim for the same total length of time. E.G.

NOVICE	INTERMEDIATE	ADVANCED
(Swimmers with C.I. greater than 2.10) 10 X 100m. F/S C.I.= Slow C.S. + 10-15 Secs.	(Swimmers with C.I. less than 2.10) 12 X 100m. F/S C.I.= Slow C.S. + 10-15 Secs.	(Swimmers with C.I. less than 1.50) 15 X 100m. F/S C.I.= Slow C.S. + 10-15 Secs.

Those who don't have a current 400m. or 1500m. time are either given a time trial, or matched with a swimmer of similar ability. The interval is then adjusted accordingly.

Coaches are advised that keeping records of swimmers C.S. and C.I. are a good way to show improvement. Heart rates may also be recorded to see how hard or easy the swimmer is doing the set. The easier the set is for the swimmer to attain, the lower the heart rate will be.

The main problem with a lack of lane space will occur when 2 people want to depart on the same interval in the same lane.

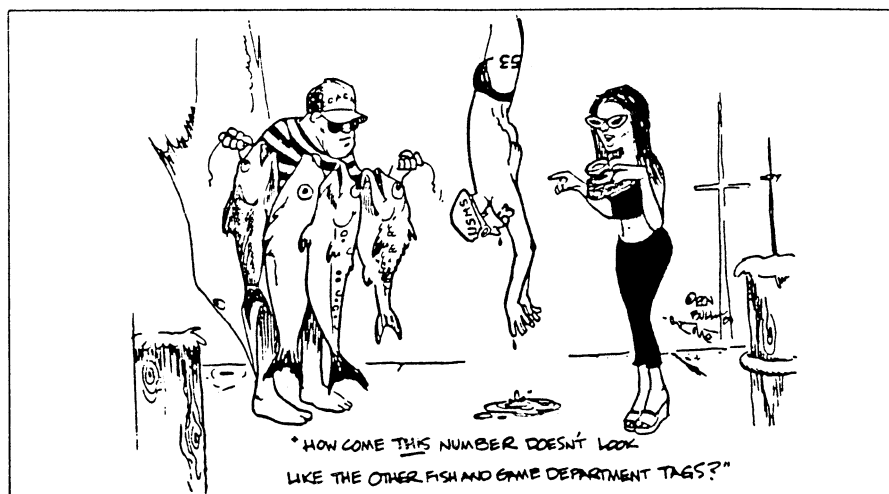
The slower swimmer should always give way to the faster swimmer by departing immediately after the faster swimmer has left.

The author finds adults generally keep interference to a minimum and providing standards don't vary too much in a lane, the set should operate quite smoothly.

Cruise intervals can be performed over all distances and strokes, even incorporating drills and kicking. 15 to 20 minute sets are generally the longest drill that most coaches use.

However, they should not be overused or boredom could ensue. For a well balanced program, practises should integrate all types of training. Cruise Intervals can be a valuable addition to a coaches program.

ANITA KILLMIER



SHOULDER PAIN

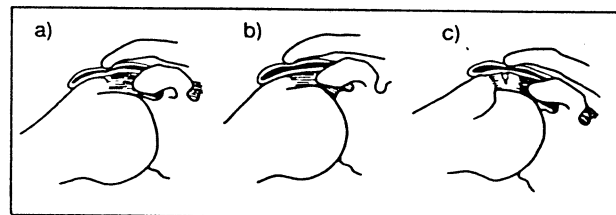
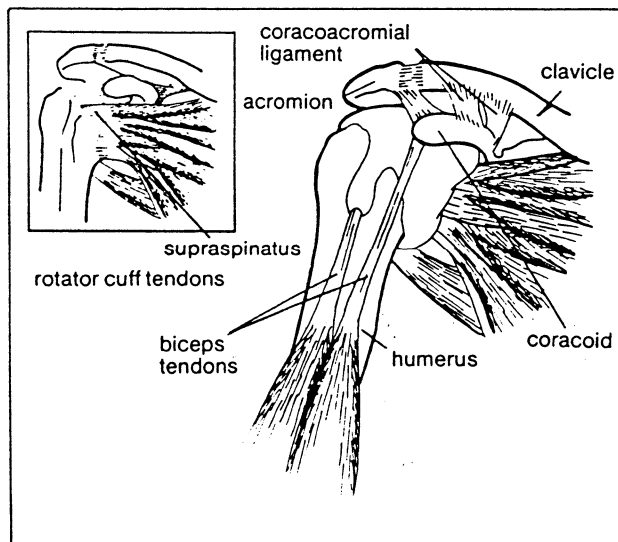
DESCRIPTION

Shoulder pain can be a common complaint to athletes who use their shoulders a lot in a repetitive action, such as swimmers and tennis players. Athletes, however, are not the only ones afflicted with shoulder pain as many occupations can also result in repetitive actions of the shoulder, and lead to shoulder injury. Sudden unaccustomed use can also trigger shoulder problems.

ANATOMY

The shoulder is a highly mobile joint, consisting of 3 bones, a joint capsule, ligaments, tendons and a bursa.

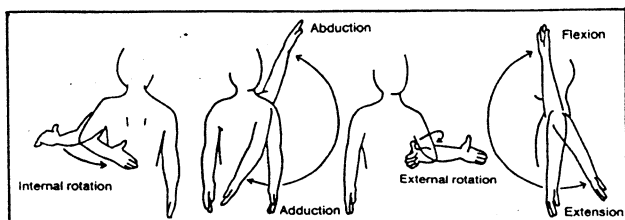
The humerus is acted upon by the various muscles to perform the actions of flexion, extension, abduction, adduction, internal rotation, external rotation and circumduction. In perfect health, it has the greatest range of movement of any of the joints of the body. But each of the constituents of the shoulder is subject to injury, alone or in combination. As well, pain may be referred to the shoulder from the heart, the neck, gallbladder, spleen, etc.



a) bursa and tendon are impinged. b) inflamed bursa and tendon. c) damage to rotator cuff.

CAUSES

1. Overuse, i.e. "wear and tear"
2. Sudden, unaccustomed use, e.g. weekend athlete
3. Injury, such as a direct blow or a fall, causing the onset of inflammation
4. Poor posture
5. Muscle weakness, i.e. lack of fitness



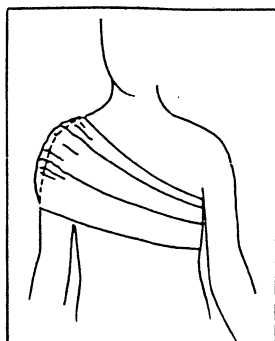
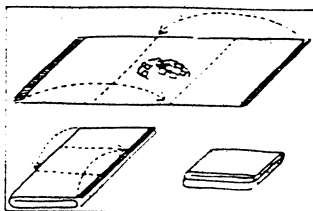
Above: Shoulder movements.

TREATMENT

The aims of treatment are to reduce the inflammation, aid in complete healing and prevent recurrence of the injury.

1. Immediate Treatment — should consist of ice packs, made from crushed ice in a damp towel, applied for 20 minutes, 2-3 times daily

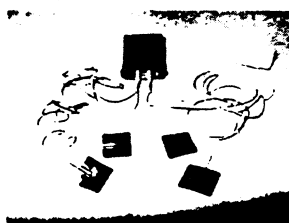
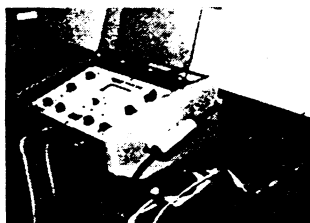
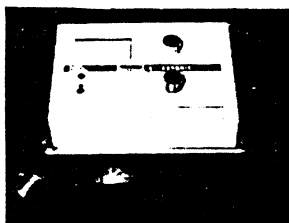
Right: Ice pack. Below: Making an ice pack.



2. Anti-Inflammatory medication may be prescribed and must be taken as directed
3. Physiotherapy — is essential to ensure the return of full shoulder mobility and prevent recurrence of the injury.

Physiotherapy may include one or a combination of the following:

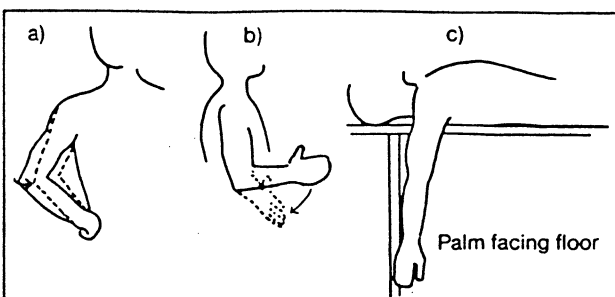
- a) cryotherapy (ice and exercise)
- b) ultrasound
- c) electrical stimulation
- d) electromagnetic therapy
- e) mobilization techniques
- f) stretch and strengthen routines



Above left: Ultrasound. Above: Electrical muscle stimulator. Left: Tens Unit.

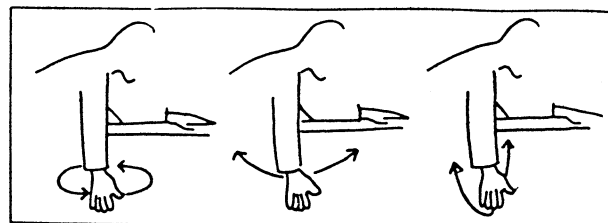
Flexibility exercises can be done twice daily. Each stretch is held, to the point of tightness (NOT PAIN) for at least 10 seconds, up to 60 seconds, and repeated 3 times

- a) hand on hip
- b) external rotation
- c) gravity stretch

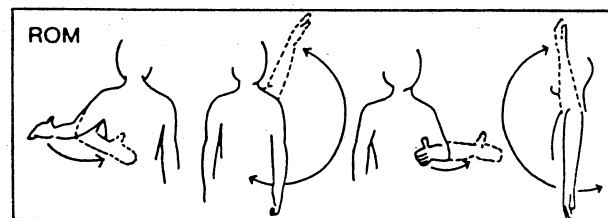
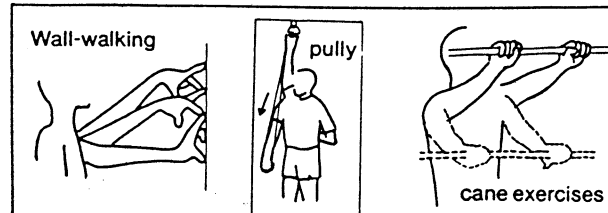


When flexibility is 90% or normal, as compared to the other shoulder, strengthening exercises may begin. Initially, these exercises are done with no resistance and with the assistance of gravity.

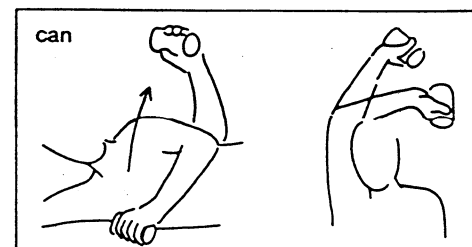
- circles — forward backwards across chest out to side



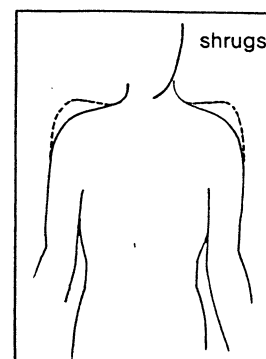
These are done slowly and pain-free. The next progression is stand-up exercises (wall-walking, pulley, range of motion (ROM), cane exercises, can).



When full range of motion has been recovered, concentration should be placed on strengthening the external rotators.



- shrugs — rolling shoulder backwards



Exercises to avoid are: bench press military press push-ups

The physiotherapist will prescribe and supervise an exercise program designed to gradually increase the range of motion, some of which may be done at home after instruction.

When rehabilitation is complete, return to activity can be effected with a gradual return to full activity. Ice packs should be applied following activity, for 20 minutes for 2-3 weeks.

PREVENTION

1. Maintain a general level of fitness — strength and flexibility
2. Practice good posture — avoid slumping
3. Avoid working overhead for long periods
4. Warm-up (including stretching) and warm-down (including stretching) before and after exercise
5. Recognise and respond to signs of injury, e.g. pain, compensation, disuse
6. Avoid repetitive action, e.g. swimmers, breathe on both sides for crawl.

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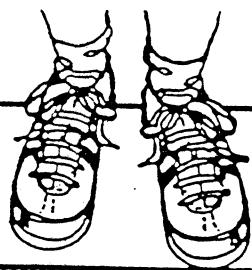
Prepared by Chris Wildgen, National Sports Trainers Coordinator, Australian Sports Medicine Federation.



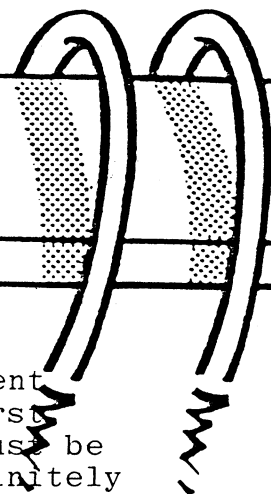
AXIOMS RELATING TO THE DURATION AND EXTENT OF A TAPER

By George E. Bole

1. The longer the training build-up has lasted, the longer the tapering period be made.
2. The greater the amount of training has been, the larger the taper should last.
3. The younger the swimmer is, the shorter the tapering phase should be.
4. The shorter the race distances are, the longer the taper should be.
5. The more events to be swum or the more competition days with races are in the offing, the greater will be the amount of training during the taper.
6. The longer the competitive distances are, the more meters have to be swum during the taper.
7. It is a rule that there are three days of recovery between any intensive stress, especially during the last intensive race specific loads and the time of the first race of the competition. This means that during the period, there should only be rather relaxed swimming and a few sprints up to 25 meters—Neuro-Hormonal regulation needs a longer recovery time than energy.



FAVOURITE WORKOUTS



Here are two of my favourite personal workouts for different phases of the season (endurance and competitive). The first one is safe and straightforward, however the second one must be published with the cautionary notes attached as it is definitely a 'fit person's' workout.

1. Endurance Phase - 1 hr. workout.

ADVANCE	MID.	NOVICE
Warm up: 8 x 100 F/S Drill on 1:45 Swim on 1:30 (alternate)	6 X 100 F/S Alternate Drill & Swim 15° R.I.	4 X 100 F/S Alternate Drill & Swim 20° R.I.
* 5 X 400 F/S Simulators on 8:00 200 15° 100 10° 50 5° 50	3 X 400 SIMS. 2 Min. R.I. 200 20° 100 15° 50 10° 50	2 X 400 BROKEN 2Min. R.I. Broken into any acceptable unit with rest interval to suit the swimmer. (E.g. 16 x 25 10° R.I.) 8 x 50 20° R.I. etc.)
16 X 50 FLY on 60° (+ fins optional) Swim 25 Kick on back 25	10 X 50 FLY 20° R.I. Swim 25 Kick on back 25	8 X 25 FLY 30° R.I. Swim Kick on back
Cooldown 200	Cooldown	Cooldown

* I sometimes give myself an interval to leave on rather than a rest interval. Sometimes I make the intervals descent over the entire set. (Each 400 still on 8:00).

E.G.	1	2	3	4
200	2.45	2.40	2.35	2.30
100	1.30	1.25	1.20	1.15
50	50	45	40	35
50	50	45	40	35
<u>Total Time:</u>	<u>5.55</u>	<u>5.35</u>	<u>5.15</u>	<u>4.55</u>

(I have to put flippers on to make the times in No.4!!). Any combination of interval times can be drawn up to make the set work, however you want it to work.

2. Competition Phase - 1 hr. workout.

* N.B. CAUTION: The main set (4 X 50 10° R.I.) maximum effort should only be worked as an anaerobic or lactic tolerance set by those swimmers that are very fit, very experienced and younger. Swimmers that fall outside of that category can still do the workout, BUT the MAIN SET MUST change emphasis from a maximum effort set to a 200m. pace practice set, possibly with a longer rest interval between each 50.

The difference would be that when the set is worked as a maximum effort set the total time (minus 30° rest) would be faster than P.B. 200. Worked as a 200 pace set the total time would be the same or slower than the P.B. 200.

IMPORTANT TO MONITOR HEART RATES!!

	ADVANCED	INTERMEDIATE	NOVICE
W.U.	400 easy F/S	300 easy F/S	200 easy F/S
	400 Main Drill & swim mix.	300 Main Drill & Swim mix.	200 Main Drill & Swim mix.
	4 X 100 Main Kick 10° R.I.	3 X 100 Main Kick 15° R.I. 70° Effort	6 X 50 Main Kick 20° R.I.
	70% effort last SPRINT	Sprint last 25 each	
	Last 25 in each 100	100	
	8 X 50 Main Pull On 45° 50° or 60° (depending on stroke)	6 X 50 Main Pull 15° R.I. (See advanced)	8 X 25 Main Pull 15° R.I.
	E.g. B.R. Pullflips		
	F.S. pullbouv	* MAIN SET	* MAIN SET
	B.K. scooter	(4 X 50 10° R.I.)	200 pace. What is
	FLY-B.R.pullflips	X 2 on	200 P.B.?
		10 Min.	Divide by 4 & add
	*MAIN SET	Recovery swim in	20. Swim 4 X 50
	(4 X 50 10° R.I.)	between	with as much rest
	X 3 on 10 min.	COOLDOWN as reqd.	in between so that
	with recovery swim.		you can just make
	COOLDOWN as reqd.		nominated 50m.times.
			COOLDOWN as reqd.

EDITORS NOTE: THANKS TO LYNDIA LEHMANN FOR SUBMITTING
HER FAVOURITE WORKOUTS

DEADLINE FOR NOVEMBER ISSUE : NOVEMBER 1st.

NOTES ON COLDWATER AND SWIMMING

FOR AUSSI MASTERS SWIMMERS

- : Normal body temperature is 37 degC
- : Heat is transferred from a higher temperature to a lower one
- : Water provides an ideal medium for the transference of heat
- : If water temperature is less than 37 degC then heat will be lost from the body to the water
- : The rate at which heat is lost depends on:
 - (1) surface area of the body (longer thinner people have greater surface area to Kg of body weight)
 - (2) the amount of body fat - the more body fat the greater insulation
 - (3) the temperature of the water
 - (4) the air temperature
 - (5) the amount of wind and chill factor
 - (6) the age of the swimmer - older age group have lesser ability to cope with cold
 - (7) the degree of fitness of swimmer - the less fitness, the less change of adaptation
 - (8) the rate of swimming and the heat produced. Slower swimmers produce less heat
 - (9) Individuals metabolic rate - higher MR will produce more heat
 - (10) the amount of external insulation - e.g. cap, grease, wetsuit
 - (11) the length of time the person is in the water. Hypothermia is a condition when the core body temperature reaches 35 degC or less. The lower the core temperature the greater the damage and certainty of death. Even 2degC either side will be noticed and more than this will start to cause discomfort. Below 20 degC is certainly not advised.

LONG DISTANCE SWIMMING

For long distance swim events, the temperature of the water and the estimated length of time to be spent in the water are important factors in determining whether hypothermia is a risk. All the 11 factors mentioned need to also be considered. It is a complex factor.

WEDDING BELLS

.... JOHN BONNING UPDATE...

John (ex Townsville & Miami Masters) is getting married - yes, married!! To a lovely lady named Judy Meyer, who was the coach of the Lumberjax at the World Titles. The date is October 19th 1989. If you want to contact him(them) the address is 11548 Orange Blossom Lane, Boca Ration, Florida 33428 U.S.A. Phone number 0101 - 407 - 479 2679

...They'd love to hear from you.

There is no easy answer to calculate the risk. Every individual is different and to estimate an individual risk factor, particular note must be made of:

Body fat
Age
Coldness of water
Speed of swimming

The problem of hypothermia is complicated by onset of shivering if this occurs early in the event then you will get hypoglycemia (low blood sugar) which will reduce endurance or survival time.

energy reserves will be reduced



further hypothermia

SUGGESTIONS:

For distance swimming - 18 degC and below wetsuits allowed - prudent
20 degC below - even more prudent for Masters swimmers

FINA rules for long distance swims have the lower temperature as 16 degC, however the predicted survival time 2 hours then becomes marginal. (Royal Life Saving Society Guidelines)

AUSSI needs flexibility to make our OWN RULES for our own members.

TRAINING IN COLD WATER

Ideal training temperature is 27 degC. Humans are very sensitive to change in temperature even 2 degC higher or lower will be noticed. Therefore a range of comfortable water temperature is 25 - 29 degC.

Of course how long a person stays comfortable depends on the many factors discussed under long distance swimming, e.g. how hard and long one trains. Temperatures outside this range e.g. below 24 degC and above 30 degC will place an added stress on the body.

COLDWATER SWIMMING AND THE HEART

With cold water the blood vessels constrict, causing an increase in blood pressure. This increase in blood pressure causes extra work for the heart, hence it needs more oxygen. If one is exercising, i.e. swimming at the same time this will again increase the work on the heart. However, blood vessels carrying blood to the heart may also constrict and fail to supply adequate oxygen to the heart muscle itself causing angina. Also with arm work like swimming the muscles exert pressure on the blood vessels returning to the heart and again restrict blood flow and add to the angina.

Also, if there is a weakness in the blood vessels of the heart and the pressure is increased, it has the chance of causing an infarction or heart attack.

The temperature of water that will bring on such an effect will not be standard for all people. However certainly anyone prone to angina or having had a cardiac history should be wary in water 20-24 degC and should not swim in water below 20 degC.

For those without a known history, they should be cautious in water 20-24 degC, and it is not recommended that any competition take place in water below 20 degC without the use of wet suits.

It is the responsibility of any group organizing swim meets to provide suitable water at an ideal temperature and provide adequate shelter from the elements.

SUMMARY FOR WATER TEMPERATURES:

IDEAL : 25 - 29 DEGC

CAUTION NEEDED: 20 - 25 DEGC 29 - 32DEGC

NOT RECOMMENDED: BELOW 20DEGC (Wetsuits 20-18 and below)
ABOVE 32DEGC

KAY COX

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MASTERS SWIMMING IN AUSTRALIA (INC.)

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COACHES LIABILITY INSURANCE

For any person who either teaches or coaches swimming, there is a possibility that he or she may at some time be sued by the person they are teaching, if that person is injured. If the person dies, the claimant could be a next of kin.

Unfortunately, neither your swimming club's Public Liability Policy, nor your own Personal Liability Insurance covers this risk. **EVEN WORSE**, you may be sued for your own personal fortune, i.e. your home, car, furniture etc.

- Claims of this nature are becoming more frequent and therefore in order to provide protection for our coaches and teachers, AUSI Masters Swimming has arranged through Insurance Exchange of Aust. a group policy which you can join for a premium of \$20.00 inclusive of Stamp Duty and Policy Fee. The policy will protect you for a limit of \$2 million for each and every claim made against you. There is a policy excess for each and every claim of \$500.00

Consider what you would do if you were presented with a solicitor's letter holding you responsible for a serious accident to one of your members which has resulted in that person becoming a quadriplegic. Now you need worry no longer, as the policy extends to cover your legal costs in defending an action brought against you, as well as for the cost of the final settlement.

The policy cover commenced on 1st January 1989 and we would ask you to send a cheque for \$20.00 **made payable to : Insurance Exchange of Australia** and the attached form to **AUSI MASTERS SWIMMING**
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PLEASE NOTE: PERSONS CURRENTLY HOLDING LEVEL 1 OR LEVEL 1 M COACHES ACCREDITATION MAY APPLY DIRECT. NON ACCREDITED CLUB COACHES OR ASSISTANCE COACHES MUST APPLY THROUGH THEIR CLUB, AND THE CLUB MUST PROVIDE A STATEMENT THAT THE PERSON IS ACTIVE IN CLUB COACHING.

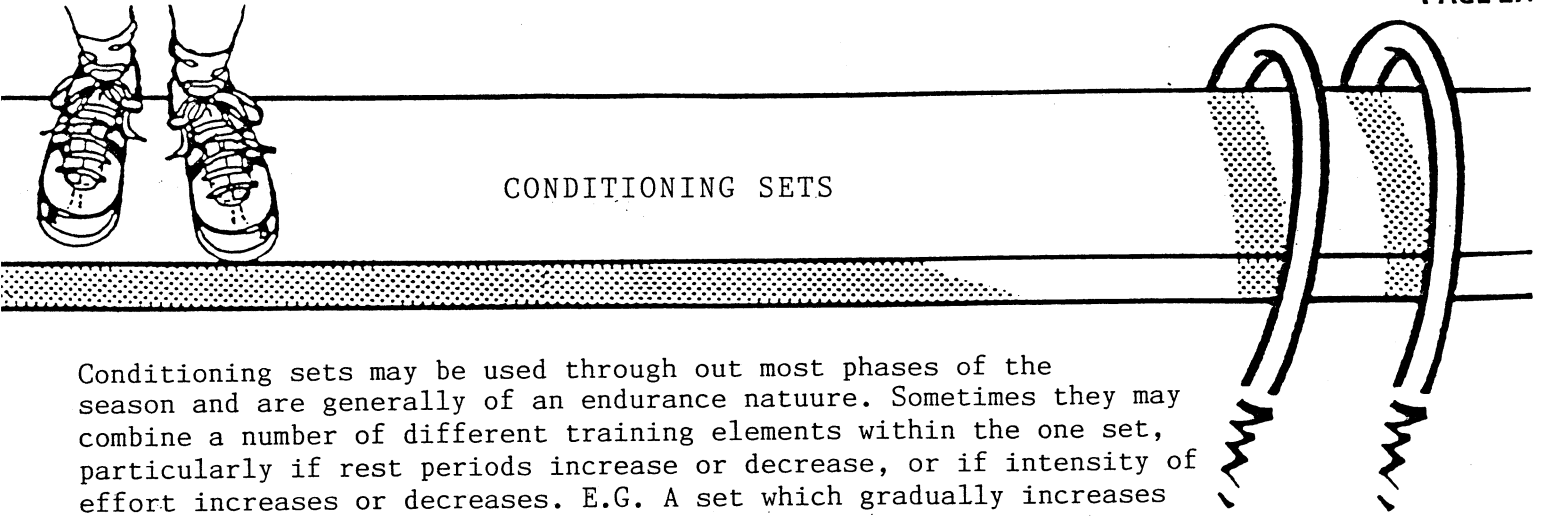
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CONDITIONING SETS

Conditioning sets may be used through out most phases of the season and are generally of an endurance nature. Sometimes they may combine a number of different training elements within the one set, particularly if rest periods increase or decrease, or if intensity of effort increases or decreases. E.G. A set which gradually increases in both rest and intensity may start out as an endurance set but may become a lactate tolerance set before finishing as a speed set (assuming distances decrease as well.)

.SIMULATORS Progressively halve distances and rest. Intensity increases as set progresses. OR Halve distances and double rest increasing intensity as set progresses.

E.G.	A	B
800m	-2min.	-10 secs.
400m	-1min.	-15 secs.
200m	-30secs.	-30 secs.
100m	-15secs.	-1 min.
50m	-10secs.	-2 min.
25m		

.PYRAMIDS A-Hold same pace throughout or B-increase speed over shorter distances.

E.G.	A	B
50m	-10 secs.	400m -10 secs.
100m	-20 secs.	200m -20 secs.
200m	-40 secs.	100m -40 secs.
400m	-60 secs.	50m -60 secs.
200m	-40 secs.	100m -40 secs.
100m	-20 secs.	200m -20 secs.
50m	-	400m -

.LOCAMOTIVES A non-stop swim varying pace and distance and perhaps stroke.

E.G. 50m easy -50m fast
75m easy -75m fast
100m easy -100m fast
etc.

They may be done as a simulator, or as a pyramid.

.FAERTLEK Long distance covered at a comfortable speed with intermittent speed bursts e.g. - at random
-for a set time e.g. 3min easy 1min hard.
-for a set number of laps e.g. 4 laps easy, 2 laps hard.
-changing strokes and speed.

.PERMUTATIONS A set distance is broken into regular or irregular distances e.g.

-400m -(100m 100m 100m 100m 10secs. rest.)
-400m -(200m 100m 50m 50m 10 secs.rest.)
-400m -(50m 100m 150m 100m -10 secs. rest.)

.Play games with numbers to create new sets. E.G.

1x100m	OR	1x400m
2x200m		2x200m
3x300m		4x100m
etc.		8x50m
		etc.

.Descending time intervals e.g.

4x100m on 2min.	OR	1x100m on 2min
3x100m on 1.55		2x100m on 1.55
2x100m on 1.50		3x100m on 1.50
1x100m on 1.45		4x100m on 1.45

.Alter percentages of fast:easy e.g. x100m's may be done as
easy-fast easy-fast easy-fast

1 - 1	or	4 - 1	or	4 - 4
1 - 2		3 - 2		3 - 3
1 - 3		2 - 3		2 - 2
1 - 4		1 - 4		1 - 1

.Use off distances e.g.

75m's, 125m's, 150m's. etc.

.Count down 50's. This is a very challenging set that most swimmers seem to enjoy. The starting time depends on how hard or easy you wish to make the set. Decrease the send off time by 1sec. or 2secs. per 50m. Swimmers go till they physically miss the time interval. The coach could use 2 stop watches to help with send offs.

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