



The Royal Military College - Duntroon
Army Officer Selection Board
Bridging Period Conditioning Program - Guide





Introduction

A pint of sweat will save a gallon of blood.¹

To be an effective leader in the Hardened and Networked Army and display the qualities of an Australian Soldier in the 21ST Century, Army officers need to be physically tough and mentally resilient.

To lead from the front, an officer must be able to carry out daily operational tasks with enough energy in reserve to withstand the unexpected. The officer must be able to remain mentally alert and physically capable whilst suffering from battle fatigue.

It therefore stands to reason that physical conditioning, sport and an active lifestyle underpin the cadet training environment at the Royal Military College of Duntroon (RMC-D).

The bridging period between your AOSB and the commencement of training at RMC-D provides you with the opportunity to improve your physical fitness and incorporate an active lifestyle into your daily routine. Both of these attributes will greatly enhance your integration into the RMC-D.

A handwritten signature in black ink, appearing to read "M. J. Moon".

M. J. MOON, DSC, AM
Brigadier
Commandant
Royal Military College of Australia

08 May 2009

¹ George S. Patton, Jr.: Message to troops before landing at Casablanca, 08 November 1942

THE RMC – D
ARMY OFFICER SELECTION BOARD
BRIDGING PERIOD CONDITIONING PROGRAM
GUIDE

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ACRONYMS AND ABBREVIATIONS

| | |
|----------|---|
| ACS PESA | All Corps Soldier Physical Employment Standards |
| AOSB | Army Officer Selection Board |
| BPCP | Bridging Period Conditioning Program |
| BFA | Basic Fitness Assessment |
| BPM | Beats Per Minute |
| FITTOR | Frequency Intensity Time Type Overload |
| PSRT | Recovery Progressive Shuttle Run Test |
| PT | Physical Training |
| PTI | Physical Training Instructor |
| RMC | Royal Military College |
| RPE | Rate of Percieved Exertion |
| ROM | Range of Movement |

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CHAPTER 1

PHYSICAL TRAINING AT RMC-D

ARMY COMBAT FITNESS TRAINING

The aim of combat fitness training in the Army is to:

- train soldiers to be physically fit to perform their mission specific tasks in a combat environment; and
- physically condition and maintain a high standard of fitness for both regular and reserve soldiers regardless of corps, rank and gender throughout their careers.¹

PHYSICAL TRAINING AT THE ROYAL MILITARY COLLEGE OF DUNTROON

In addition to the Army aims of combat fitness training/physical training (PT), the RMC-D aim of PT is to:

- prepare cadets for the physical demands of service in the Hardened and Networked Army (HNA) and provide leadership of the Australian Soldier of the 21st Century (AS21C);
- develop cadet mental resilience, self-confidence and physical toughness;
- provide an opportunity for cadets to display the values of an Australian Army officer; and
- contribute to whole-of-person development.



The Scope of PT at RMC-D

The scope of PT at RMC-D follows the generic scope of PT in the wider Army. The basic components being:

- physical training, and
- sport.

¹ LWP – G7-7-4 Combat Fitness Handbook

Physical Training

Following the Physical Conditioning Optimisation Review (PCOR), all classes participate in PT for a minimum of three days a week whilst in barracks. These PT class are typically conducted on a Mon, Wed and Fri and are generally from 40 to 80 minutes in duration.

During III Class, Initial Cadet Training (ICT), PT is often conducted more than tree times a week in order to teach correct exercise and movement techniques and develop an effective physical conditioning platform for future activities.

All PT at RMC-D is conducted by Physical Training Instructors (PTI), specifically trained serving members of the Australian Army. The PTIs conduct formal PT sessions which can range from running and circuits to battle PT and Military Self Defence.

PT assessments at RMC-D. In order to ensure that you develop and maintain the level of physical conditioning required during various stages of your training the PTIs conduct several different PT assessments. These include:

- **The Initial Fitness Assessment (IFA):** Shuttle run, Push ups, Sit ups.
- **The Swim Assessment:** 50m swim any stroke; 2 minute tread water.
- **The Basic Fitness Assessment (BFA):** Push ups, Sit ups, 2.4km Run
- **The Sports Physical Readiness Standard (SPRS):** The BFA as above; Chins ups (male/female); Flexed arm hang (Alternative for females)
- **The Combat Physical Readiness Standard (CPRS):** The Urban rush
- **The All Corps Soldier Physical Employment Standard (ACS PESA):** Weight loaded march (WLM), Fire and movement (FM), Lift and carry (LC) and the Box lift (BL).WLM: Fighting Order (FO) from 20-23 kgs in 50-55 mins; FM: 12 x 6 m bounds in FO to a cadence; LC: 5 x 25 m walk in FO to a cadence with a 22 kg water jerry in each hand; and BL: Lift a 25 kg box safely to shoulder height.

The SPRS and CPRS have points awarded based on ability. While all points contribute to coy scores for the champion coy, individuals who achieve a high enough standard are awarded a 'gold' badge for their achievements.

Sport

Sport at RMC-D is conducted in two formats:

- team sports, and
- CSC sporting events.



Team sports at RMC-D. The team sports at RMC are competed at an Inter Coy level with coys competing against each other in a variety of sports, which include

- Soccer,
- Netball,
- Basketball,
- Rugby Union,
- Australian Rules football, and
- Touch football

Following a period of sports specific conditioning, the sports are contested in a round-robin competition with three sports contested per semester. As part of the 'whole-of-person' development, all II Class cadets complete a sports coaching course and once qualified, progress to act as assistant coaches for the qualified I Class coaches. Whilst the majority of the coaching is conducted by qualified I Class cadets, overall supervision is still maintained by delegated Sports Officers from the RMC-D staff and the Warrant Officer PTI.

On occasion team sports may be contested against other military units and/or civilian teams.

CSC sporting events. To further foster 'will-to-win' and 'esprit de corps', a variety of inter company sporting events, organised by the PTI staff, are conducted at RMC-D. Some of these events are conducted annually whilst others are conducted every semester. These events include:

| | |
|------------------------------|-----------------|
| Obstacle course competitions | (annually); |
| Cross country | (annually); |
| Tug-o-war | (annually); |
| Swimming carnival | (as scheduled). |

THE TRANSITIONAL PERIOD PHYSICAL CONDITIONING PROGRAM

A preliminary review of the changes to physical conditioning standards of successful Army Officer Selection Board (AOSB) candidates over the transitional period from AOSB to commencement of training at RMC-D was completed in early 2008. This review found that a large number of the tested group lost strength-endurance or progressed at a pace well below that expected over the transitional period. Likewise, while many candidates did gain metabolic (aerobic) fitness, the amount of gain was below that expected over the period.

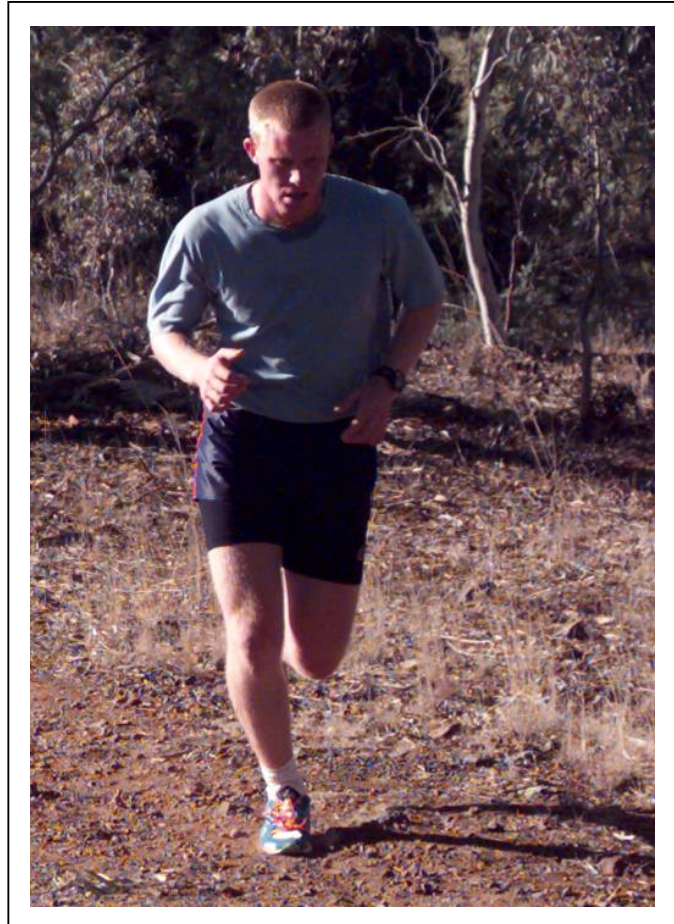
With this in mind, a theoretically sound, peer reviewed, physical conditioning program has been developed to assist successful AOSB candidates physically prepare themselves for training at RMC-D.

The six week physical conditioning program² is divided into two cycles with each cycle focusing on a different conditioning component. Lasting for three weeks per cycle, the program has been designed to allow a continuous recycling whereby the first three-week cycle (Weeks 1-3) can follow the second three-week cycle (Weeks 4-6) as Weeks 7-9.

² The program and exercise technique guides can be found in rear section of this book – 'The RMC-D AOSB Transitional Period Conditioning Program.'

THE PHYSICAL ACTIVITY LIFESTYLE AT THE ROYAL MILITARY COLLEGE OF DUNTROON

In addition to dedicated PT and sport, the general lifestyle of RMC-D cadets is physically active. It is therefore important that the body is likewise prepared for the very low intensity, but continuous, daily lifestyle activities at RMC-D. Good sleep patterns, avoiding napping during the day and being physically active during the day (eg walking rather than driving, climbing stairs rather than using escalators etc) prior to commencing training at RMC-D will aid in preventing the use of excessive energy to maintain daily function. This will leave more energy in reserve for PT and sport.



CHAPTER 2

A. WHAT TO WEAR

IN GENERAL

Be seen

Regardless of weather or terrain, your clothing should allow you to be clearly visible for basic safety. Light coloured clothing is effective (most running shoes are lightly coloured), but for night activities, particularly those on a road (running, cycling, etc.), reflective clothing is advised.

Water bottles

Your water bottle is *your* water bottle. Sharing is the easiest way to catch a viral infection. If you place anything other than water in your bottle, ensure you clean it thoroughly immediately after use as sugars in particular provide a breeding ground for bacteria.

Sun screen

There are numerous brands on the market, even some with moisturisers. Be aware that when exercising the body sweats, so the sun screen must be applied regularly as it 'washes' off. The same applies when in water. The friction caused by the water 'rubs' off the sun screen so remember to reapply. Do not let the clouds fool you, you can still get burnt.

Headdress

In sun smart tradition, headdress should be worn when outside as it provides shade for the eyes and face. Headdress also allows sweat to be trapped within it. This in turn increases the ability of the body to cool itself. The headdress should not be heavy as this may place strain across the neck. Nor should they be excessively tight. The headdress should either be of a light weave or have holes to provide for heat loss. People with longer hair may find that a cap can hold their hair in place and, if they sweat excessively the rim of the hat may provide service as a sweatband.

GENDER SPECIFIC

Females

For any exercise that involves a continuous bouncing action, such as running or aerobics, females are advised to wear a firm supporting crop top or sports bra in order to prevent breast tissue damage (regardless of size).

SHOES

The function of a shoe is to reduce impact injury to the foot by providing correct impact cushioning and support where needed.

Each sport/training style requires different motions and produces different forces. This means that the same shoes cannot be used for every sport. For example, sports like netball and indoor soccer require sharp multi-directional movements with sudden stops. The shoe best suited for this type of training requires good lateral (side) stability and a good midsole for force dispersion, as impact is across the fore foot as well as the heel. The base of the shoe needs to be flat to provide a stable platform.

Running shoes require more heel protection due to the 'heel first' impact of a running 'gait' and thus have a higher heel. This slightly elevated position allows for more cushioning but loses some of the lateral (side) stability. As running is a linear action stability is lost in favour of impact support.

To minimise injury, shoes specific to the nature of the activity should be worn. This may require additional purchase of shoes.

Lasts

A 'last' is the base of a shoe. It indicates the use and type of foot that the shoe is best suited to. There are three basic types:

- **Straight lasts.** These provide stability and are best suited for heavy people and over-pronators, (land on the outside of their foot and roll in).
- **Curved lasts.** Generally suited for longer distance and competition runners.
- **Semi-curved lasts.** These are the most standard type and are generally used for any movement.

The method in which the last is attached to the shoe is also important. There are three basic attachment methods, these being:

- **Slip last.** The upper last is fully stitched to the base of the shoe to provide maximum flexibility. This would be used for running.
- **Board last.** The upper last is attached with a board. Providing good support and is most commonly used in indoor sports.
- **Combination last.** The upper last has a fully stitched forefoot with the board connecting the last lower down. Thereby providing forefoot flexibility with good rear foot stability. These are for cross training.

Buying new shoes and wearing them in

During exercise your feet elongate and spread upon impact. They also swell slightly as blood flow to the extremities is increased. In fact, your feet can swell up to half a size during training. Here are a few tips to assist you in purchasing the right shoe and making them work best for you:

- Replace your shoes frequently. For running, use 600-800km as a rough guide (if you are running 20km a week you should look at changing shoes every 30-35 weeks) - Tread wear does not reflect the loss of shock absorption by a shoe.
- If you find a model that suits you and does not cause injury, stick with them.
- If store policy permits go for a walk/run in the shoes. If it doesn't, go to a different store.
- Always try both shoes on as your feet will not be exactly the same.
- Break your new shoes in slowly by alternating them with old pairs.
- Sizing between companies is usually slightly different so always try the size above and below your normal size when purchasing a new/different brand.
- Your feet are larger at the end of the day due to the day's activities such as walking, standing etc. This can give you an indication as to how much your feet swell during exercise and is a better time to try on new shoes.
- Make sure there is about a finger's width from the front of the shoe to your longest (not necessarily your biggest) toe.
- The heel should fit snugly and not move up or down.



DRESS FOR SPECIFIC ACTIVITIES

METABOLIC (RUNNING) TRAINING

Shirts and singlets

Comfort is vital in a running shirt or singlet. It should not be too tight or constrictive as this may cause the shirt/singlet to ride high under the arms, cutting and chaffing the skin. It may also cause painful nipple chaffing. A shirt, which is too loose, may bounce around irritably as you run.

Triathlon singlets

Triathletes need a top that they can wear through all three disciplines: T-shirts drag in the swim leg and with this in mind tight fitting shirts are preferable. These shirts are more elastic and have a lower under arm cut to prevent riding up. They are also more expensive than your average T-shirt.

A long sleeve shirt

A long sleeve shirt is always preferable to a short sleeve shirt as it provides protection from the sun; it must, however, be of a light material, breathable and able to hold sweat in order to allow effective cooling (cotton and Coolmax materials are of better quality). If you prefer to train in a singlet or short sleeve shirt, remember the sun screen.

Shorts

Specific lightweight shorts are recommended under dress shorts or those favourite football shorts in order to avoid chaffing cuts.

Socks

Some people prefer to run without socks, be aware that the occurrence of blistering increases, as there is nothing between the foot and the shoe to absorb the sweat and reduce friction. Running with two pairs of socks also increases the chance of blisters as the inner and outer sock rub together and produces local heat and friction.

NEUROMUSCULAR (WEIGHTS) AND CIRCUIT TRAINING

Shirts

The shirt should allow full range of movement and not 'grip' the body as it moves. For this reason wear baggy shirts or singlets are often selected as they allow the major joints of the upper body (shoulder and elbow) to move freely.

Shorts

Be aware of what shorts you are wearing. Many unsuspecting members expose themselves when lying on a bench or mat. Wearing bike pants under other shorts tend to avoid the above problem and, when leg training, there is less 'grip' as you move through the range of movement. Alternatively, shorts with an inner lining may be appropriate.

Towels

Most gymnasiums require a towel when training on equipment. Not only do towels prevent open pores from infection when on a bench or mat, but avoid leaving sweat on the benches for someone else. The towel should be clean and washed after every session.

SUMMARY

Wear clothing and equipment that is safe and comfortable.

Check that you are wearing the appropriate clothing and equipment

Never compromise safety for dress sense.

B. GUIDELINES FOR TRAINING IN DIFFERENT ENVIRONMENTS

Introduction

The following section has been written to provide guidance to limit preventable injuries created by training in environments that may be unfamiliar.

GUIDELINES FOR TRAINING IN WEIGHT TRAINING ROOMS

Towels

In view of basic hygiene a towel must be used on all upholstery and training mats. On the cardio training equipment the towel should be placed on the bicycle and rower seats, and placed across the lower panel of a stepper. It is courteous to wipe down the instrument panel and any other area on which you have splashed sweat once you have finished using the equipment.

Equipment

As a matter of safety it is imperative that you receive instruction on any training equipment you are about to use. Even if you have performed the exercises before, every brand and model of equipment varies slightly, sometimes even dramatically. Instruction should be sought from Combat Fitness Leaders/Physical Training Instructors when training in the military environment or qualified and registered gym instructors in the civilian environment.

GUIDELINES FOR TRAINING IN CARDIO THEATRES

Many gymnasiums have cardio theatres, rooms or areas with a variety of electronic equipment such as running machines, steppers and cycles. In a complete cardio theatre all these electronic machines are connected to a bank of televisions. Each machine has a little box into which you plug standard walkman headphones. You then select the television station or audio station you wish to listen to and key in the channel on the black box.

You may find that during prime time (0630–0900h, 1100–1300h and 1600–2000h) most machines have a time limit of around 15-20 minutes. If there is a time limit it should be displayed somewhere prominent. Some gymnasiums may in fact require you to book if you wish to use the equipment during these times: these bookings are made either at the front desk or on a board near the machines.

It is courteous to wipe down the instrument panel and any other area you have splashed sweat once you have finished using the equipment.

Most of the different brands of electronic equipment have 'user instructions' listed on the control panel or prompt you with either flashing selection lights or prompting messages. Remember five minutes of staff instruction can prevent frustration, machine damage and most importantly personal injury (See the exercise techniques section in the AOSB Bridging Period Conditioning Program).

GUIDELINES FOR RUNNING (OR CYCLING) ON BIKE PATHS

Always stay as close to the left side of the lane as possible. If travelling two-abreast, remain on the left side of the path. Watch for people especially children or dog walkers. Children tend to be spontaneous and unpredictable whilst dogs on leads can cause accidents for those not paying attention.

Remember to stay alert at road crossings. People tend to relax on the path and when crossing a road forget that they no longer have right of way.

Be wary when running around corners and when entering tunnels: this is where most bicycle accidents (even head-on collisions) happen.

If you hear someone ring a bicycle bell or calling 'stay left' or 'coming through', do not look around, as this may cause you to veer to one side, just maintain your line of travel or move further to the left if it is safe.

CHAPTER 3

MANAGING YOUR FITNESS

MOTIVATION

Even though you may understand that fitness comes from a combination of training sessions and not the occasional one off, there will be days when you know you should be conducting some form of physical training but find motivation in short supply.

You miss a session, then another and soon form a habit.... A habit of not training. It is easy to justify missing a training session, but it is a lot more difficult to justify failing a fitness assessment to recruiting/military staff. With this in mind, motivation can be a powerful tool to keep training when the desire may not be there.

In the previous section goal setting was discussed, by providing 'seeable' gains this provides a form of motivation, several others methods of providing and maintaining your motivation to train are provided below.



- **Train with a friend or training partner.** Partners provide that little extra push when needed, if not by banging on your door to get you up for that morning run, then by making you feel guilty knowing that you promised to meet them after dinner at the gymnasium.
- **Stick to the training program and avoid over-commitment.** This is more commonly seen following a 'resolution' where an individual over commits and begins training to aggressively/intensely. As it is difficult to maintain a high training intensity, after a few weeks you will find yourself starting to take short cuts by missing an exercise here and there. Furthermore, the more fatigued you become, the harder it is to remain motivated. So in short stick to the program and avoid adding in more training.
- **Keep a log.** The positive results of training take time and, as gains are gradual, are hard to notice. By keeping a logbook you can compare entries. For your push ups you could do 10 repetitions last month, now you can do 15; you had dessert every night when you first started training, now, a month later, you only have dessert once a week.
- **Stay Flexible.** If you miss a session due to work shifts, illness etc, do not let it cause frustration. Skip the session rather than trying to squeeze it in with another training day and continue on.

Summary

There are many other ways to stay motivated but motivation is individual, what motivates one may not motivate another. So identify what motivates you best whether it be watching a sporting video before hand or listening to music during your workout.

ACTIVATE FOR AN ACTIVE LIFESTYLE

Introduction

Almost all of our body's systems have a role in providing movement, thereby providing the ability to do physical work. Yet over the decades, the need for physical work in every day life has declined through science, technology and laziness. With this in mind, an easy and effective way to supplement your physical training program is to increase physical activity through everyday activities. Not only will this assist in improving your physical health and fitness but more importantly, training to be continually active during the day will ensure a smoother transition into the active lifestyle of RMC cadets undergoing military training.

- **Throw away the remote control.** If you have a television in your room or a common room, throw away the remote control. This will mean that for every time you change a setting on the television you will need to stand up and sit down, thereby performing one squat. Assume you use the remote control five times a night (TV on/off, channel hopping, sound up/down) that would mean you perform 35 squats a week and 1820 squats a year.
- **Get outside.** Rather than sit in your room and watching endless videos or playing video games, go outside. Go for a walk or go kick a football in the park.
- **Be functional.** Forget escalators when you come across them, take the stairs, if you do take the escalator at least walk up them.
- **Transport.** When you drive somewhere, park in the farthest car parking space. If you take public transport, get on at the station before or after your current one or get off a station or two early and walk the rest of the way. Make a rule that if anything is less than one and a half kilometres away (local shops etc) then you will walk.



Summary

It is the combined effect of these little things (lifestyle changes) that will have a lasting impact on your fitness levels, both now and throughout the remainder of your military life.

CHAPTER 4

PHYSICAL CONDITIONING FORMATS AND CONCEPTS

THE PHYSICAL CONDITIONING SESSION 'BLUEPRINT'

All of the programmed PT in the military is conducted in a formal setting and, as such, each session follows a standard military blueprint. This blueprint divides the session into five distinct phases. These phases are:

- the preparation phase,
- the warm up,
- the main body,
- the cool down, and
- the conclusion.

Whilst this is the format for military PT it is also the format you should follow when conducting your own training and following the provided Bridging Period Conditioning Program (BPCP).

The Preparation Phase

The preparation phase encompasses the administrative procedures conducted prior to the actual physical component of the session. This can include unit parades, roll calls, signing in the gymnasium register, packing your pack for the weight loaded walks etc.

The Warm Up

Prior to all formal PT and likewise recommended for all personal training, a warm up is to be conducted. The aim of the warm up is to prepare the body both physiologically and psychologically for the main body activities to follow.

The purpose of the warm up is to:

- progressively increase the flow of oxygen and nutrient rich blood around the body to the working muscles and to redirect this blood away from non-essential areas eg. intestines.
- increase range of movement in muscles and limbs through stretching in order to prevent injury; and
- increase secretion of synovial fluid into the joint capsules.

The warm up is sub divided into several phases, these are:

- **The general phase.** This phase is used to warm up the entire body by conducting activities that incorporate gross compound/complex exercises. This phase lasts for around five minutes and should include activities that consist of continuous full range movement eg. walk/jog with movements like biceps curls or military press, thereby using the body as a whole.
- **The ROM phase.** The ROM phase aims to prepare the body to complete movement patterns through specific degrees of movement. This phase uses a combination of exercises performed to a ROM that will be required for the main body of the lesson and often incorporates ROM stretching exercises. ROM stretching exercises are similar to traditional stretching exercises but are only held for **3–5 seconds**.
- **The specific phase.** As the name suggests the specific phase prepares the body for the specific actions that will be performed during the main body of the lesson. This is often done by mimicking the actions that will be performed during the main body at a lower intensity eg. light weight repetitions of the circuit you are to commence or passing a ball around before a football match.

The climatic conditions and other daily factors dictate the duration of the warm up. However, a general indication of being adequately warmed up is the presence of mild sweating^{1 2 3 4} or a heart rate of around 140 BPM.⁵ In terms of duration, the warm up should last between 10 and 15 minutes.

The Main Body

It is in this phase of the blueprint where the true PT begins. The type and duration of exercises and the nature of the overall activities performed will depend on the aim and purpose of the session. Your training program in 'The RMC-D Bridging Period Conditioning Program' provides guidance in regard to duration and exercises to be performed.

The BPCP provided has five key componenets:

- **Push up training sessions.** The Push up training sessions are used to not only improve upper body strength-endurance and trunk stability but more importantly to focus specifically on correct exercise technique in a manner based on individual ability.
- **Sit up training sessions.** Follows the same principals as above with the focus being on trunk movement.
- **Circuit training sessions.** The circuit sessions involve traditional circuit style activities with exercises conducted one after the other and then repeated.
- **Run training sessions.** The run training sessions are those used to develop the metabolic or energy systems of the body and involve activities like long slow distance, fartlek (Speed-play) and interval sessions. The key focus of these sessions is cardiovascular health and improved aerobic based ability.
- **Walk sessions.** Whilst, a key Army requirement is the ability of the individual to carry load (eg webbing and pack) over various distances and terrains, other activities like marching drills and moving from one lesson to another place load on the muscles and joints of the body. The aim of the walking sessions is to prepare your musculoskeletal system to continuous loads. These sessions are not designed to be overly taxing (no 'puffing' and 'panting' required) but to rather stimulate bone development and strengthening.

| | Cycle 1 (Weeks 1 – 3) | Cycle 2 (Weeks 4 – 6) |
|----------------|--|-----------------------|
| Mon | Push up trg Circuit trg Sit up trg | Run trg (Time Trials) |
| Tue | Run trg (Long Slow Distance) | Circuit trg |
| Wed | Push up trg Circuit trg Sit up trg | Run trg (Fartlek) |
| Thu | Run trg (Long Slow Distance) | Circuit trg |
| Fri | Push up trg Circuit trg Sit up trg | Run trg (Intervals) |
| Sat/Sun | Walk trg | |

Table 4-1: An overview of the AOSB Bridging Period Conditioning Program main body activities.

¹ G.Egger, N. Champion, & A. Boulton, *Fitness Leaders Handbook 4th Edition*. Kenhurst, Syd: Kangaroo Press,p.43, 1998

² A. Faccioni, 'Warming up routine for dynamic sports' in *Strength and Conditioning Coach*, 3 (1),p.7,1995

³ H.A. de Vries & T.J. Housh, *Physiology of Exercise 5th Edition*. Madison, Wisconsin: Brown and Benchmark, p.531 ,1994

⁴ I.L. Pina, M.R. Revenis, D.W. Madonna, & N. Lichtenstein, Are warm -up and cool-down exercises important. *Your Patient and Fitness*.Vol 5 No 4 July August 91. Phil :USA.,p.144h,1991

⁵ deVries & Housh, *op cit*

The Cool Down

The cool down is used to return the body gradually to its daily 'resting' state and usually lasts around five minutes (depending on the type and duration of the main activity). With your heart still pumping blood rapidly around the body, muscle contractions are needed to return this blood via the veins to the heart. With this in mind, ceasing your training suddenly will cause blood to pool in the lower part of your body: You may then become light headed and faint. This is the case when someone faints on a parade ground.

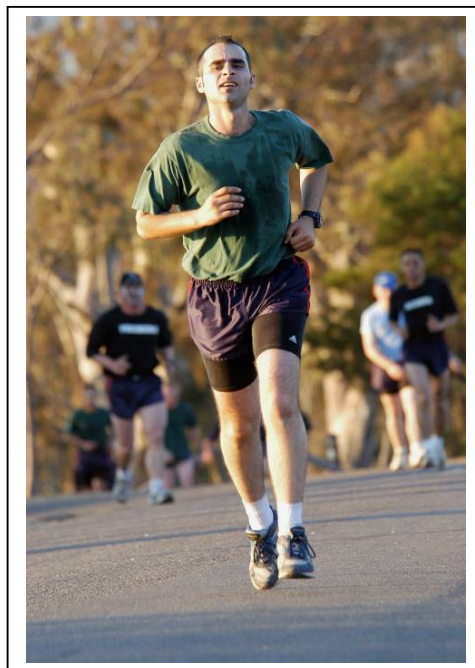
The cool down is also used to re-establish range of motion in muscles and prevent muscular imbalances. You may have seen the stereotypical body builders with hunched shoulders? This is caused by the chest and front shoulder muscles continually being trained and contracted and not efficiently stretched.

To cool down, activities of a similar nature to those performed in the main body of the session are used but at a gradually decreasing intensity incorporating active static stretching of the muscles used in the session.⁶ This phase should last at least five minutes and contain stretches for the muscle groups used during the session. Some example stretches are provided in 'The RMC Bridging Period Conditioning Program'.

An indication of being sufficiently cooled down is a heart rate below 100 bpm with a relaxed breathing rate and cessation of perspiration.

The Conclusion

For personal training, the conclusion of the session should be seen as the commencement of your recovery. Hydration and nutrition are important and should not be treated as an afterthought. More information on nutrition can be found in Chapter 6 of the 'Guide'.



⁶ This is stretching which you initiate and hold for around 15 – 30 seconds. R.M. Orr, 'Warming up, cooling down and flexibility' ADFPTS, HMAS CERBERUS, Vic, 1998

PHYSICAL CONDITIONING PROTOCOLS

This section has been included with the aim of outlining the basic protocols of physical conditioning used to develop your program. It is an understanding of these protocols that will help you develop an appreciation of why the program is structured the way it is and should be followed without unguided alterations.

THE FITTOR PRINCIPAL

FITTOR is an acronym for Frequency, Intensity, Time, Type, Overload, and Recovery and it is these principals which form the structure of your conditioning program.

- **Frequency.** Frequency relates to how often the physical training does or will occur. The program designed for you has a training frequency of five to six sessions per week. This frequency fits with the health and fitness industry guidelines.^{7,8,9,10} and the *Australian Defence Force Policy on Physical Fitness*.¹¹ The frequency of your training is shown in your BPCP.
- **Intensity.** Intensity refers to how hard the work will be. For exercises that are neuromuscular in nature (push ups, sit ups, squats etc) the number of repetitions or duration of activation details the exercise intensity recommended. For the metabolic activities the use of the Perceived Rate of Exertion scale is recommended. This scale is provided and explained in annex A. Intensity guidelines for the run and walk sessions are detailed in each 'The RMC Bridging Period Conditioning Program'.
- **Time.** Time denotes the duration or session length. The sessions in the BPCP vary from 30 minutes to 60 minutes depending on the aim of the session.
- **Type.** There are various types of training that can be performed, each with their own unique characteristics. The types of training allocated to your training program are those detailed above in the section regarding the lesson's main body.
- **Overload.** In order to provide progression and avoid overtraining, overload is introduced to make the exercise progressively more advanced, thus requiring the body to adapt and develop. Overload in the BPCP has been applied by manipulating the volume of exercises (how many and how long) with the intensity of the exercises (how hard). The percentages approach for the Push ups and Sit ups and the calculation of interval run times based on personal 2.4 km times allows for overload to be applied in a manner consistent with principle of individuality.
- **Recovery.** Recovery is the period utilised to recuperate and allows the body to adapt to the training stimulus. The BCPC has been structured to ensure adequate recovery from the training stimulus. Additional exercise must be avoided, especially in the first few weeks of training. Whilst you may feel that you are able to perform more work or work harder, the impact of cumulative sessions must be taken into account, for example muscle and bone recovery and strengthening, which only occurs when the body is at rest and recovering.

⁷ American College of Sports Medicine, 1998. Position Stand - The Recommended Quantity and Quality of Exercise for Developing and Maintaining Cardiorespiratory and Muscular Fitness, and Flexibility in Healthy Adults, *The Physician and Sportsmedicine* McGraw-Hill, Inc. Vol 30 No.6 Jun 98.

⁸ S.K. Powers & E.T. Howley, 1997. *Exercise Physiology. 3rd Edition*, Madison, Wiscon: Brown and Benchmark.

⁹ Wilmore & Costill, *Op. Cit.*

¹⁰ R.J. Shephard, 1994. *Aerobic Fitness and Health*. Champaign, IL : Human Kinetics.

¹¹ DI(A) PERS 148-1 Australian Defence Force Policy on Physical Fitness of 13 Jun 97, para 8.b.

Perceived Rate of Exertion Scale

| | |
|-----|-----------------------------|
| 0 | Nothing at all |
| 0.5 | Very, very weak |
| 1 | Very weak |
| 2 | Weak |
| 3 | Moderate |
| 4 | Somewhat strong |
| 5 | Strong |
| 6 | |
| 7 | Very strong |
| 8 | |
| 9 | |
| 10 | Very, very strong (maximal) |

Table 4A-1: The PRE scale

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CHAPTER 5

INJURY PREVENTION AND MANAGEMENT

NOTE: THIS SECTION PROVIDES GUIDENCE IN INJURY TREATMENT AND MANAGEMENT. IT IS NOT INTENDED TO REPLACE A MEDICAL PROFESSIONAL – IF IN ANY DOUBT ABOUT AN INJURY/ILLNESS CONSULT YOUR MEDICAL PRACTITIONER.

When the physical body is pushed beyond its limits, injuries to soft tissue structures may result. It is at this point that timely and effective management can limit the severity of the injury, enhance the return to activity and help prevent recurrence.

Good pain or bad pain

Before injuries and illnesses are discussed the difference between the 'bad' pain from injury/illness and the 'good' pain, felt during and after training, must be distinguished. The two are often confused, especially when battle cries of 'go for the burn' and 'push through the pain' are used.

So, what is the difference? Firstly, a sudden intense pain is bad. Stop. This is a 'bad' pain. The 'good' pain associated with physical training is in fact not actually a pain in itself but a feeling of **temporary** discomfort. During a training session for example, you could be breathing heavily; it should feel uncomfortable but NOT painful. You may feel fatigue and heaviness in the legs but this should decrease when you stop. After a physical training session, muscle soreness, or the more accurately termed Delayed Onset of Muscle Soreness (DOMS), may result. DOMS typically **occurs around** 12 – 24 hours following a session and may increase in sensitivity for up to three days following the session. DOMS is generally not of concern and will be discussed later in the chapter.

| Bad Pain | Good Pain |
|--|---|
| Sudden. | May ease with stretching. |
| Intense. | Heavy limbs after a training session (fatigue). |
| In the central back, chest or neck. | |
| Radiating through limbs. | |
| Prolonged muscle soreness (more than three days after a work out) | |
| Unusual rib tenderness. | |
| Gets worse with stretching. | |

Table 5.1 Pain comparison table

As your training experience increases you will be able to feel the differences more clearly, which in turn, leads to greater achievements and fewer injuries. **If in doubt consult trained medical staff.**

SOFT TISSUE INJURY TREATMENT

When the soft tissue structures (eg muscle) are injured the well known RICED protocol is followed for the first **48 – 72 hours**.

Stop

This is the first and most important step. Do not try and 'work through it.' Remember 'a stitch in time saves nine'. No matter how often this is repeated the majority of people do not stop immediately. By not treating the injury immediately it has the potential to become worse and therefore increase recovery time.

Now that you have stopped doing what you were doing, immediate injury management can be carried out. The majority of exercise related injuries are 'soft tissue' injuries (sprains, strains, corks, bruising, muscle tears etc.) and, if the skin is unbroken, the RICED regime should be followed.

Rest

You have already STOPPED what you were doing, but it does not end there. You need to rest the injury until complete recovery. That does not mean 'it feels a bit better now I'll just go for a short run'. It should be noted that an absence of pain does not mean that the tissue has recovered and healed.

Ice

The coldness of ice causes the blood vessels to constrict. This decreases the amount of fluid and blood flow to the injured site and into the surrounding tissue (the cause of swelling). It also assists in reducing local pain.

How. The ice should not be applied directly to the skin. It should be crushed to ensure a better mould and fewer edges and placed in a wet towel (This applies to ice bags and packs as well). The ice should be left on for 15 - 20 minutes or until the area feels numb. If an intense pain is felt it should be removed immediately. Reapply every two hours, ensuring the skin is not still red from previous application. If ice is not immediately available, cold water can be used as an interim measure.

Compression

A broad crepe bandage should be applied to help limit the swelling.

How. It should be applied directly to the injury site, not over clothing or shoes/boots and be **as tight as a firm handshake**. If you are still using ice, the bandage can be soaked in cold water allowing the cold to diffuse through the crepe bandage. A small tail of bandage can be left loose and applied over the ice pack to keep it in place. The bandage must be loosened if it becomes painful, overly uncomfortable, feeling is lost in the extremities (fingers or toes), or you feel a numbness/tingling. Remember the injured site is swelling and the bandage may tighten. If too tight the bandage will do more damage than good. **Action** - remove the entire bandage and reapply slightly looser.

Elevation

The injured site should be kept elevated above the level of the heart, allowing gravity to assist by decreasing the flow of blood and fluid to the injury.

Diagnosis

As soon as possible get the injury diagnosed by your family physician.



No HARM

With the R.I.C.E.D. regime followed for the first 48 to 72 hours, the NO HARM principal should also be applied to ensure a rapid recovery.

NO heat. Heat from liniments, spas, hot showers, hot water bottles and heat packs increase the internal bleeding and should be avoided.

NO alcohol. Alcohol increases swelling by causing the blood vessels to dilate or grow larger and allow greater blood flow to the injured area.

NO running. Running or any exercise begun too soon after the injury may not only cause a recurrence of the old injury but induce another one.

NO massage. Massaging and/or using heat rubs/creams will increase internal wound bleeding and swelling thereby delaying recovery and possibly increasing damage.

INJURY IDENTIFICATION AND ACTION PLAN

'Shin splints'

For those who have experienced shin pain, they know all too well the pain and sheer frustration they cause. Everyday walking can be agonising and lower limb activity is reduced to a minimum.

Definition

'Shin splints' or shin soreness is a term used when referring to pain in the front and/or back region of the lower leg. It is traditionally an injury to the soft tissue structures of the calf, caused by the tissue tearing or pulling away from its attachment to the leg bone, or the muscle swelling inside its compartment.

Signs and symptoms

A tightness or dull ache in mild cases, and a sharp throbbing pain in more severe cases. The pain is usually more severe in the latter part of the work-out or as intensity is increased and may last for several hours afterwards. In mild cases, a few hours or days of rest will relieve the pain, only to have it return once training has resumed.

Causes

The causes vary, some of the more common are:

- Overuse syndrome: too much too soon, too much track work, increase in stride length, etc.
- Mechanical imbalance.
- Excessive shoe wear and deterioration of the shoe's cushioning ability.
- Incorrect shoes for your body mechanics.
- Wearing heavy footwear for prolonged periods when not accustomed to it.
- Inadequate & improper warm ups.
- Improper running surface.

Treatment

Treatment should consist of the following steps:

- Consult your family physician or physiotherapist as soon as the injury presents itself.
- Do not train if pain is present.
- Do mild painless stretching.
- Specific lower leg conditioning exercises as prescribed by physiotherapy or PTIs.

Prevention

Prevention is the key. Use this checklist as a guideline to prevent the injury.

- Adequately stretch the muscles of the lower limb after training (most notably the calf).
- Running surface: avoid concrete surfaces whenever possible.
- Avoid excessive hill training.
- Check for excessive shoe wear and replace shoes promptly.
- Avoid 'overuse syndrome' (discussed further in the chapter).

Blisters

Blisters are common regardless of activity performed and are often more annoying than painful.

Definition

A blister is a fluid filled pocket formed between layers of separated skin.

Causes

Any form of friction, from loose fitting clothing and equipment to new shoes.

Treatment

The following treatment regime is recommended (remembering to consult the RAP or a medical staff immediately if concerned about infection):

If the blister is closed:

- Remove the article causing the friction.
- Do **not** break the blister.
- Clean the blister with an antiseptic solution.
- Apply a protective dressing. The area of the protective dressing that covers the blister and immediate surrounding area should be non-adhesive.

If the blister is open:

- Clean the area with a diluted antiseptic like salty water. Alcohol swabs will be painful and should not be used.
- Do not rip skin flaps off.
- Apply a protective dressing.

Prevention

To minimise the chance of blistering occurring:

- wear correctly fitting shoes, socks and equipment;
- toughen blister prone areas by gradually customising your feet to your shoes (especially if the shoes are new).
- carry an appropriate 'blister' kit in your pack/day pack on weight load walking sessions.
- Treat 'hot spots' before the skin is damaged.

Delayed Onset Muscle Soreness (DOMS)

Definition

DOMS is the muscular pain felt **between** 12 to 72 hours after a work-out.

Signs and symptoms

Depending on the severity, the muscle may be sensitive to touch and feel stiff and painful when going through its range of motion.

Causes

As yet the exact causes are unknown. It has however been associated with activities that require high amounts of negative muscle work like: continual jumping down from objects, running down hill and sharp increases in the amount or intensity of weight training.

Treatment

At this stage the most effective means of recovery is rest, although some research recommends light aerobic based activity to decrease the severity of the soreness.

INJURY PREVENTION

Introduction

Most exercise-induced injuries can be prevented through knowledge, forethought and common sense. The worldwide golden rule of '*prevention is better than cure*' could not be more true and from knowing the causes of injuries we can prevent them.

Overtraining

Overtraining or overtraining syndrome is caused by a continual and accumulative stress placed on the body. It is commonly caused by excessive training without sufficient recovery periods thereby exceeding the body's ability to recover. The result, more breakdown than build-up.

Causes

The basic cause is training excess, either through excessive frequency, intensity, time, overload or inversely a lack of rest. Furthermore, a bad diet and lack of sleep can also contribute to the condition.

Signs and Symptoms

Basic signs and symptoms include:

- Continual muscle soreness.
- Elevated resting pulse.
- Decreased appetite.
- Sudden weight loss (due to the loss of muscle tissue not fat).
- More susceptible to colds, flus and viruses.

Recovery

Decrease your personal training intensity and volume.

Fitness standards

One of the most common causes of injury amongst those training for health and fitness from beginner to advanced athlete is training or progression error. Simply put, doing too much too soon.

Workloads

By attempting to do too much too soon we invite injury. Fired up and ready to go, you eagerly go for two hour walk on the first weight load walking session of your program. Prior to the program you had never walked for more than 60 minutes in your life. Then next morning the front of your shins and the arches are on fire.

Recommendation. Stick to the workload recommended in the program.

Skill

By participating in an activity where your skill level is not high enough to be in that particular division or by performing an exercise you are not capable of, you risk injury. Could you imagine, with no skill training attempting to do a back somersault. What do you think your chance of injury is?

Recommendation. Only do the exercises prescribed in the program, avoid trying some new fad down in the gym.

Recovery

The body takes time to adjust and recover from a training session. If your body has not fully recovered from the last session obviously it is susceptible to an over-use injury.

Recommendation. Use the recovery periods included in your program for recovery.

Thorough preparation

Before any activity is commenced a thorough warm up should be conducted to prepare the body for the exertion to come. Stretching/range of motion exercises should be performed to ensure the muscle is capable of moving through the range required. In line with the warm up, the body should be cooled down after training. Stretching should again be included to return range of motion to the contracting muscles. Classic examples of not warming up thoroughly are runners and those who play with balls. Runners, set their watches and off they go with little progression and most of the time no true range of motion work. Those who play ball sports, be it netball, football or squash, usually start playing with the sports ball immediately upon arrival at the training venue, often injuring themselves executing a kick, throw or action that their body is not ready for.

Recommendation. Follow the session guides and warm up and cool down every session.

ILLNESS

Illness can be described as an injury to the biological systems of the body; many of them are preventable through basic hygiene knowledge.

Viral and fungal illness

Both viral and fungal infections are common amongst athletes as they are normally in an environment of close proximity and, if over trained, their immune systems vulnerable.

Prevention

The following measures can decrease the chance of contracting a viral or fungal illness.

- Do not share water bottles, towels or unwashed clothing.
- In common shower, spa and sauna areas wear footwear.
- Always use towels on weight benches and aerobic floors.
- Wear clothing that breathes eg cotton.

Training

Training with a cold or infection will cause a further deterioration in your condition and delay your recovery time. Your immune system is also overloaded trying to cope with the illness and your recovery from training takes longer, opening up the possibility of over training and injury.

Heat illness

Exposure illnesses such as heat stress, heat stroke etc are other forms of illness that may be suffered by trainees. These illnesses are extremely common in mild forms and in the more severe cases can cause death.

Prevention

In order to avoid heat illness:

- ensure you wear appropriate clothing for the weather;
- if it is hot, wear clothing that can breath, like cotton;
- wear hats and sun block to avoid burning;
- hydrate (drink fluids) on hot days and during any activity regardless of weather; and
- avoid training during the hottest or coldest times of the day.

Dehydration

Definition

Dehydration is the lack of sufficient water in the body, water that is necessary for energy production, heat regulation (temperature control) and the removal of waste products. Not only does dehydration increase the risk of heat illnesses but it also reduces endurance capabilities.

Signs and symptoms

Common signs and symptoms include;

- thirst,
- strong thirst (NOTE: thirst may be a late symptom and is not reliable),
- dry mouth,
- nausea, and
- light headiness and difficulty concentrating.

Causes

There are several generic causes of dehydration, all of which can individually or as a group lead to dehydration.

- Weather/humidity. The more humid the weather the less effective sweat becomes as a coolant.
- Clothing. Clothing that does not allow sufficient heat loss increases the body's need to use fluids to cool itself down.
- Consumption of Diuretics. Diuretics cause you to urinate and thus lose body fluids. Drinks like alcohol and coffee can dehydrate the body.

Prevention

The following procedures can assist in preventing dehydration:

- Hydrate yourself with sufficient water.
- Do not train during the hottest hours of the day.
- Wear clothing that allows heat loss.
- Use a sunscreen to avoid being burnt.
- Ensure your nutritional intake is adequate during the day (your body gets its electrolytes from food).

How to hydrate

The following steps provide a guide as to how to maintain a good state of hydration.

- Drink 400-600 ml of water before exercise.
- Drinking 100-200 ml of water every 10 to 15 minutes of exercise (approx. a mouthful). **NOTE:** Over consumption of water can be just as harmful as insufficient water so control your intake.
- Drink on schedule rather than relying on thirst.
- Drink cool water as this is more palatable and, by reducing the temperature of the stomach, fluid flow from the stomach to the small intestine is increased.¹
- Continue water consumption well after your session concludes.
- Check on water output (urine). It should clear and not concentrated (yellow / dark yellow).

¹ E. Coleman, *Diet, exercise and fitness*. Neutral Bay, NSW: Network, 1995

What to drink

Cool water is still one the best forms of hydration and for your basic participant is all that is required. Those who train aerobically for over an hour may consider using a carbohydrate replacement drink. The most effective drinks contain 6 to 8% carbohydrates. Beverages that exceed 10% carbohydrates (sodas, fruit juices and other concentrated fructose drinks) are associated with cramps, nausea and diarrhoea.²



SUMMARY

Be aware that some dangers are internal, which means that unless professionally diagnosed you do not know about them.

Always remember the golden rule "Prevention is better than cure." If you get injured or ill, **STOP** training immediately and get the ailment diagnosed and treated. The longer you wait the worse it will get, meaning a longer recovery time and a greater delay in reaching your goals.

Only you can look after your body, remember it is the only one that you have.

² Ibid

CHAPTER 6

NUTRITION AND A HEALTHY LIFESTYLE

FOODS AND MEALS

Introduction

Carbohydrates, fats, proteins, vitamins/minerals, fibre and water are the basic nutrients that, when taken in the proper amounts, allow the body to perform its many and varied functions. They are the fuel for muscles, for daily maintenance and repair, for chemical changes within the body's powerhouse - the cell, and perform many other functions. A point to remember is that it is extremely difficult to classify foods eg. a carbohydrate food, because food is a combination of nutrients.

Each of these basic nutrients has functions, some supplement each other, some rely on each other for best function whilst others are specific and independent.

Carbohydrates

Carbohydrates (CHO) are the body's primary source of fuel and include sugars and starches. Simple CHO are made up of simple molecules, whilst complex CHO are made up of complex molecule strings. Breads, cereals and green leafy vegetables are the major sources of CHO.

Proteins

Proteins are the building blocks of the body and are made up of chains of amino acids. Found in eggs, meat, poultry, fish and dairy products (like milk and cheese) proteins are used to build muscle. Excess protein is converted to fat.

Fats

Fats can be found in both plant and animal foods and are generally greasy to touch. Regardless of its nature fat is commonly seen as the substance that alters body shape from its natural muscular structure into a round shapeless form. It does however have several important bodily functions. These include:

- protecting organs,
- acting as an insulator,
- storing some essential nutrients that are not water soluble, and
- providing a form of stored energy.

Contrary to popular belief, however, all fat is not bad. In fact some fats, like omega three and omega six fatty acids, are required for the maintenance of good health. Other fats however, like saturated fats from animals, cheeses and ice-cream, can create health problems when eaten in abundance. The general categorisation of fats and where they are predominantly found is shown below:

- Omega fatty acids are found in fish, seafood and some plants;
- Unsaturated fats, which comprise of:
 - Polyunsaturated fats, found in sunflower and corn oil, soybean and some fish; and
 - Monounsaturated fats, found in olive and canola oil; and
- Saturated fats, found in animals, milk products, cream and ice cream.

Vitamins and minerals

Vitamins and minerals have the primary role of maintaining the body. Vitamins are organic food substances that cannot be produced by the body. Divided into two categories; water soluble and fat soluble, vitamins have the role of reacting with proteins, fats and CHO. Minerals repair and resupply the basic framework of the body like the bones, muscle and skin. They are also responsible for regulating the acid/alkaline ratios within the body and assist in drawing chemicals into and out of the cells.

Fibre

Dietary fibre is the digestion resistant portion of plant foods that cleans and maintains the gastrointestinal tract. It slows down the release of sugar thus controlling blood sugar levels and giving a sustained release of energy. Too much fibre however can interfere with absorption of some minerals.

Water

Water is one of the most important nutrients for the functioning body. A drop in water of only 2% body weight can lead to impaired physical performance.¹ Water assists in body temperature regulation and without sufficient quantities, dehydration, heat related illnesses and death would result. As a general guide, you should consume 33 millilitres per kilogram of body weight in water per day.²

THE FIVE FOOD GROUPS

Foods are "grouped " into five basic groups.

- Group 1: Bread and cereal group consists of all grain products like bread, cereal, pasta and rice.
- Group 2: Fruit and vegetable group consisting of fruits and vegetables.
- Group 3: Meat and meat alternative group consisting of meat, poultry, fish, eggs, lentils and nuts.
- Group 4: Milk and milk alternative group consisting of milk, cheese and yoghurt.
- Group 5: Fats and oils consisting of butter, margarine, salad dressings, cream and oils.

DIETARY FAQS

How much food should I eat?

As a general rule, the serving per day should be:

- 4-5 serves bread cereal group (ie 5 slices of bread);
- 4-5 serves of vegetables (cooked or as a salad) or fruit;
- 2 serves of meat or meat alternative group (only 100-150 gm meat);
- 1 serve milk or milk alternative group (600ml); and
- 1 tablespoon of fats or oils.

When eating you should eat slowly, allowing your gastric fluids time to digest the foods. Many people eat too rapidly and by the time the mind registers the fact that they are full, they end up over eating and go from full to bloated as the body breaks the foods down.

¹ K.E. Inge, & S.P. Haynes, Nutrition and Drugs in Sport in '*Better Coaching Advanced Coach's Manual*' ed. F. Pyke, Belconnen, ACT: Australian Coaching Council, 1991

² Wilmore & Costill, *op cit*, p.363

How often should I eat?

Most people think the less often they eat the better, especially if they desire to lose weight. Research has shown, however, that you eat more energy (kilojoules) in one large meal than you would if you eat small meals often. Your body also starts to hoard fats and carbohydrates in case this sudden fast lasts and finally your malnourished muscles breakdown (atrophy) to provide energy therefore your sedentary fat burning (basal metabolic) rate drops. The body works best on small meals taken every two to four hours whilst awake.

SOME GENERAL MEAL GUIDELINES

Breakfast

Breakfast should be your best meal as this is the meal that breaks the fast caused by sleep. A wholesome breakfast gives the body the energy to start the day. Suggestions include:

- 2 slices wholemeal toast with a scrape of margarine/butter, spread of conserve or fruit.
- Porridge or wholegrain cereals, low fat milk and fruit.
- Fruit and yoghurt.
- Water, fruit juice, tea or coffee.

Mid morning

The dreaded morning tea of pies and coke or sugar and sweets should be avoided at all costs, (after all we did not miss out on breakfast). Suggestions include:

- 2 slices wholemeal bread with a scrape of margarine/butter, lean meat and salad (can be toasted).
- Fresh fruit.
- Fruit and yoghurt.
- 2 rice cakes or dry crackers with banana (and a little honey).
- Wholemeal pikelets with jam (no cream).
- Wholemeal scones (spare the butter and cream).

Lunch

Those heavy high fat meals will not only weigh you down, but will send you off looking for a corner to take a nap. Suggestions include:

- Lean meat and salad with a wholegrain bread roll followed by a piece of fruit.
- Pasta or rice dish or rice/pasta with salad.
- Soup and crackers.
- Water, soda water, low fat milk, fruit juice, herbal tea, tea or coffee.

Mid afternoon

Similar items to those suggested at morning tea can be eaten here. If you crave something sweet by this time of day, try a bowl of low joule jelly and fruit.

Dinner

This should be your smallest meal as at night your metabolic (fat burning) rate drops. Eating too much at this meal is either because you have not eaten enough during the day or as a matter of habit. Eat slowly, sip on water and eat as many vegetables as possible so that you feel full. Suggestions include:

- Lean meat, chicken fish with vegetables or salad and bread roll.
- Spaghetti or a pasta dish with a side salad.
- Stir fry vegetables and steamed rice.
- Fresh fruit platter.
- Fruit and low fat yoghurt.
- Fruit and low fat custard or jelly.

Supper

Try to have a glass of warm milk and a plain biscuit or a slice of toast.

General guidelines

- Try to reduce the consumption of snacks that are high in sugar or fats (such as cakes, biscuits, hot dogs, potato chips, bar snacks). Use snacks of fruit and/or nuts.
- Limit your intake of salt by not adding it to food or to cooking.
- Drink alcohol moderately, or not at all.
- Patronise fast food restaurants less frequently because their menus are often high in fat and salts.
- Drink more water.
- Carry snack foods like sliced carrot or celery with a small salsa dip with you if possible for those snack attacks rather than buy take away.

In summary, eat breakfast like the queen, eat lunch like the prince and eat dinner like the pauper.

DIETING

Forget any fad dieting books you may have read - DIETS DO NOT WORK. The word 'diet' is seen by many as a temporary adaptation to their eating habits in order to lose fat. First problem - what happens when your diet finishes? Well you put the weight back on (hence the term 'yo-yo dieting'). Secondly, if you lose weight too quickly your body does not adjust its set point and soon as you cease the diet the weight returns. Thirdly, much of the weight lost initially is water or muscle not just fat.

Concerns with dieting

Diets are only temporary solutions and eventually you will regain the weight lost. The concept of being on a diet, as described by the Macquarie dictionary, involves 'following a prescribed diet, esp. so as to lose weight'.³ We are only human and it is not if but really when you will break your diet by eating something 'not prescribed'. Breaking your diet often leads to guilt, anger and frustration when your body is only trying to maintain its balance. Magrann (1995) explains that 'crash diets and fad diets are self-defeating. Limiting caloric intake too severely makes you more likely to binge when confronted with tempting foods.'⁴

³ Macquarie Dictionary, ed. A. Delbridge, Ken Fin Books, NSW, 1992

⁴ S. Magrann, Weight control and eating disorders, Nutrition Dimension: Electronic Publishing Company, 1995, p.52

The 'Yo-Yo' effect

The 'Yo-Yo' effect can be explained by the process of first losing weight, when dieting, then regaining the weight post-diet, then losing weight again when dieting again and once again gaining the weight when you stop. This up and down 'yo-yo' effect can be explained by the 'set point theory'.

The 'Set Point Theory'

This is one theory explaining the return of lost weight. This theory reasons that the body has a set weight that it tries to maintain. If the weight is lost too rapidly, the body will firstly decrease your basal metabolic rate (rate at which body utilises fuel for every day function) then cause hunger. This hunger will last until enough calories are consumed to return the body to its set point. It is proposed that this 'set point' is lowered by exercise and raised by fat and sugars.⁵ Another factor supporting this theory is that, the initial loss of weight in most diets comes from fluid loss⁶ and once normal eating habits are resumed the body restores the lost fluids.

The no-diet diet

The 'No-Diet' Diet is the most effective way to loose fat. It involves a behavioural modification to lifestyle and eating habits. Notice the word is modification, not cessation or elimination. What do you need to do?

- Monitor what you eat and gradually adjust quantities and qualities. For example, if you notice that during the day you might eat a hamburger, fries and a chocolate bar for lunch, adjust your eating by trying a healthy sandwich, fries and a smaller chocolate bar. The difference is not to STOP eating all the foods you like but rather modify what you eat, 'give and take.'
- Eat slowly, this will give the brain time to register satiety, and you will avoid eating until you feel bloated.
- Drink lots of fluids (water) with your meals. This will increase your satiety without increasing your calories. Therefore you can eat smaller portions. You may become hungry more often, especially if your body needs the calories, this is natural. However, eating foods in smaller portions through out the day is more effective for fat loss than eating three big meals. This process, called thermo-grazing, increases calorie usage by increasing basal metabolic rate. By eating several smaller meals, the body has an increased basal metabolic rate several times a day.
 - Do NOT feel guilty if you eat high fat foods occasionally, you are human. Have the slice of chocolate cheesecake when you go for coffee with friends but not every time you drink coffee. Remember, everything in moderation.
 - Increase your physical activity; this increases the calories you burn throughout the day. Weight training increases lean body mass causing your basal metabolic rate to increase. This means you will burn more calories when you are doing nothing.

The key point is to avoid 'dieting' (unless on a specified diet by a suitably qualified medical professional). Instead, modify your eating habits to those that follow the Australian Dietary Guidelines.

⁵ Magrann, *op cit*

⁶ Wilmore & Costill, *op cit*

SPORTS SUPPLEMENTS

The fitness industry is inundated with 'quick fix' solutions, many of which contravene the concept of health and fitness. Consider for example anabolic steroids, they may well give the external appearance of a fit body but what about the internal effects? Liver damage and sexual, reproductive and psychological disorders are the more common side effects from steroids. These side effects do not improve health and fitness.

An important point to consider in regard to the claims made by 'wonder supplements' is that many of the health and fitness magazines are either owned by or sponsored by supplement companies..

- 'There is little or no scientific evidence supporting positive effects on muscle growth, body fat reduction or strength for the following supplements: Amino Acids (Arginine, Lysine and Ornithine), Ornithine alpha-ketoglutarate (OKG), Inosine, Choline, Vitamin B12, Carnitine, Chromium, Medium Chain Triglycerides, Omega -3 Fatty Acids and Gamma Oryzanol' ⁷
- 'Studies on supplements containing all 20 amino acids have not been found to influence testosterone or Human Growth Hormones (HGH).'⁸
- 'Long term supplementation with multivitamin/mineral compounds does not enhance sport performance.'⁹
- 'It has been suggested and acknowledged by many sources that to maintain or possibly increase muscle mass a protein RDA of 1.5–2.0 g/kg of body weight is needed. What many neglect to state is that this 'additional energy and protein may be obtained from a balanced healthy diet'¹⁰
- 'Every two or three years the newest and most fashionable 'wonder supplement' creates 'anticipatory excitement that it will produce quick and gratifying results. However, science eventually shows that, like others before it, the supplement just does not live up to the claims and hype.'¹¹
- 'There is no substitute for engaging in an optimal resistance training program and consuming a sound overall diet.'¹²
- 'It is my judgement that there is no conclusive evidence that dietary supplements are effective in enhancing muscle mass as long as the individual eats well and does high-quality resistance training.'¹³
- 'For athletes who eat optimal diets, there is no solid evidence that protein powders or amino acids build muscle mass.'¹⁴

⁷ M.H., Williams, Nutritional supplements for strength trained athletes, *Sports Science Exchange* 47, Chicago, IL : Gatorade sports science institute, 1993, Vol 6 :No 6, 1993

⁸ *Ibid*

⁹ *Ibid*

¹⁰ *Ibid*

¹¹ E.R. Eichner, D. King, M. Myhal, B. Prentice, & T.N. Ziegenfuss, 'Muscle Builder Supplements' *Round Table* 37, Chicago, IL : Gatorade sports science institute., 1999, Vol 10: No 3, 1999

¹² *Ibid*

¹³ *Ibid*

¹⁴ Eichner, et al. *op cit*

- 'Athletes should place most of their emphasis on training and optimal nutrition.'¹⁵
- 'Advertise claims to the contrary, many supplements have not been subject to the scientific scrutiny required of prescription drugs.'¹⁶
- 'No well-designed study has yet shown that amino acid supplementation enhances performance.'¹⁷
- 'The purity of agents available is in doubt.'¹⁸

Summary

Most of the claims made by supplement companies are not scientifically recognised and published in scientific journals. Although athletes may require more protein in their diets, most are already consuming the amount required. In conclusion, eat well and train hard and only take supplements when recommended by a health professional (ie doctor or dietician).

SMOKING

Introduction

It is ironic to think that if you were asked you to suck on the exhaust fumes of a car through a pipe or to swallow a substance that will cause your lung walls to rot and cause cancer, or even swallow cyanide, most of you would decline the offer. Yet how many people do this voluntarily? How many people smoke cigarettes? Many knowing that there are over 4000 chemicals in cigarette smoke including Tar, Nicotine, Carbon Monoxide and Hydrogen Cyanide.

The poisons

Tar. Tar is a thick dry substance made up of many chemical agents, including some that are medically listed as carcinogenic (cancer causing). It is tar that forms the 'paste' that builds up in smoker's lungs.

Carbon Monoxide. Carbon Monoxide is a poisonous gas with no colour or odour that is commonly found in a car's exhaust. This chemical bonds to the Haemoglobin in the blood (the pigment used to pick up and carry oxygen to the working body) more than two hundred times more effectively than oxygen. This means that there is less oxygen flow to the systems of the body, including the brain, the heart and the working muscles. For an athlete this means decreased aerobic performance. In fact it takes only one cigarette for:

- breathing rate to increase;
- blood pressure to increase;
- resting, sitting and working heart rate to increase;
- body temperature to decrease; and
- the extremities to receive less blood.^{19, 20}

¹⁵ T.D. Armsey, & G.A Green, Nutritional Supplements: Science vs Hype, *The Physician and Sportsmedicine* McGraw-Hill, Inc., 1997, Vol 25: No.6 Jun 97

¹⁶ *Ibid*

¹⁷ *Ibid*

¹⁸ *Ibid*

¹⁹ de Vries & Housh, *op cit*

²⁰ Inge & Haynes, *op cit*

These changes begin to occur within seconds of inhaling cigarette smoke. Fox, Bowers & Foss (1993,p.217) state that 'during heavy exercise the oxygen cost of ventilation in chronic smokers was found to be on the average two times that of non smokers.' This means that not only do smokers have to work harder to perform at the same physiological level as a non-smoker, but their fitness gains are also lower when compared to a non-smoker.²¹ In fact cigarette smoke is so potent that even passive smoking has been shown to decrease sporting performance.²²

Nicotine. Nicotine can be described as an addictive drug that maintains the tobacco habit. It is a drug with NO therapeutic application.²³ In fact, it forces the heart to beat harder and faster, increases blood pressure and simultaneously stimulates sympathetic ('switch on' system), parasympathetic ('switch off' system) and the central nervous system

Summary

Unfortunately, despite many people now have a greater understanding of how detrimental smoking is to health, fitness and fitness gains, they will still continue to smoke because giving up is hard and their will power is weaker than the craving. On a more positive note, although failing the first, second and even third time, many do quit the hazardous habit. The first step toward quitting is taking a real look at the impacts smoking has and deciding it is one habit you would rather be without.

ALCOHOL

Introduction

Alcohol is, in fact, classified as a drug and grouped with central nervous system depressants. It is also classified as a food as it has a caloric value (146 calories per 12oz can).²⁴ However, it has no vitamins or proteins.

The effects of alcohol

As with other drugs of its class, alcohol has several negative effects, even in small doses, on athletic performance, including:

- increasing reaction time;
- decreased movement time;
- decreased information processing;
- decreased balance;
- decreased accuracy;
- decreased sensorimotor coordination; and
- most importantly, it may decrease strength, power, muscular endurance, speed and cardio respiratory endurance.

Furthermore, alcohol suppresses the release of ADH (antidiuretic hormone), thus causing your body to excrete more water in your urine. This in turn dehydrates the body and lowers the blood pressure, a most undesirable effect for an endurance athlete (this includes those playing team sports that last for longer than 40 minutes). Ironically, most sports players conclude a game by going to a 'sportsman's club' and/or 'having a few'; thus dehydrating the body further.

²¹ Inge & Haynes, *op cit*.

²² Australian Sports Drug Agency, *Tobacco*, Canberra;ACT, n.d.

²³ S.K. Powers, & E.T. Howley, *op cit*

²⁴ S.M. Kleiner, In high spirits?: Alcohol and your health, '*The Physician and Sports Medicine*' McGraw-Hill, Inc. Vol 24 No.9 Sep 96, 1996

Weight gain

Although alcohol has no fat in it, it does have calories, and on the basic scale of input vs output, for the 'average lifestyled' person, drinking alcohol means that there are more calories you have to burn off (remember that there is no nutrient gain from alcohol). Furthermore, the diuretic (water loss) effect of alcohol means you need to drink more, thus even more calories. Finally, add the salty bar snacks, thus even more drinks, and their high saturated fats, yet more calories and drinking alcohol will increase your 'workload' when attempting to lose fat.

Injury risk

Another major concern is the increased risk of musculo-skeletal injury created by both the decreases in skill level and the sensory (pain) suppressant nature of alcohol. Add to this the detrimental pathological changes that excessive alcohol consumption can induce to the heart, brain and muscles and both acute and chronic injuries become a concern. On the injury treatment and rehabilitation side, alcohol causes the arteries to vasodilate (expand) thus increasing blood flow. The last thing you want to an injured site is to increase its blood flow, which in turn increases swelling and inflammation. This is why the Australian Sports Medicine Federation uses the 'No HARM' acronym for injury treatment, with A standing for NO alcohol.

Positive effects

Some current evidence²⁵ suggests that drinking in **moderation** (that is one drink per day for females and two drinks a day for males) is associated with a lower risk for heart disease in **some** people. This is achieved by the increase in high-density lipoprotein cholesterol (good cholesterol) levels, in your blood. The higher this level, the lower your risk of heart disease.

Course of action

For those who like a drink of alcohol the following recommendations are made:

- If you are considering drinking alcohol for the above mentioned 'health' benefits, you can achieve these gains by exercising and not smoking. This will give you the gains without the negative effects associated with drinking alcohol.
- If you have a drink, drink moderately, enjoy the occasional glass during the week as opposed to the dangerous 'binge' on the weekend (usually prior to or directly after a game).
- If you are a binge drinker, realise it for the true condition it is and see someone to fix this problem.
- Avoid alcohol 24 hours prior to a competition or physical event.
- For every alcoholic drink have a glass of water.
- Drink only water for the first hour after a game, and if injured do not drink alcohol AT ALL.
- Be a leader not a follower, set your drink limit, and stick to it, regardless of the environment around you.

Summary

Perhaps the most important advice is the simplistic yet factual statement 'everything in moderation'. Drinking excessive alcohol will always have a negative side effect, whether it be to your body, mind, or social/military status: there is no such thing as 'I can handle myself when I'm drunk.'

²⁵ Hartung 1990 as cited by the S.M. Kleiner , *op cit*, p.2.

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