



A Guide to Fitness for Referees

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FOREWORD AND ACKNOWLEDGEMENT

Refereeing football is essentially an endurance task, but the physical demands on the referee will vary from match to match depending on the style of play and the skill and fitness level of the players. The question often asked is “how fit do I need to be to referee?” Simply you do need to have a degree of fitness commensurate with the level of football you are refereeing.

Man’s inventiveness and intellect have resulted in a rapidly changing and increasingly sophisticated environment. The pace of technological development has been such that our body has not had a chance to adapt. Machines have made us redundant in many areas of physical activity, especially in our place of work and in our travelling to work. Fortunately, there are no machines good enough to take over our duties as a referee.

Some of us are more concerned about servicing our car than we are about maintaining our body. A well-tuned car will respond to the opportunity to show its paces along the motorway, quickly settling into an easy rhythm and gently purring along. If we were to take a poorly maintained car on a similar journey and try to drive it in the same way, the chances are it would give up the ghost and have to be rescued and towed home. It is a sobering thought that our body would probably react in exactly the same way. If it is in good physical condition it will respond comfortably to any reasonable demand made upon it, but if it has not been well looked after the likelihood exists it may refuse to co-operate and it too may need to be rescued. Our current lifestyle may have led us to become complacent about the need for physical fitness and, therefore, under prepared for the rigours of the modern game.

The Football Association is very keen to raise the awareness of every referee, at whatever level, to the major improvement in refereeing performance that can be gained by a high level of fitness. One of my Regional Referees Managers has been appointed to spearhead developments in this field to include:

- Developing programmes of physical training for all stages and all ages of referees
- Developing a programme of physical training sessions to enable referees to train together in their local area.
- Preparing advice and information to be circulated to referees to encourage healthy lifestyles and an appropriate diet to support their refereeing activity.

To help with this development an Area Fitness Training Co-ordinator has been appointed to each of the Area Training Teams that make up the support network for referees in this Country. Also, a number of Fitness Training Leaders have been appointed to each County, to organise fitness training sessions for the benefit of all referees.

Physical fitness is not all about fitness tests. It is much more to do with preparing for fitness. This booklet offers general advice and guidelines on how to become fitter and better prepared, both physically and mentally, to officiate in the modern game. There are measures included to give you an indication of how well you are doing.

The Football Association is very grateful to the high levels of expertise it has been able to call on to give authority to this booklet.

The Football Association is committed to giving its referees the best preparation possible. This booklet certainly makes a significant contribution to these aims.

Thought — Being physically fit is no longer the basis of our survival but it will help us survive longer as a referee.

“By failing to prepare you are preparing to fail” — Abraham Lincoln

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Ian Blanchard
Head of National Referee Development
July 2006

The Football Association

To find out where your nearest supervised referee fitness training programme is based, contact either your County Football Association or The Refereeing Department at the Football Association. You can also look in the Refereeing Section of the FA Website www.The FA.com

YOUR RESPONSE TO EXERCISE

What do you notice happening to your body when you exercise? The list would probably go something like this:

- Your heart beats faster
- You breathe more deeply and more frequently
- You sweat and feel hotter
- You feel thirsty
- You change "colour" — your skin becoming "flushed"
- You can feel your pulse beating
- Your muscles may begin to ache
- You may feel light headed and not as mentally alert

Obviously the body is trying to tell you something. There has to be a purpose to these changes or else the body would not bother. It is saying "If you are going to be doing this, I need extra resources". Let's take a look at some of the clues.

YOUR HEART BEATS FASTER AND YOUR PULSE FEELS STRONGER

Fact — Your heart is a muscle and its function is to pump blood around your body. Blood is the transport system for your body and carries the fuel and nutrients your body requires. Your heart is approximately the size of a clenched fist and weighs about 300g. It also holds about 70ml of blood (4.5 tablespoons) or about 1ml for every kilogram of your body weight. At rest your heart rate averages about 72 beats per minute so the amount of blood being pumped around your body each minute is $70 \times 72 = 5$ litres.

Fact — During moderate exercise, such as steady running during a game, your heart will respond to the increased demands for resources by slightly enlarging, thus allowing more blood to enter your heart, and by increasing the number of beats per minute. This allows more blood to be pumped around your body i.e. $80 \times 130 = 10.4$ litres. As the intensity of your exercise increases e.g. you have to sprint, heart rate increases still further so more blood can be circulated e.g. $80 \times 170 = 13.6$ litres.

Reason — Your body is asking for deliveries to be increased to meet the new demands. With nearly three times the volume of blood flowing around your body it cannot be surprising that awareness of your pulse beating is also enhanced. Because of the greater volume and the increase in the speed at which your blood is flowing, your heart would have to pump harder, and your blood vessels expand, to meet the demand. Your heart is beating more strongly so you feel the blood pulsating.

Thought — An Olympic athlete can reach a level of 40 litres per minute!

YOUR BREATHING IS MORE FREQUENT AND DEEPER

The message here is quite simple. Your body is asking for more oxygen to cope with the demand for a greater fuel supply to your working muscles.

Fact — The oxygen you require is breathed in through your nose and mouth and passes down your bronchial tubes and into your lungs which are made up of over 300 million tiny air sacs called Alveoli. It is here the oxygen transfers itself to your blood to be transported around your body.

Thought — If you were to flatten out the surface of your lungs it would cover an area of between 150—300 square metres.

Bearing in mind only 80ml of blood is circulated per beat of your heart during exercise, that is a lot of surface area over which to spread such a small amount of blood. It means the blood can be spread very thinly and this speeds up the transfer of oxygen.

Thought — Put another way, one person getting onto a tube is quicker than 30 people trying to get aboard during rush hour!

Fact — When resting you usually breathe in about 500ml per breath and you do this 12 times per minute. This would give you 6 litres of air. When you are exercising it is quite reasonable to take in 2300ml per breath and your breathing rate could increase 2 or 3 times.

Thought — This means you would be taking in up to 80 litres of air.

How you breathe is also very important to you. Is it better to take slower deeper breaths or faster shallower breaths? The answer lies in understanding the mechanics of breathing.

Fact — When air is taken in, a small amount (150ml) remains in your air passages and never reaches your lungs. This is known as the 'Dead Air Space'.

Say, in slow deep breathing you were to breathe in 1000ml of air, the amount of air reaching your lungs would be $1000 - 150 = 850\text{ml}$. If the number of breaths per minute is 16, the total air breathed in for one minute is $1000 \times 16 = 16$ litres. The total air reaching your lungs, however, is $850 \times 16 = 13.6$ litres.

By halving the amount of air breathed in and doubling the number of breaths per minute as in faster shallower breathing, the total amount of air taken in remains the same i.e. $500 \times 32 = 16$ litres.

However, the amount of air reaching your lungs is greatly reduced. $500 - 150 = 350 \times 32 = 11.2$ litres (instead of 13.6 litres).

Advice - Slow deep breathing is more efficient than rapid shallow breathing in increasing air flow to your lungs.

YOU SWEAT, FEEL HOTTER AND “FLUSHED”

Fact — When you exercise the muscles are used more and as a result produce heat. This heat needs to be dissipated and your body loses heat in two principal ways. Firstly, your sweat glands are stimulated to secrete fluid, which then evaporates on the surface of your body to produce a cooling effect. Secondly, your small blood vessels near to the surface of your skin enlarge to allow more blood to flow closer to the surface where cooling can take place. This is what makes you feel “flushed”. Your body is telling you it wants to cool down so you should help it.

Thought - The mere process of sweating is not in itself a cooling process. The liquid sweat must be allowed to evaporate before any heat loss occurs.

Advice - On a hot day you should try and wear a short-sleeved shirt, or at least have the sleeves rolled up, to allow more skin surface to be exposed to the air.

YOU FEEL THIRSTY

Fact - Exercise will increase the temperature of your body and your body will try to reduce the temperature by secreting fluids. These fluids come from the reservoir of fluids contained in your body. If the fluids are not replaced the level in the reservoir will go down and eventually this will trigger a feeling of thirst.

Thought - Thirst is a poor indicator of fluid needs as by the time the feeling of thirst has been registered the level of your reservoir is already quite low. Prolonged periods of intensive exercise can result in fluid losses of up to 2—3 litres. This results in dehydration which will not only adversely affect performance but can also be dangerous.

Advice - Fluid, especially water, should be regularly consumed before, during and after training or matches to continually top up your reservoir and prevent you feeling thirsty.

YOUR MUSCLES ACHE

So far, the reason for all this activity by your body has been to ensure your muscles receive an adequate supply of fuel and nutrients to enable them to work and propel you around the field of play. One of the by-products of all this activity is heat, but there are other waste products as well to be dealt with.

Fact - In moderate exercise your body may be able to remove these waste materials as they are produced, but as the intensity or length of the activity increases, the build up of these waste products occurs faster than they can be removed. The waste materials occupy space previously available to the fuel and nutrients in your blood, so as they build up, your blood supply to carry them away decreases. Without oxygen and nutrients the efficiency of your muscles diminishes, waste products swell your muscle, and muscle soreness ensues.

Reason - Your body is telling you it is getting tired and will soon need a rest. The fitter you are the longer you will be able to exercise before the waste products begin to swell your muscles.

Tip - When such soreness occurs, stretching the muscles involved will assist in reducing the pain and discomfort.

YOU FEEL LIGHT-HEADED AND MENTAL ALERTNESS IS REDUCED

So far, you know the reason for all the changes occurring in your body are related to getting more fuel and nutrients to your working muscles. In most cases in life when demand increases, additional resources are sought and brought into play to meet the demand. Blood is your transport system but you cannot suddenly inject a few extra pints, you have to use what is already there.

Fact - When you are going about your everyday lives, blood is circulating to all parts of your body. When demand increases for more fuel to be taken to working muscles, your body responds by reducing your blood supply to some organs not immediately involved in the activity. It is then redistributed to the areas in need. This means that organs such as your liver and stomach will have their blood supply reduced so that more blood can be taken to your muscles.

Thought - It is unwise to eat a lot of food prior to exercising, as with a reduced blood supply the food cannot be broken down and carried away quickly. It remains in your stomach longer and can cause nausea and stomach cramps.

Fact - Your brain is another part of your body that finds itself having to deal with a reduced blood flow and the diminished oxygen supply may well make you feel light-headed and cause your concentration to lapse. In severe cases it could cause you to collapse.

Tip - The fitter you are the more efficiently the oxygen can be transferred to your muscles. As the oxygen flows to your muscles more easily they get all they want without having to call on all your extra supplies of blood. Oxygen reduction to your brain is, therefore, decreased.

DO YOU NEED TO KNOW ALL THIS TO BE A REFEREE?

No you don't, but at least you know what your body is trying to do to help you referee.

Thought - Why not support your body and make refereeing a joint effort. You will become a better referee if you and your body practise together. With practise your body will perform its tasks better, leaving you to concentrate on performing well as a referee.

Advice - Ignore these requests at your own peril.

WHAT DO YOU NEED TO PRACTISE?

Running — for sure.

Did You Know? — A referee covers between 6 and 12 kilometres during a game depending on the level of the competition.

Fact - Research carried out at Liverpool University in 1993 on 11 Football League Referees and 3 Contributory League Referees showed that they:

- Covered 9—10km during the match
- Had an average heart rate of 165 beats per minute
- Spent the major percentage of the time with heart rates above 85% of their maximum
- Varied their movements around the field to include 50% jogging, 20% walking, 20% reverse running and 10% sprinting.

Tip - This is valuable information and should be used to help you devise your training programmes.

(i) DISTANCE

There is nothing wrong with going for a run, but it is of little use if you do not run very far.

Tip - If you are expected to cover between 6 and 12 kilometres during a game then you should practise covering those distances during training.

(ii) INTENSITY

You are told that your heart rate is likely to rise to about 165 beats per minute and that for the major part of the game you will be working near to 85% of your maximum heart rate. To get benefit from this information you need to understand something about heart rates. What is your maximum heart rate, for example? Will your heart be able to cope with 165 beats per minute?

Fact — It is generally accepted that a person's maximum heart rate is equivalent to the formula $220 - \text{Age} = \text{Maximum Heart Rate}$. So a young, healthy 20 year old referee could expect to have a maximum heart rate of 200 beats per minute. If this referee had a heart rate of 165 beats per minute during a game, then that would correspond to 82.5% of the maximum heart rate.

As you can see, a 55 year old referee working at 165 beats per minute would be working at or near the predicted maximum ($220 - 55 = 165$). The body would not be able to maintain this level for the duration of the game and so our referee would have to slow down to allow the heart rate to drop. Having said that, a referee who has trained hard over the years would have been able to slow down the rate of normal decline and even at the age of 55 years could still record a maximum heart rate well above the predicted value.

Thought - This may help to explain why some older referees are still fit enough to continue performing at the top.

Advice - During training you need to practise raising your heart rate to the level it is likely to go during a game. Jogging along slowly and steadily for 8 kilometres may cover an appropriate distance but not at the right intensity. You need to check your heart rate has increased to near match level by stopping every now and again to take your pulse. During training you should aim to increase your heart rate to between 70% and 90% of your maximum. (See chart on page 48.) If your heart rate is below 70% you are not running hard enough but if it is over 90% you should ease off a little.

(iii) VARIATION

Refereeing is not just about running up and down. During a game you would be expected to move in a variety of ways including jogging, fast running, sprinting, sideways running, running backwards, walking and even standing still. If that is what is required then surely you must practise these movements.

Tip - Running is a good basic stamina builder but you need to include the other movements so your body gets used to it.

GETTING STARTED

You have completed your basic course of training to become a referee, taken the exam, and passed with flying colours. You are now one of the elite. You are now one of the Football Association's Referees. In the euphoria you readily agree to officiate your first game at the weekend. As you proudly announce this to anyone who will listen somebody says "Are you going to be fit enough to do it?" In anticipation of this great day, of course you have been training hard for weeks, and the 6km or more you will have to run at varying speeds and directions will not cause you any problems at all. Will it? If you have been fairly active recently you will probably be fine, but if you are taking up refereeing after a long lay-off you will need to ascertain whether you are in good enough condition **before** entering the field of play.

Tip - You should always get fit to referee and not referee to get fit.

Warning - The older you are and the longer you have not been involved in physical activity the more care you must take before starting to referee. Whatever your age the amount of exercise you do should be carefully considered so you do not suffer from undue fatigue or strain. After a bout of exercise you should feel 'pleasantly tired' and not totally exhausted. If you do too much too soon you will become fatigued and the results could be harmful. Getting fit is a slow and gradual process and cannot be achieved overnight.

Advice - A medical check-up should not be necessary before you start a fitness programme. However, you should start gently and gradually increase the amount of exercise you take. Consult your doctor if you have any doubts about your health or if you have a history of heart disease, high blood pressure, chest trouble or aches and pains in your back or joints.

Thought - Fitness is not an exam, you cannot cram it all in at the end.

It is your responsibility as an active referee to attain and maintain a level of fitness appropriate to the level at which you referee.

ARE YOU FIT ENOUGH TO START REFEREEING?

You are now ready to start refereeing or you are returning to refereeing after a long lay-off and you want to find out how fit you are at the moment without causing undue stress on your body. **The Fitness Awareness Profile** can do just that, and can be carried out by yourself at home.

The Fitness Awareness Profile measures the basic essentials of physical fitness:

BODY WEIGHT; BODY FAT; FLEXIBILITY; MUSCULAR STRENGTH; MUSCULAR ENDURANCE; HEART AND LUNG STAMINA.

It consists of twelve activities, each activity being graded **A**, **B**, or **C**.

- A:** means you have done very well.
- B:** means you have reached a satisfactory level.
- C:** means this is an aspect of your fitness that needs to be improved.

Use your Fitness Awareness Profile Chart (page 45) to record your scores and tick the appropriate column. Hopefully, all of your ticks will appear in the A and B columns, but if any appear in the C column it would indicate an improvement is required. After a few weeks you can test yourself again to see what improvements have been made.

The first five activities are concerned with your WEIGHT and the amount of FAT you are carrying.

ACTIVITY 1: CHECK YOUR WEIGHT

Use the Height/Weight Chart (page 48) to find out which category you are in.

The chart can be used for men and women, as this is not a measure of body fat but of how much actual weight you are carrying around the field of play.

Score:

- A** Your weight is within the *Desirable* range.
- B** You are into the *Overweight* category by up to 4kg (9lb).
- C** You are into the *Overweight* category by more than 4kg (9lb).

Advice - It is important to weigh yourself regularly, especially if you were in, or near, the overweight column. There is no need to weigh yourself every day — once a week is quite sufficient — and if possible you should use the same scales each time. Stand evenly on the scales and wear the same amount of clothing each time, or better still wear nothing at all. Your weight will fluctuate during the day so try to weigh yourself at one particular time, either first thing in the morning or just before you go to bed.

Tip - If you are into the *Fat* category you should try to lose some weight before undertaking any strenuous exercise.

ACTIVITY 2: CHEST/WAIST DIFFERENCE

Stand with your shoulders back and your chest fully expanded. Measure the circumference of your chest just beneath your armpits. Then measure your waist at navel height, with your stomach in a relaxed position, i.e. not sucked in or forced out.

Score: *Men*

- A** Your chest measurement is 12.5cm (5in) greater than your waist.
- B** Your chest measurement is between 5cm (2in) and 12.5cm (5in) greater than your waist.
- C** Your chest measurement is less than 5cm (2in) greater than your waist - or your waist measurement is bigger than your chest measurement.

Score: *Women*

- A** Your chest measurement is 25cm (10in) greater than your waist.
- B** Your chest measurement is between 12.5cm (5in) and 25cm (10in) greater than your waist.
- C** Your chest measurement is less than 12.5cm (5in) greater than your waist - or your waist measurement is bigger than your chest measurement.

Advice - If you are heavy but score **A** on this activity it indicates you are probably muscular rather than fat. A score of **B** or **C** would suggest some of that extra weight is fat.

ACTIVITY 3: MEASURE YOUR BODY FAT

You can now analyse your fat content more closely. Too much fat tissue is not beneficial to you as a referee, so if you can find out what percentage of your body weight is actually fat, it could be a very useful piece of information for you. Too much body fat can have a far more detrimental effect on your performance than the ageing process, so you should strive to ensure you do not carry more fat than is necessary.

Thought - You can't stop yourself getting older but you can stop yourself getting fatter.

Fact - It is normal for an adult man to have about 10 - 20 per cent of his body weight as fat with 15 per cent usually considered to be average. For an adult woman the average is between 23-25 per cent fat. Very fit and active people could be well below these average figures.

Men — Measure the circumference of your neck, just below your 'Adam's Apple', and your abdomen, at navel height. Turn to the BODY FAT PERCENTAGE CHART FOR MEN (page 49) to find out your fat percentage.

Example — Neck circumference is 38cm (15in)
 Abdomen circumference is 84cm (33in)
 Predicted Body Fat is 15%

Women — Measure the circumference of your neck and abdomen as for the men. In addition, measure the circumference of your arm around the biceps, your forearm just below your elbow and your upper thigh.

Turn to the BODY FAT PERCENTAGE CHART FOR WOMEN (page 50).

Find the **points** scored for **each** of your five circumferences.

Add all the points together and subtract 55. The figure you are left with is the predicted percentage of body fat you are carrying.

<i>Example</i> - Neck Circumference is 30.5cm (12in)	8.0 points
Abdomen Circumference is 61cm (24in)	5.5 points
Arm (biceps) Circumference is 25.5cm (10in)	11.0 points
Forearm Circumference is 23.0cm (9in)	33.5 points
Thigh Circumference is 63.5cm (20in)	20.0 points
Total	78.0 points

Subtract 55 from the total ($78 - 55 = 23$)
 Predicted body fat is 23%

Score: Men

- A 18% or under**
- B between 18% and 23%**
- C over 23%**

Score: Women

- A 23% or under**
- B between 23% and 26%**
- C over 26%**

ACTIVITY 4: FIND YOUR TARGET WEIGHT

Your Target Weight is based on the assumption that men have approximately 15% body fat and women 23% body fat, and predicts what you would weigh if you had that amount of fat and no more. Everybody needs some fat on them to help insulate the body against cold and to act as a secondary energy source. If you have more fat than is recommended it means there is the opportunity to lose weight.

This is how you work it out.

STEP 1: Multiply your actual body weight by your body fat percentage.

Example: You weigh 73kg (160lb) and you have 25% body fat
 $73 \times 0.25 = 18.25\text{kg}$ of fat ($160 \times 0.25 = 40\text{lb}$ of fat)

STEP 2: Subtract your fat from your actual weight.

Example: $73 - 18.25 = 54.75\text{kg}$ ($160 - 40 = 120\text{lb}$)
 This is what you would weigh if you had no fat at all.

STEP 3: To calculate your target weight divide your fat free weight obtained in STEP 2 by 0.85 if you are a man and 0.77 if you are a woman.

Example: *Men* $54.75/0.85 = 64.5\text{kg}$ ($120/0.85 = 141\text{lb}$)
 Women $54.75/0.77 = 71.0\text{kg}$ ($120/0.77 = 156\text{lb}$)

(The reason you divide your weight by 0.85 and 0.77 is that these figures represent the amount of fat you are allowed to have. If you subtract 0.85 from 1.0 it leaves you with 0.15 which represents the 15% fat men are allowed to have. Similarly for women 0.77 subtracted from 1.0 represents the 23% fat allowed.)

STEP 4: You can now work out how much weight you should aim to lose by subtracting your target weight from what you weigh at the moment.

Example: *Men* $73 - 64.5 = 8.5\text{kg}$ ($160 - 141 = 19\text{lb}$)
 Women $73 - 71 = 2.0\text{kg}$ ($160 - 156 = 4\text{lb}$)

Score:

- A** You need to lose less than 2kg (5lb)
- B** You need to lose between 2kg (5lb) and 7kg (15lb)
- C** You need to lose over 7kg (15lb)

ACTIVITY 5: CALCULATE YOUR BODY-MASS-INDEX

This will tell you whether or not you are the right weight for your height.

Square your height in metres, write down the result.

Divide your body weight in kilograms by this number.

Example: 1.75×1.75 (height in metres) = 3.06
 73kg (body weight) divided by 3.06 = 23.8

Score:

- A** Your score is below 22
- B** Your score is between 22 and 26
- C** Your score is above 26

The next activity will measure your FLEXIBILITY.

ACTIVITY 6: TOE TOUCH

Stand up straight and bend forward at the waist until your finger tips reach the top of your toes or as near as possible to your toes.

Caution — If you have had a history of low back pain be very careful with this particular exercise. In this case it would be better if you sat on the floor with your legs out straight in front of you, then bend forward from your waist to try and touch the top of your toes.

Score:

- A** You can reach to within 2.5cm (1 in) or less of your toes.
- B** You can reach to within 2.5cm (1in) and 12.5cm (5in) of your toes.
- C** There is more than 12.5cm (5in) between your finger tips and toes.

The next two activities measure your MUSCULAR STRENGTH.

ACTIVITY 7: STANDING LONG JUMP

Stand still behind a mark and then lump forward as far as you can.

Score:

- A** Your jump is more than 15cm (6in) greater than your height.
- B** You jump between 15cm (6in) less and 15cm (6in) more than your height.
- C** Your jump is more than 15cm (6in) less than your height.

ACTIVITY 8: RAISING THE CHEST

Lie on your stomach and find some way of keeping your feet on the floor. Perhaps someone can hold them down for you or you can wedge them under the sofa or bed. Lace your fingers behind your head or keep your hands off the floor and raise your chin as high as possible. It does help if somebody else can measure how high you lift your chin, but if you are doing this on your own you may find it easier to lie with your head close to a wall so that you can quickly place your hand on the wall at the level of your chin.

Warning - Do not lift higher than 45cm (18in) or lift your shoulders up quickly.

Score:

- A** Your chin is over 38cm (15in) off the floor.
- B** Your chin is between 8cm (3in) and 38cm (15in) off the floor.
- C** Your chin is less than 8cm (3in) off the floor.

The next two activities measure your MUSCULAR ENDURANCE.

ACTIVITY 9: PUSH-UPS

Lie flat on the floor face down. Place your hands directly under your shoulders. Keep your legs and back as straight as possible and push upwards until your arms are also straight and your body has been lifted clear of the floor. Now lower yourself back down to your starting position. Do as many as you can up to a maximum of 25.

Score:

- A** You do 20 or more.
- B** You do between 6 and 19.
- C** You do 5 or less.

ACTIVITY 10: SIT-UPS

Lie on the floor with your knees bent and your hands interlaced behind your neck. Slowly curl up until your elbows touch your knees and then return to the starting position. Do as many as you can but no more than 30.

Warning - Do not do this activity with your legs out straight.
BEND YOUR KNEES.

Score:

- A** You do 20 or more.
- B** You do between 6 and 19.
- C** You do 5 or less.

The last two activities measure HEART AND LUNG STAMINA.

ACTIVITY 11: HOLDING YOUR BREATH

Breathe deeply two or three times and then hold your breath for as long as is comfortable. There is no need to hold your breath for longer than one minute.

Score:

- A** You can hold your breath for over 50 seconds.
- B** You can hold your breath for between 30 and 50 seconds.
- C** You cannot hold your breath for longer than 30 seconds.

ACTIVITY 12: A ONE MINUTE STEP TEST

For this activity you will need to take your pulse.

Advice — To do this, turn the palm of your hand towards the ceiling and lightly place the first 3 fingers of the other hand on the bare wrist just above the heel of the thumb.

Find a strong chair, stairs or firm box about 45cm (18in) high. Step up and down 30 times in 1 minute so you complete one step every 2 seconds. It may help to count ONE — TWO — THREE — FOUR, as you do it. At the end of 1 minute SIT DOWN and find your pulse straight away (within 10 seconds). Count the total number of beats you feel for the next 2 minutes.

Score:

- A** Less than 200 beats counted in 2 minutes.
- B** Between 200 and 240 beats counted in 2 minutes.
- C** More than 240 beats counted in 2 minutes.

You have now completed your **Fitness Awareness Profile**, and by looking at the ticks on your chart, you should have a picture of where you stand at the moment.

Advice - If you have ticked an 'A' or 'B' in all columns you should be fit enough to start refereeing and to train regularly to improve your fitness level still further.

Activities where you scored 'C' indicate an improvement is needed. As long as there are not too many in the 'C' category and you did not score 'C' for activities 11 or 12 there is no reason why you should not begin training with a view to officiating at your first match when your fitness profile has improved.

If you have scored mainly in the 'C' category, including a 'C' for activities 11 and 12, your fitness level is low and you should undertake exercise gradually, taking care not to do too much too soon. (See section on 'Improving and Maintaining Fitness'.)

Return to your **Fitness Awareness Profile** after a few weeks to see what improvements have been made.

PREPARING TO EXERCISE

THE IMPORTANCE OF WARMING UP

Warming your body up is an essential part of pre-match preparation and training as it prepares your body for action and **improves your performance**.

Thought - The first minute is as important as the ninetieth minute. Warming up will:

- Gradually increase your heart rate
- Increase the flexibility of your muscles, tendons and ligaments
- Improve speed
- Promote faster reactions
- Increase range of movement
- Reduce risk of injury

There are three phases to warming up.

1. GENERAL WARM UP

The warm up should begin with exercises involving your whole body, and should last for about 5—10 minutes, depending on the temperature. The aim of this phase is to:

- Raise the temperature of your body
- Raise the temperature of your muscles
- Increase the amount of blood flowing to your muscles

Start off with light jogging (e.g. 2 or 3 slow laps of the pitch) and include some skipping, backwards and sideways running and some arm circling to warm your upper body.

Tip - You should be sweating lightly at the end of this phase and your pulse rate should have risen to about 120 beats per minute before moving onto the next phase.

2. STRETCHING

You should stretch those parts of your body that will be used during your match or training session.

Advice - Hold each stretch for 10 seconds at the point of slight discomfort - relax - then repeat 2 or 3 times.

Warning - Never stretch cold muscles. DON'T BOUNCE.

Include the following stretches in your warm up.



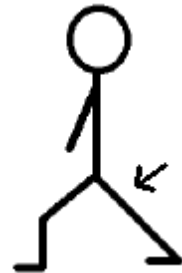
(i) ACHILLES STRETCH

Stand with one leg forward of the other, feet pointing forwards, back heel on the ground with the back leg slightly bent.

Keeping your back straight and your back heel on the ground
- sit back until you can feel a stretch low down near your Achilles tendon.

(ii) CALF STRETCH

Stand with one leg forward of the other - slightly more than in the previous exercise - feet pointing forwards, back heel on the ground and the back leg straight. Keeping your back straight and your back heel on the ground — bend your front knee and move your weight forward and down until you can feel the stretch on the back of your calf.



(iii) QUADRICEPS STRETCH (front of thigh)

Hold your foot with your hand and lift your foot up behind your buttock. Pull the foot back and away from the buttocks and push the knee towards the ground.

Use a wall or a partner if balance is a problem.

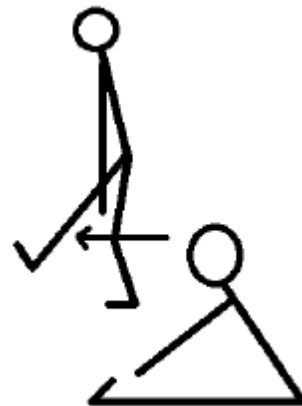
(iv) HAMSTRING STRETCH (back of thigh)

Stand with one leg forward of the other, feet pointing forwards. Push the hips back, bend your back leg slightly to support your weight, hands on supporting knee, then straighten your front leg. Increase the stretch by pushing your hips back and down.

For a further stretch pull your toes up.

Alternatively - you can sit down with your legs straight and grasp your toes and pull them towards you. Both these stretches are a far safer alternative to the touch your toes' stretch.

Warning - Stretches which involve dropping down to touch the toes are not recommended.





(v) GROIN STRETCH

Stand with your feet about 1 metre apart. Keeping your right leg straight, bend your left knee and lean your upper body towards the outstretched leg until you feel the stretch on the inside of your right thigh.

(vi) SIDE STRETCH

Stand with your feet wide apart and your hands down by your sides.

Lean to one side, reaching down with the hand to the knee.

For an extra stretch bring the other arm over the top of the head.

Warning - Do not bend forward or backward during this stretch and don't overstretch.



(vii) SHOULDER AND TRUNK STRETCH

Place your left hand on the back of the right shoulder and take the right arm back behind. Keep the hips facing forward and twist the shoulders and head around to the right, stretching the back of the left shoulder, the chest and front of the right shoulder, the trunk and the neck.

3. SPECIFIC WARM UP

In this phase, which should last for about 5 minutes, the aim is to get ready for the task ahead by performing exercises that are directly related to the effort to be made, be it a match, training, or taking a test.

You should include:

- Bursts of shorter, faster runs (i.e. Running at match speed)
- Twists and changes in direction
- Short sprints

Tip - At the end of a warm up you should feel warm rather than hot and be slightly out of breath.

If your warm up is in preparation for a match you should aim to complete warming up 10 -15 minutes prior to the start of the game. Return to the dressing room and keep warm. If you are warming up to train then off you go.

THEORY v REALITY

All this is fine for those of you refereeing in higher levels of football where there are facilities and the opportunity to warm up properly. But what about local football? What if you do not have a dressing room to return to, or if you do, it is a bus ride away?

Thought - Warming up is important at all levels.

The first minute is as important as the ninetieth in all games. Injuries can occur in any match.

Advice - Before putting on your boots, run on the spot for 2 - 3 minutes varying your pace every now and again.

Perform the stretching exercises.

Put your boots on, and run onto the centre of the field of play.

Run to one of the goals to check the nets and then run to the other end including changes in speed and direction as you go. Check the nets and run back to the centre circle.

THE IMPORTANCE OF THE WARM DOWN

The 'Warm Down' is very much neglected, but it is just as important as the 'Warm Up' and should be performed after every training session and match.

Fact — The 'Warm Down' is aimed at gradually returning the body to its resting state.

Advice - At the very least, on returning to the dressing room or on the completion of your training, you should repeat the stretching exercises performed as part of the warm up. This helps to prevent muscle stiffness and the onset of muscle soreness that can follow a particularly hard match or training session.

IMPROVING AND MAINTAINING FITNESS

Refereeing is basically an endurance activity, which means you must have the stamina (aerobic fitness) to be able to do the necessary running for 90 or perhaps 120 minutes. You also need to be quick in your movements and reactions so you can adjust according to the location of the players and the ball, and take decisions rapidly and decisively. External conditions such as the weather or poor state of the pitch can increase the demands made upon you.

Stamina can be improved in many ways, but the best activity to perform is **continuous steady running**. You can use a bike, a rowing machine or the swimming pool as an alternative to improve your fitness, and to add variety, but the majority of your training should be based upon running.

STARTING TO GET FIT

Use your Fitness Awareness Profile as a guide to how much training you should do to start with. If a few of your activities were in the 'C' category including activities 11 and 12, you should take care not to do too much too soon.

Tip - When you first go out for a run use time rather than distance as a target.

i.e. Run for 10 minutes rather than run round the block.

Also:

Run away from your starting point for 5 minutes - turn - and run back again. This means, if you are exhausted after 9 minutes you are nearly back home instead of 9 minutes away!

Gradually increase the time for your outward run until you can achieve 10 minutes in that direction. When starting to exercise follow these guidelines:

- Build up slowly until you can run continuously for 20 minutes.
- Run at a speed that increases your heart rate to between 70—90% of maximum. (See chart on page 48.)
- Check heart rate by taking the pulse rate for 15 seconds and then multiplying by 4. Adjust speed of running accordingly.
- Alternatively, perform the **conversation test** - you should be able to hold a short conversation with your training partner without becoming totally out of breath. If this is not possible, the exercise intensity should be decreased, even if this means walking for a while. Conversely, if conversation is too easy, the exercise intensity should be increased.

Aim for three sessions a week until you are ready to referee.

Remember - Even if you are just going for a short run the body still needs to be prepared. Complete the stretching exercises before you start running. Use the first few minutes of your run as a warm up by jogging slowly before increasing your pace. At the end of your run repeat the stretching exercises. This is particularly important if you have not trained for some time as it will help to prevent muscle stiffness.

When you can run continuously for 20 minutes you can now proceed to the next stage.

STANDARD FITNESS PROGRAMME

This programme is aimed at those of you who wish to maintain a level of fitness suitable for officiating in local football.

Training Sessions

- A** 5—10 minutes jogging to warm up
Stretching
30 minutes steady paced run at conversational pace
5—10 minutes jogging to warm down
Stretching
- B** 5-10 minutes jogging to warm up
Stretching
10 minutes fast paced running (you should be running at a pace where you cannot maintain a conversation and you should feel “puffed” at the end of this run)
5 -10 minutes jogging to warm down
Stretching

When you can comfortably run for 20 - 30 minutes you can begin to include some referee specific training together with some interval training, which is ideal for you as it mimics the demands of refereeing. Interval training stimulates the heart, lungs and muscles and builds up your endurance and recovery level of your body.

Examples of some interval training sessions are included below.

- C** 5—10 minutes jogging to warm up
Stretching
- Interval Training - Walk 50 metres (width of a football pitch)
- Jog 70 metres, sprint 10 metres, jog 20 metres.(length of a football pitch)
- Walk the width of the pitch
- Jog 70 metres, sprint 10 metres, jog 20 metres
- Repeat x 10 laps

5—10 minutes jogging to warm down
Stretching

- D** This session involves running 4 miles in total 5 minutes general body warm up
Stretching
Run the first half mile as a steady jog as a further warm up
The next 3 miles should be run slightly quicker and should include 10 bursts of mixed distances — 30 metres, 200 metres, 50 metres, 30 metres, 150 metres etc.
- sprinting the shorter distances and fast running the longer distances The last half mile acts as a slow jog warm down
Stretching
This session can be performed around a football pitch or park, over countryside or along the street using lamp posts as distance guides for the sprints and faster runs.
- E** This session needs to be performed around a 50 metre square (i.e. half a football pitch).
Jog 3 laps to warm up Stretching
Jog one 50 metre length - rest for 6 seconds
Run backwards for 20 metres, turn and sprint 10 metres, slow down to a walk during the next 20 metres
Jog 50 metres - rest for 6 seconds
Run backwards for 20 metres, turn and sprint 10 metres, slow down to a walk during the next 20 metres
Repeat for 10 laps Jog 3 laps to warm down Stretching

Advice - Aim for 3 sessions a week - refereeing a match would count as one session, but always try and include at least one training session even if you are refereeing more than one game during the week.

Tip - Vary your type of training by choosing a “running” based session on one occasion and an interval” type session on another.

INTERMEDIATE FITNESS PROGRAMME

This programme is aimed at all officials wishing to gain promotion and/or referee up to and including Supply League level.

Training Sessions

- A** 5 - 10 minutes jogging to warm up
Stretching
20 minutes fast paced running (you should be running at a pace where you cannot maintain a conversation and you should feel fatigued at the end of this run)
5 - 10 minutes to warm down
Stretching
- B** 5 -10 minutes jogging to warm up Stretching
30 minutes steady run at conversational pace, to include 10 bursts of short fast sprints over distances from 10 to 50 metres, and 5 bursts of fast running over distances from 150 - 250 metres
5 - 10 minutes jogging to warm down
Stretching
- C** 5 - 10 minutes jogging to warm up
Stretching
3 minutes hard running - but at a pace you can maintain for 3 minutes
3 minutes slow jogging
Repeat hard running and slow jogging 3 times but on the last time slow jog for 5 - 10 minutes to warm down
Stretching
- D** 5 - 10 minutes jogging to warm up
Stretching
60 seconds burst (80% max. speed) followed by 60 seconds jogging
30 seconds burst (90% max. speed) followed by 90 seconds jogging
10 seconds burst at full sprinting speed, followed by 50 seconds jogging
Repeat this sequence twice
10 minutes jogging
Stretching

- E** 5 - 10 minutes jogging to warm up
Stretching
Interval Training
- Run these distances as fast as you can
 - 50 metres (20 seconds rest)
 - 100 metres (30 seconds rest)
 - 150 metres (40 seconds rest)
 - 200 metres (60 seconds rest)
 - 150 metres (40 seconds rest)
 - 100 metres (30 seconds rest)
 - 50 metres (20 seconds rest)
 - 5 minutes slow jogging

Repeat sequence
Stretching

- F** 5 - 10 minutes jogging to warm up
Stretching
Sprinting
- 10 metres sprint, slow down to walk 10 metres,
 - 20 metres sprint, walk slowly back to your starting point
 - Repeat x 10
- 5 - 10 minutes jogging to warm down
Stretching

- G** Use session **E** from the **standard fitness programme** but repeat for 15 laps.

Advice - Aim for 3 sessions a week - refereeing a match would count as one session, but always try and include at least one training session even if you are refereeing more than one game during the week.

Tip - Vary your type of training by choosing a running" based session on one occasion and an "interval/sprint" type session on another.

ADVANCED FITNESS PROGRAMME

This programme is aimed at all referees officiating in senior football, from Contributory League level upwards.

Training Sessions

- A** 5 -10 minutes jogging to warm up
Stretching
30 minutes fast paced running (you should be running at a pace where you cannot maintain a conversation and you should feel fatigued at the end of this run)
5 -10 minutes to warm down
Stretching
- B** 5 - 10 minutes jogging to warm up
Stretching
30 - 40 minutes steady run at conversational pace, to include 12 bursts of short fast sprints over distances from 10 to 50 metres, and 6 bursts of fast running over distances from 150—250 metres
5 -10 minutes jogging to warm down
Stretching
- C** 5 -10 minutes jogging to warm up
Stretching
4 x 60 seconds running at a fairly fast pace with 200 metres jogging between each effort
3 minutes jogging
Repeat 4 x 60 seconds running
10 minutes jogging to warm down
Stretching
Note: the 60 seconds of running can include turns and changes in direction
- D** 5 -10 minutes jogging to warm up
Stretching
4 x 5 minutes fairly hard running with 3 minutes jogging between each run
10 minutes jogging to warm down
Stretching
Note: the 5 minutes of running can include turns and changes in direction

- E** 5 -10 minutes jogging to warm up
Stretching
Sprint Training - sprints at 70% -80% of maximum pace
- 10 seconds running
- 15 seconds rest/recovery
- Repeat x 6
- Restfor2 minutes
- Repeat procedure x 6 (36 sprints in total)
10 minutes jogging to warm down
Stretching

- F** 5 -10 minutes jogging to warm up
Stretching
Sprints - Maximum Pace - sprint 10 metres - walk back to start
- sprint 20 metres - walk back to start
- sprint 30 metres - walk back to start
- sprint 40 metres - walk back to start
- sprint 30 metres - walk back to start
- sprint 20 metres - walk back to start
- sprint 10 metres - walk back to start
- REPEAT WHOLE SEQUENCE
10 minutes jogging to warm down
Stretching

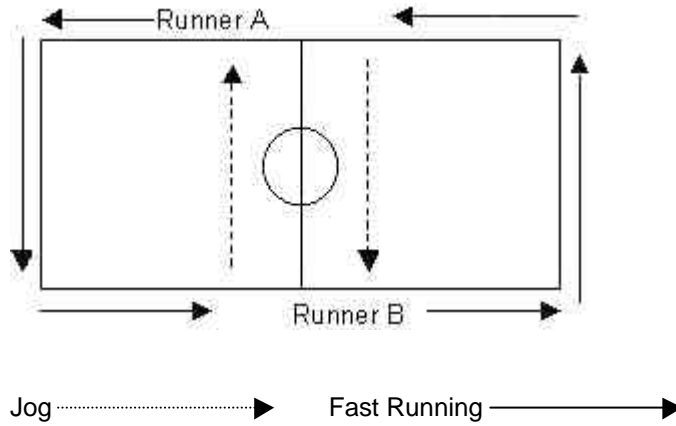
Advice - Aim for 3 sessions a week - refereeing a match would count as one session, but always try and include at least one training session even if you are refereeing more than one game during the week.

Tip - Vary your type of training by choosing a running” based session on one occasion and an “interval/sprint” type session on another.

ADDITIONAL INTERVAL RUNNING SESSIONS FOR ALL LEVELS

1 'HALF LAPS'

5 -10 minutes jogging to warm up
 Stretching
 Interval running



Standard:	Number of half laps	6
	Number of repeats	2
	Recovery between repeats	3 min (jogging)
Intermediate	Number of half laps	8
	Number of repeats	2
	Recovery between repeats	3 min (jogging)
Advanced:	Number of half laps	6
	Number of repeats	3
	Recovery between repeats	3 min (jogging)

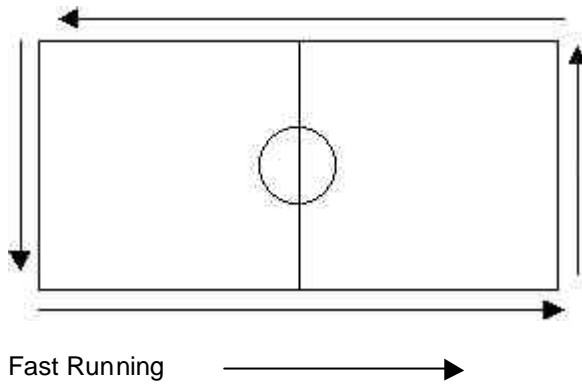
5—10 minutes jogging to warm down
 Stretching

2 'FULL LAPS'

5 -10 minutes jogging to warm up

Stretching

Interval running



Standard:	Number of Laps	4
	Recovery between laps	90 seconds
	Number of repeats	2
	Recovery between repeats	5 min (jogging)
Intermediate	Number of laps	5
	Recovery between laps	90 seconds
	Number of repeats	2
	Recovery between repeats	5 min (jogging)
Advanced:	Number of laps	4
	Recovery between laps	90 seconds
	Number of repeats	3
	Recovery between repeats	5 min (jogging)

5 – 10 minutes jogging to warm down

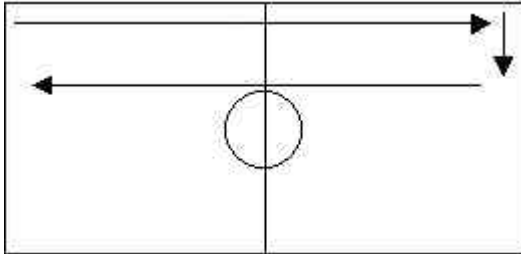
Stretching

3 'FULL LENGTH OF THE PITCH'

5 -10 minutes jogging to warm up

Stretching

Interval running



2 lengths of the pitch is equal to 1 lap.

Fast Running →

Standard:	Number of laps	5
	Recovery between laps	60 seconds
	Number of repeats	2
	Recovery between repeats	3 min (jogging)
Intermediate:	Number of laps	7
	Recovery between laps	60 seconds
	Number of repeats	2
	Recovery between repeats	3 min (jogging)
Advanced:	Number of laps	6
	Recovery between laps	60 seconds
	Number of repeats	3
	Recovery between repeats	3 min (jogging)

5 -10 minutes jogging to warm down

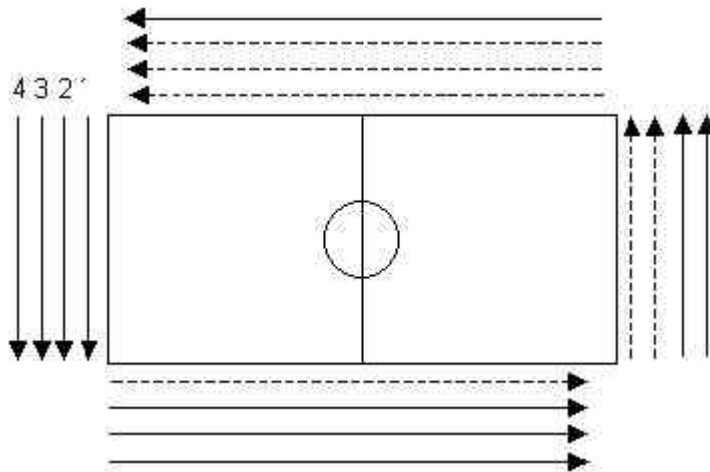
Stretching

4. INCREASED INTENSITY RUNNING

5 – 10 minutes jogging to warm up

Stretching

Interval running



Jog Recovery -----> Fast Running ----->

Lap 1: Fast running down one side of the pitch, jog the remaining three sides.

Lap 2: Fast running down two sides of the pitch, jog the remaining two sides.

Lap 3: Fast running down three sides of the pitch, jog the remaining side.

Lap 4: Full lap of fast running.

Standard:	Number of 4 laps	1
Intermediate:	Number of 4 laps	2
	Recovery between sets	3 min (jogging)
Advanced:	Number of 4 laps	3
	Recovery between sets	3 min (jogging)

5 -10 minutes jogging to warm down

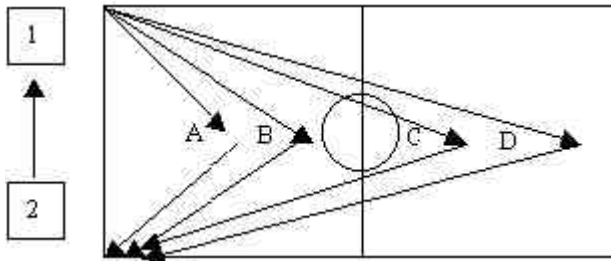
Stretching

5. INTERVAL CIRCUITS

5 – 10 minutes jogging to warm up

Stretching

Interval circuits



Jog Recovery Fast Running

Set out 6 cones as shown above.

Run from Cone 1, around A to Cone 2, jog recovery between 1 and 2.

Repeat between B, C and D.

Repeat the whole circuit again in reverse (i.e. D, C, B, A).

This constitutes 1 circuit.

Standard:	Number of circuits	1
Intermediate:	Number of circuits	2
	Recovery between circuits	5 min (jogging)
Advanced:	Number of circuits	3
	Recovery between circuits	5 min (jogging)

5 -10 minutes jogging to warm down

Stretching

STAYING FREE OF INJURY

Training must be thought of principally in terms of prevention of injury. **Fact** - Lack of fitness is one of the prime causes of injury.

The amount of time spent on training depends on the level at which you referee, and the state of your physical condition. If you begin pre-season training ten pounds overweight or in a 'flabby' condition, you will require a longer and more intensive programme than a colleague who is already in a reasonably good state of fitness.

Warning - The most dangerous period is the first few weeks of the season. Reasons for this include:

- Inadequate pre-season training
- Muscles are not as flexible as they should be
- Overweight
- Refereeing before you are fit enough

A referee is hardly ever injured by a player and any condition caused by direct contact would be sheer bad luck. You are most likely to suffer muscular injuries involving muscle pulls or ruptures. The muscles most likely to be affected are the muscles of the thigh and lower leg as well as the Achilles tendon.

Fact - Poor abdominal and back strength is a major cause of back injuries.

You need to work regularly (at least 3—4 times per week) on developing your abdominal and lower back strength and conditioning, and should include exercises for this purpose whenever you train, or on the floor at home on a non-training day.

There are lots of different exercises designed to strengthen the trunk muscles. Here are a few of the more common exercises.

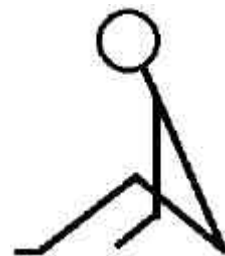
Advice - Try and perform at least 12 repetitions of each exercise. As you become stronger perform up to 25 repetitions and repeat up to 3 times.

Breathe freely throughout each repetition.

BUILD UP THE WORKLOAD SLOWLY.

(i) TRUNK CURLS

Lie on your back with your knees bent to 90 degrees and feet flat on the floor (not held). Slowly curl the shoulders off the ground and then sit up, directing your elbows towards the hips. Pause at the top position and squeeze the abdominals. Slowly return the shoulders to the floor after each sit-up.





(ii) SIT-UPS WITH A TWIST

Lie on your back with your knees bent to 90 degrees and feet flat on the floor. Place your hands behind your head and sit up to touch your right elbow to your left knee and vice versa.

(iii) BACK EXTENSIONS

Lying on your front, hands linked behind your back. Raise your trunk off the ground, to arch your back whilst keeping your hips on the floor. Hold for the count of 10. Return to the starting position.



(iv) 'SUPERHEROES'

Lying face down, raise your left arm and your right leg at the same time. Pause at the top and then lower under control. Repeat with the opposite side.

Regular stretching and strengthening of your muscles will help prevent those niggling injuries that so often detract from your performance, psychologically and physically.

TRAINING GUIDELINES

Follow these simple **Training Guidelines** to improve your fitness and remain free from injury.

1. Don't work too hard too soon. Improvements in fitness take time. If you rush your progression you may injure yourself. The primary objective is that you stay injury free, so don't overtrain.
2. Try to vary your training so you alternate hard and easy days.
3. All sessions should start and finish with a warm up/down followed by stretching.
4. Always train within your training zone (i.e. 70% - 90% of maximum heart rate).
5. Do not train if you are ill.
6. If you are injured try and substitute training for activities such as cycling or swimming to help you maintain your fitness.
7. Invest in decent clothing and footwear. It is important to wear good shoes especially when training on hard surfaces.
8. Don't jog in fog!
9. If you go jogging in the dark always wear light coloured clothing so you can be seen easily. Better still, wear a reflective jacket.
10. Don't eat, drink caffeine or use tobacco products within 2 hours of a game or training session.
11. Regularly consume water before, during and after training and matches.

MONITORING YOUR FITNESS

How do you know when you are fit?

How do you know if you are becoming fitter as a result of your training programme?

How do you know if you are fit enough to referee at a particular level?

Every now and again it is important to monitor your fitness level, be it for your own evaluation or part of a required test to enable you to referee at a particular level. Fitness Tests fall into two main categories - specific or general.

SPECIFIC: These tests measure a person's ability to perform a particular activity or skill, e.g. weightlifting, rowing or motor racing.

GENERAL: These tests measure how well a person's body responds to physical effort and provides a measure of performance capability.

As refereeing is an endurance activity and involves mainly running it falls into the general category. Tests of a general nature would be, for example:

- *Time* taken to run a given distance (e.g. 10m, 50m, 200m, 3000m)
- *Distance* covered in a given time (e.g. the 12 minute run as part of the Cooper Test)

Football authorities throughout the world monitor the fitness level of their referees by means of a general fitness test, although at the higher levels these are supplemented by additional medical information (e.g. Blood Pressure, Body Fat Percentage, Lactic Acid Accumulation, Haemoglobin level, Cholesterol level, Eyesight, etc.)

CURRENT FITNESS TESTS IN OPERATION IN ENGLAND

1 *FIFA, National List, Panel League and Contributory League Referees*

Their general fitness test includes:

- 2 runs of 50 metres in 7.5 seconds - to measure speed off the mark.
- A minimum of 2700 metres in 12 minutes - to measure stamina.
- Speed and agility sprints (FIFA and National List Officials only).

2 *Contributory Assistant Referees (Level 4)*

The general fitness test includes:

- 2 runs of 50 metres in 7.5 seconds - to measure speed off the mark.
- A minimum of 2500 metres in 12 minutes - to measure stamina.

3 *Local League Officials*

No standardised fitness test exists for referees at this level, but it is suggested that all officials should be able to complete 2200 metres in 12 minutes. Before starting to referee, complete your Fitness Awareness Profile and be able to run 1800 metres in 12 minutes.

MONITORING YOUR FITNESS v PASSING A TEST

To proceed to referee at a higher level you are required to “pass” a fitness test. By gaining a “pass” you have achieved the **minimum** level of fitness required for that specific level of refereeing. Unless you have run as fast as you can throughout the test the result does not reflect your actual level of fitness. The aim of every referee should be not to just “pass” the test but to perform maximally so your **optimum** level of fitness can be measured.

KEEPING A TRAINING DIARY

The purpose of a training diary is to keep a record of all the training, technical sessions and other related activities you do each week. In this way you will be able to see how your training is progressing in relation to your performance and fitness test results. This will also help your Fitness Training Leader assess your progress. Be honest in your assessment as the training diary forms the basis of training modifications. An example of a daily training diary can be found on page 52.

FITNESS AWARDS

Would you like to be known as the fittest referee in England, or your County, or your League? The Football Association is awarding Certificates of Achievement to those referees who not only pass their fitness test but achieve a standard higher than the one needed to pass.

The award is open to all referees and involves completing a 12 minute run. The distance covered is then converted to a points score. The 12-minute run must be undertaken as part of a supervised fitness test by a competition or a County FA, or organised by your Area Fitness Co-ordinator or an approved Fitness Training Leader. A points score of 69 (2500m) is the minimum required to receive a Pass Certificate'. By increasing your score to 79 (2900m) you can receive the 'Bronze Award' and further improvement to 85 (3100m) and 91 (3300m) will gain you the 'Silver Award' and the coveted 'Gold Award' respectively. At the end of each season the referee with the highest score will receive the Football Association's 'Fittest Referee Award'. A chart converting distance into points is shown on page 47.

FOOD AND THE REFEREE

EATING SENSIBLY - General Advice for all Referees

As well as training regularly your everyday choice of food is going to be a key factor in maintaining your target weight, and/or reducing the percentage of body fat.

Thought - It is estimated you consume 5 to 8 times your body weight in food in any one year - that is an average of over 450kg (1000lb) of food, not counting the weight of what you drink.

Usually your body is very efficient and is able to sort through all this mixture and extract what is needed to keep you functioning. It is not just the quantity of food that is important but the right balance.

Fact - You need **nutrients**, which are the basic raw materials required to build and repair the body. These would include proteins, fats, carbohydrates, vitamins, minerals and water.

Fact - You need **energy** to fuel the body.

Fact - You need **fibre**, found in natural plant substances, to aid the passage of the food through your body.

If you are eating nearly half a ton of food each year, it is just about impossible to go short of the basic nutrients. On average you eat about twice as much protein as you actually need, and if you are eating a varied diet with plenty of fresh fruit and vegetables, cereals and some fish, eggs, meat and dairy products, you should also be getting sufficient vitamins and minerals.

Advice - Unless there is a particular medical reason for you to do so, your body does not need vitamin and mineral supplements as an extra.

As a result of all the meat, dairy products and refined foods being eaten today, the one real shortage area is likely to be that of **dietary fibre (roughage)**. This is part of the food we eat that is not digested and as it passes through the body, it absorbs and retains water, making the waste materials easier to move. Fibre is found in bread (especially wholemeal), cereals, potatoes, peas, beans, lentils, leafy vegetables and fruit — all plant foods - and not in food that comes from animals.

Advice - Where you know you eat plenty of refined foods, you should consider doubling the amount of fibre in your diet.

For those of you carrying a few extra pounds, you probably have too much fat in your diet and would benefit by reducing your fat intake by at least a quarter. This may seem like a major change in your eating habits, but it is not as difficult to achieve as it sounds.

Tips - Follow these simple suggestions and your fat intake will be reduced substantially.

- Try fish or vegetable dishes instead of meat
- When you do have meat try and choose the leaner cut or cut off the fatty bits
- Eat chicken, which has less fat than other meats
- Have fewer fry-ups, consider grilling food instead
- Cut down on chocolate
- Cut down on fatty cheeses
- Use low-fat spreads and dairy products and spread butter or margarine more thinly
- Try semi-skimmed or skimmed milk

If losing weight is a priority it is quite safe to cut down on sugar. Sugar has no nutritional value other than its energy content.

Fact - The average person in Britain eats about 100 pounds of sugar per year.

Thought - That amount would provide you with enough energy to walk from Manchester to Barcelona. . . AND BACK!

The message is clear. Far too much sugar is being eaten. The trouble is, sugar is a standard ingredient in a huge variety of foods and in alcoholic drinks. Apart from the obvious foods like sweets, jam, marmalade, cakes, biscuits and pastries, it can also be found in the syrups of tinned fruits, in savoury sauces and in many sweetened drinks.

Tips - It is surprisingly easy to adjust to eating less sugar.

- Take less sugar in your tea or coffee. Gradually reduce the number of spoonfuls to help you get used to the difference in taste.
- Choose diet or slimline drinks
- Spread jam and marmalade more thinly
- Cut down on sweets and chocolate
- Eat fewer biscuits
- Eat smaller portions of cake
- Read what the labels say on food packets

Eating sensibly will be of benefit to all referees and will go a long way towards helping you achieve the right weight for your height. Being the right weight is the singular most important fitness factor for referees operating within local football. That is why the first five activities of your Fitness Awareness Profile concentrate on your weight and fat content.

Advice - Revisit Activities 1—5 of your Fitness Awareness Profile regularly.

FUELLING UP

The onset of fatigue coincides with a decrease in the quality of your performance. However, fatigue can be delayed or reduced by correct nutrition. In fact, eating the right foods really can make the difference between being in the 'right place at the right time' or not. The amount of energy you will need to referee will vary according to your age, body weight (there it is again), how hard you work and at which level you are refereeing.

Advice - FIFA recommends that you should obtain 60—70% of your total energy intake from carbohydrates, 20—25% from fat, and approximately 15% from protein.

Fact - When you eat any food containing carbohydrate, much of the carbohydrate is converted by your body into glycogen, which is stored in your liver and muscles. When you train or referee you need a lot of energy quickly and the glycogen acts as the fuel to your muscles. However, your stores of muscle glycogen are quite limited and only sufficient for around 90 minutes of activity. Once the glycogen stores are depleted, fatigue occurs quickly.

Tip - To delay the point of fatigue it is important to start any training session or match with your fuel stores full of glycogen. This is achieved by eating plenty of foods containing a lot of carbohydrate.

Good Sources of Carbohydrate

Bread	Cereals	Pasta
Rice	Potatoes	Pizza
Beans	Dried Fruit	Fruit
Fruit Juice	Sports Drinks	Milk

Advice - For your main meal on the day prior to a match eat a meal based on the foods above.

Tip - Up to 1 hour prior to a training session or a match top up your fuel supplies with a 'Carbohydrate Snack'. These include:

Biscuits	Sweets	Chocolate Bar
Bananas	Crackers	Cake
Toast with Jam	Sandwiches	Sports Drink

Immediately following a training session or a match you need to start refuelling with carbohydrates as soon as possible. It is vital not to wait too long before refuelling, as your rate of recovery will be quicker if you can refuel during the first few hours after training or a match.

Fact - Muscles take up glycogen most rapidly within 2 hours after exercise, and especially within the first hour.

Advice - Eat a 'Carbohydrate Snack' as soon as you can following training or a match, e.g. chocolate bar, banana, sandwiches, biscuits, etc. Eat a carbohydrate-based meal within 2 hours of the game or training session.

Tip - Arrange to eat your main meal of the day after training or a game.

TAKING IN FLUID

During training and in matches you will lose fluids, up to 1–2 litres per hour in sweat. Dehydration will occur and will result in poor physical performance. Even small fluid losses from the body can impair the accuracy and skill of your performance, whilst larger losses can affect temperature control, the cardiovascular system and become life threatening as shown in the following table

Loss of up to 1 litre	100% performance, but you will begin to feel thirsty.
Loss of 1.5 litres	100% performance, but maximum effort required.
Loss of 2 litres	5% drop in performance. You feel very tired.
Loss of 2.5 litres	10% drop in performance, occasional stops needed.
Loss of 3 litres	15% drop in performance, more frequent stops, nearing exhaustion.
Loss of 3.5 litres	20% drop in performance, loss of motor co-ordination.
Loss of 6 litres	Performance collapses, urine production down 50%, disorientated, co-ordination problems, sluggish.
Loss of 9 litres	Loss of consciousness, life in danger, could be fatal.

Remember -Thirst is a poor indicator of hydration. If you only drink when you feel thirsty, it is already too late as thirst is the emergency signal that your body is already dehydrated. Tip- Little and often' is the key to fluid intake.

Advice - Take plenty of fluids on the day of the game and between 20—30 minutes prior to a match (or training), drink about a half litre of cool water or a sports drink.

During training try to stay well hydrated. Choose drinks that are cool and palatable and take in fluid about every 15 minutes throughout the session — more frequently if it is hot.

Tip - During a match, always have a drink at half-time whether you feel thirsty or not. At the end of a training session or a match drink plenty of fluid - at least 1 litre.

Warning - Alcohol should be avoided during the first two hours after a training session or a match because it is a diuretic which causes water loss. Alcohol should only be consumed once the weight lost from sweating has been replaced. The passing of clear urine is a simple indicator of when rehydration has occurred.

CLIMBING THE PYRAMID

Progress in any sport invariably means participants having to pay attention to the smallest detail if they wish to improve and compete with the best. Improving as a referee and officiating at higher levels brings with it certain expectations of the officials and any advantage the referee can gain must be to his/her benefit. Every avenue must be explored and 'fine tuning' your diet may just give you that extra edge.

The 'basics' already outlined are the same for all referees, but progress brings higher physical demands and the need to maximise your energy output. Ensuring your glycogen supplies are fully topped up prior to entering the field of play may make the difference between completing the game with energy to spare or fading badly in the last 15 minutes with serious consequences.

Although you should be conscious of your diet every day, particular attention should be paid to what you eat on the day prior to a match and on match day.

THE DAY BEFORE THE MATCH

- Eat a high carbohydrate **breakfast**, e.g. 1 bowl of cereal, 3—4 pieces of toast (with jam, marmalade or honey if you wish), and 1 glass of fruit juice.
- It is important to **drink** more throughout the day (fruit juices, sports drinks, etc.).
- Eat 2—3 '**Carbohydrate Snacks**' during the day.
- For your **main meal** (evening) - eat a meal based around high carbohydrate foods.

MATCH DAY

- Eat a high carbohydrate **breakfast** as on the previous day.
- For your **Pre-Match Meal** eat a carbohydrate meal (approximately 100g of carbohydrate) 3—4 hours before kick-off. (See Table 1 — Food Portions Containing 50g of Carbohydrate.)
- Continue eating '**Carbohydrate Snacks**' up to 1 hour before the game.

- **Drink** at least 3 litres of fluids throughout the morning/early afternoon before the match.
- **Drink** approximately 0.5 litre of fluid 30 minutes before the match.

WHAT TO DRINK DURING THE MATCH

- **Drink** approximately 0.5 litre of fluid (sports drink) at half-time.
- Take on **fluids** whenever possible during stoppages in the match.

WHAT TO EAT/DRINK AFTER THE MATCH

- Drink at least 1 litre of fluid immediately after the match.
- Make sure you take at least 100g of carbohydrate during the first two hours after the game. This can be easily done with a combination of fluids and foods that are rich in carbohydrate.
- Do not drink any alcohol during the first two hours after a match.

Examples of Food Portions Containing 50g of Carbohydrate

Breakfast Cereals	1 large bowl	Pasta (cooked)	2 mugs
****		Rice (cooked)	1 mug
Boiled Potatoes	5 egg size	Tinned Spaghetti	
Jacket Potato	1 medium with skin	or Ravioli	1 standard can
		Baked Beans	3/4 standard can
Mashed Potato	5 scoops	****	
Chips	3/4 shop portion	Bread	4 slices
****		Rolls	2
Bananas	2 large	Currant Buns	2 soft/crusty
Apples	4 medium	Tea Cakes	2
Oranges	4 medium	Fruit Scones	2
Tinned Fruit in		Jam Tarts	3
Juice	1 standard can	Digestive Biscuits	5
****		Ginger Nuts	7
Chocolate Bar	1 1/2 50g bars	Jaffa Cakes	6
Kit Kat	8 fingers	Crackers	10
Mars Bar	1 standard bar	****	
Snickers	1 1/2 standard bars	Milk	2 pints
Liquorice Allsorts	1 medium bag	Fruit Juice	1 pint
Fruit Pastilles	2 tubes	Isotonic Drink	2 cans
****		Ribena (diluted)	2 glasses
Pizza	1/2 9" base	Lemonade	2 1/2 cans

FITNESS AWARENESS PROFILE

Record your actual scores in the first box and tick the category A, B or C appropriate to your score.

ITEM	SCORE	A	B	C
Activity 1: Body Weight				
Activity 2: Chest/Waist difference				
Activity 3: Body Fat %				
Activity 4: Target Weight				
Activity 5: Body-Mass-Index				
Activity 6: Toe Touch				
Activity 7: Standing Long Jump				
Activity 8: Raising The Chest				
Activity 9: Push-ups				
Activity 10: Sit-ups				
Activity 11: Breath Holding				
Activity 12: Step Test				

Hopefully, all of your ticks will appear in the A or B columns, but if any appear in the C column that indicates where an improvement is required.

HEART RATE AS A GUIDE TO WORK RATE

Age	Max. Heart Rate Per Minute	70% Max.	90% Max.
20	200	140	180
21	199	139	179
22	198	139	178
23	197	138	177
24	196	137	176
25	195	136	175
26	194	136	175
27	193	135	174
28	192	134	173
29	191	134	172
30	190	133	171
31	189	132	170
32	188	132	169
33	187	131	168
34	186	130	167
35	185	129	166
36	184	129	166
37	183	128	165
38	182	127	164
39.	181	127	163
40	180	126	162
41	179	125	161
42	178	124	160
43	177	124	159
44	176	123	158
45	175	122	157
46	174	122	157
47	173	121	156
48	172	120	155
49	171	120	155
50	170	120	155
51 -59	165	115	150
60+	160	110	145

CONVERT DISTANCE INTO POINTS

Run for a maximum of 12 minutes and convert the distance covered into points.

For Assistant Referees officiating at Contributory League, the minimum standard is 69 (2500m) points. For Referees officiating at Contributory League level and above, the minimum standard is 75 (2700m) points.

91+	Gold
85 - 90	Silver
79 - 84	Bronze
69 - 78	Pass
60 - 65	Referees officiating in local football only

Pts	Dist	Laps	Pts	Dist	Laps	Pts	Dist	Laps
100	3600	9.0	71	2570		42	1535	
99	3570		70	2535		41	1500	3.75
98	3535		69	2500	6.25	40	1470	
97	3500	8.75	68	2470		39	1435	
96	3470		67	2435		38	1400	3.5
95	3435		66	2400	6.0	37	1370	
94	3400	8.5	65	2370		36	1335	
93	3370		64	2335		35	1300	3.25
92	3335		63	2300	5.75	34	1270	
91	3300	8.25	62	2270		33	1235	
90	3270		61	2235		32	1200	3.0
89	3235		60	2200	5.5	31	1170	
88	3200	8.0	59	2170		30	1135	
87	3170		58	2135		29	1100	2.75
86	3135		57	2100	5.25	28	1070	
85	3100	7.75	56	2070		27	1035	
84	3070		55	2035		26	1000	2.5
83	3035		54	2000	5.0	25	970	
82	3000	7.5	53	1950		24	935	
81	2970		52	1900	4.75	23	900	2.25
80	2935		51	1850		22	870	
79	2900	7.25	50	1800	4.5	21	835	
78	2850		49	1770		20	800	2.0
77	2800	7.0	48	1735				
76	2750		47	1700	4.25			
75	2700	6.75	46	1670				
74	2670		45	1635				
73	2635		44	1600	4.0			
72	2600	6.5	43	1570				

A referee at any classification can undertake the awards.

It is not recommended that a person commences refereeing until they have scored at least 50 points.

HEIGHT/WEIGHT CHART

HEIGHT cm Feet/in	DESIRABLE kg WEIGHT stones/lb	OVERWEIGHT kg stones/lb	FAT kg stones/lb
142.5 4'8"	42.0 - 54.0 6st 8lb - 8st 8lb	55.0 - 63.5 8st 9lb - 10st 0lb	64.0+ 10st 1lb+
145 4'9"	43.0 - 55.0 6st 11lb - 8st 9lb	55.5 - 65.0 8st 10lb - 10st 3lb	65.5+ 10st 4lb+
147.5 4'10"	44.0 - 56.0 7st 0lb - 8st 11lb	56.5 - 66.0 8st 12lb - 10st 6lb	67.0+ 10st 7lb+
150 4'11"	47.0 - 57.0 7st 5lb - 9st 0lb	58.0 - 68.0 9st 1lb - 10st 10lb	69.0+ 10st 11lb+
152.5 5'0"	48.0 - 59.0 7st 7lb - 9st 4lb	60.0 - 70.0 9st 5lb - 11st 0lb	70.5+ 11st 1lb+
155 5'1"	49.0 - 61.0 7st 10lb - 9st 8lb	62.0 - 71.5 9st 9lb - 11st 4lb	72.0+ 11st 5lb+
157.5 5'2"	50.0 - 63.0 7st 12lb - 9st 12lb	63.5 - 73.5 9st 13lb - 11st 8lb	74.0+ 11st 9lb+
160 5'3"	51.0 - 63.5 8st 0lb - 10st 0lb	64.0 - 75.5 10st 1lb - 11st 12lb	76.0+ 11st 13lb+
162.5 5'4"	53.0 - 64.5 8st 4lb - 10st 2lb	65.0 - 78.0 10st 3lb - 12st 4lb	78.5+ 12st 5lb+
165 5'5"	53.5 - 66.0 8st 6lb - 10st 6lb	66.5 - 80.0 10st 7lb - 12st 8lb	80.5+ 12st 9lb+
167.5 5'6"	54.0 - 68.0 8st 8lb - 10st 10lb	68.5 - 82.0 10st 11lb - 12st 12lb	82.5+ 12st 13lb+
170 5'7"	56.0 - 70.5 8st 11lb - 11st 1lb	71.0 - 84.5 11st 2lb - 13st 4lb	85.0+ 13st 5lb+
172.5 5'8"	57.0 - 73.0 9st 0lb - 11st 6lb	73.5 - 87.0 11st 7lb - 13st 10lb	87.5+ 13st 11lb+
175 5'9"	59.0 - 74.0 9st 4lb - 11st 9lb	74.5 - 89.0 11st 10lb - 14st 0lb	89.5+ 14st 1lb+
178 5'10"	61.0 - 76.0 9st 8lb - 12st 0lb	76.5 - 92.0 12st 1lb - 14st 6lb	92.5+ 14st 7lb+
180.5 5'11"	63.0 - 79.5 9st 12lb - 12st 7lb	80.0 - 95.5 12st 8lb - 15st 0lb	96.0+ 15st 1lb+
183 6'0"	64.5 - 81.0 10st 2lb - 12st 11lb	82.0 - 97.5 12st 12lb - 15st 5lb	98.0+ 15st 6lb+
185.5 6'1"	67.0 - 83.5 10st 8lb - 13st 2lb	84.0 - 100.0 13st 2lb - 15st 10lb	100.5+ 15st 11lb+
188 6'2"	69.0 - 86.0 10st 12lb - 13st 8lb	86.5 - 102.5 13st 9lb - 16st 2lb	103.0+ 16st 3lb+
190.5 6'3"	71.0 - 88.5 11st 2lb - 13st 13lb	89.0 - 106.0 14st 0lb - 16st 10lb	107.0+ 16st 11lb+
193.5 6'4"	73.0 - 91.0 11st 6lb - 14st 4lb	91.5 - 109.0 14st 5lb - 17st 2lb	109.5+ 17st 3lb+

BODY FAT PERCENTAGE CHART FOR MEN

		Nec k													
	cm	33.0	34.5	35.5	37.0	36.0	39.5	40.5	42.0	43.0	44.5	45.5	47.0	48.0	49.5
	in	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5
Abdomen cm	men in														
64	25	6.5	4.5	3.0	1.5										
66	26	8.0	6.5	5.0	3.5	2.0									
69	27	10.0	8.5	7.0	5.5	4.0	2.0	0.5							
71	28	12.0	10.5	8.5	7.0	5.5	4.0	2.5	1.0						
74	29	14.0	12.0	10.5	9.0	7.5	6.0	4.5	2.5	1.0					
76	30	15.5	14.0	12.5	11.0	9.5	7.5	6.0	4.5	3.0	1.5				
79	31	17.5	16.0	14.5	13.0	11.0	9.5	8.0	6.5	5.0	3.5	1.5			
81	32	19.5	18.0	16.5	14.5	13.0	11.0	10.0	8.5	6.5	5.0	3.5	2.0	0.5	
84	33	21.5	19.5	18.0	16.5	15.0	13.5	12.0	10.0	8.5	7.0	5.5	4.0	2.5	0.5
86	34	23.0	21.5	20.0	18.5	17.0	15.5	13.5	12.0	10.5	9.0	7.5	5.5	4.0	2.5
89	35	25.0	23.5	22.0	20.5	18.5	17.0	15.5	14.0	12.5	11.0	9.0	7.5	6.0	4.5
91	36	27.0	25.5	24.0	22.5	20.5	19.0	17.5	16.0	14.5	12.5	11.0	9.5	6.0	6.5
94	37	28.0	27.0	25.5	24.0	22.5	21.0	19.5	17.5	16.0	14.5	13.0	11.5	10.0	8.0
96	38	30.5	29.0	27.5	26.0	24.5	23.0	21.0	19.5	18.0	16.5	15.0	13.5	11.5	10.0
99	39	32.5	31.0	29.5	28.0	26.0	24.5	23.0	21.5	20.0	18.5	16.5	15.0	13.5	12.0
102	40	34.5	33.0	31.5	29.5	28.0	26.5	25.0	23.5	22.0	20.0	18.5	17.0	15.5	14.0
104	41	36.5	35.0	33.0	31.5	30.0	28.5	27.0	25.0	23.5	22.0	20.5	19.0	17.5	15.5
106	42	38.0	36.5	35.0	33.5	32.0	30.5	28.5	27.0	25.5	24.0	22.5	21.0	19.0	17.5
109	43	40.0	38.5	37.0	35.5	34.0	32.0	30.5	29.0	27.5	26.0	24.0	22.5	21.0	19.5
112	44	42.0	40.5	39.0	37.0	35.5	34.0	32.5	31.0	29.0	27.5	26.0	24.5	23.0	21.5
114	45	44.0	42.5	40.5	39.0	37.5	36.0	34.5	33.0	31.0	29.5	28.0	26.6	25.0	23.0
117	46	45.5	44.0	42.5	41.0	39.5	38.0	36.0	34.5	33.0	31.5	30.0	28.5	26.5	25.0
119	47	47.5	46.0	44.5	43.0	41.5	39.5	38.0	36.5	35.0	33.5	32.0	30.0	28.5	27.0
122	48	49.5	48.0	46.5	44.5	43.0	41.5	40.0	38.5	37.0	35.0	33.5	32.0	30.5	29.0
124	49	51.5	50.0	48.0	46.5	45.0	43.5	42.0	40.5	38.5	37.0	35.5	34.0	32.5	31.0
127	50	53.5	51.5	50.0	48.5	47.0	45.5	43.5	42.0	40.5	39.0	37.5	36.0	34.0	32.5

BODY FAT PERCENTAGE CHART FOR WOMEN

Points	Neck		Abdomen		Arm		Forearm		Thigh	
	cm	in	cm	in	cm	in	cm	in	cm	in
0.5	39.5	15.5			15.0	6.0				
1			48.0	19.0			44.5	17.5	30.5	12.0
1.5	38.0	15.0	49.5	19.5					32.0	12.5
2			51.0	20.0	16.5	6.5			33.0	13.0
2.5	37.0	14.5	52.0	20.5			43.0	17.0	34.5	13.5
3			53.5	21.0	18.0	7.0				
3.5			55.5	22.0					35.5	14.0
4	35.5	14.0	57.5	22.5					37.0	14.5
4.5			58.5	23.0	19.0	7.5	42.0	16.5		
5	34.5	13.5	59.5	23.5					38.0	15.0
5.5			61.0	24.0					39.5	15.5
6	33.0	13.0	63.5	25.0	20.5	8.0				
6.5			64.5	25.5			40.5	16.0	40.5	16.0
7	32.0	12.5	66.0	26.0	21.5	8.5			42.0	16.5
7.5			67.5	26.5						
8	30.5	12.0	68.5	27.0			39.5	15.5	43.0	17.0
8.5			71.0	28.0	23.0	9.0				
9			72.5	28.5					44.5	17.5
9.5	29.0	11.5	73.5	29.0					45.5	18.0
10			75.5	30.0	24.0	9.5	38.0	15.0	47.0	18.5
10.5	28.0	11.0	77.5	30.5						
11			79.0	31.0	25.5	10.0			48.0	19.0
11.5	26.5	10.5	80.0	31.5						
12			81.0	32.0			37.0	14.5	49.5	19.5
12.5	25.5	10.0	83.5	33.0	26.5	10.5			51.0	20.0
13			85.0	33.5						
13.5			86.5	34.0					52.0	20.5
14	24.0	9.5	87.5	34.5	28.0	11.0	35.5	14.0	53.5	21.0
14.5			89.0	35.0						
15	23.0	9.0	91.5	36.0	29.0	11.5			54.5	21.5
15.5			93.0	36.5					56.0	22.0
16	21.5	8.5	94.0	37.0			34.5	13.5		
16.5			95.0	37.5	30.5	12.0			57.0	22.5
17	20.5	8.0	96.5	38.0					58.5	23.0
17.5			98.5	39.0						
18	19.0	7.5	100.5	39.5	32.0	12.5	33.0	13.0	59.5	23.5
18.5			101.5	40.0					61.0	24.0
19			103.5	41.0	33.0	13.0				
19.5			105.5	41.5					62.0	24.5
20			106.5	42.0			32.0	12.5	63.5	25.0

cont'd...

BODY FAT PERCENTAGE CHART FOR WOMEN

Points	Neck		Abdomen		Arm		Forearm		Thigh	
	cm	in	cm	in	cm	in	cm	in	cm	in
20.5			108.0	42.5	34.5	13.5				
21			109.0	43.0					64.5	25.5
21.5			110.5	43.5					66.0	26.0
22			112.0	44.0			30.5	12.0		
22.5			114.0	45.0					67.5	26.5
23			115.5	45.5					68.5	27.0
23.5			117.0	46.0						
24			119.5	47.0			29.0	11.5	70.0	27.5
24.5			120.5	47.5					71.0	28.0
25			122.0	48.0						
25.5			123.0	48.5			28.0	11.0	72.5	28.5
26			124.5	49.0					73.5	29.0
26.5										
27									75.0	29.5
27.5							26.5	10.5	76.0	30.0
28										
28.5									77.5	30.5
29									79.0	31.0
29.5							25.5	10.0		
30									80.0	31.5
30.5										
31									81.0	32.0
31.5							24.0	9.5	82.5	32.5
32									84.0	33.0
32.5										
33									85.0	33.5
33.5							23.0	9.0		
34										
34.5										
35										
35.5							21.5	8.5		
36										
36.5										
37							20.5	8.0		
37.5										
38										
38.5										
39							19.0	7.5		
39.5										
40										

Measure the circumference of your neck, abdomen, biceps, forearm and thigh, in cm. Find the points covered for **each** of your 5 circumferences. Add them **all** together. Subtract 55 from the total. The figure you are left with is the predicted percentage of body fat you are carrying.

EXAMPLE OF A DAILY TRAINING DIARY

Date: 05.03.01

Training:

Evening: Warm up and stretch (10 mins)
Interval Circuits - Intermediate level
Abdominal work out
Warm down and stretch

Comments:

Felt good. Will try the Advanced level next time.

Date:

Training:

Comments: