Police Recruitment Fitness Programme

Before starting on a programme of physical activity is essential that you:

Contact your Doctor to ensure that you are of adequate health to proceed with a programme of moderate to vigorous exercise. Understand all advice and information supplied to you. If at all unsure about any aspect of the programme you must contact a certified fitness professional.

The two assessable elements of the fitness test are:

Cardiovascular fitness – the ability of the heart and lungs to provide sufficient oxygen to the working muscles to sustain a rhythmical activity involving large muscle groups (running, cycling, swimming) for an extended period of time (generally >15 minutes)

Muscular strength – the ability of the neuromuscular system to exert force (this could be against a moveable or immovable object).

Other elements of fitness exist, such as flexibility, speed and muscular endurance and all have importance to achieving overall conditioning. The two identified assessable areas of the fitness test have been selected as they display particular job relevance. Furthermore, from a health perspective, cardiovascular fitness is a key factor in reducing the chances of heart disease, stroke, diabetes, high blood pressure, certain forms of cancer and depression.

It is important that to consider yourself fit; you should have reasonable ability in both these areas. It can be quite easy to be very good at running and maintain a low body weight but this may be hiding poor levels of strength, conversely, you may appear to have good levels of strength but this may be due to increased body weight and may have the resulting effect of limiting your cardiovascular ability. Developing your overall fitness should be the goal and the following programme has been designed to train you in both these areas to the standard required.

Cardiovascular training

Enhancing ones cardiovascular fitness will result in improved performance, faster recovery times following exercise, larger heart muscle (which improves cardiac output), decreased blood pressure and resting heart rate, improved body composition and overall greater energy levels.

Any programme must be appropriate to the individual concerned and the programme supplied is designed for those individuals who feel they need training in one or both areas to bring themselves up to the standard required or those who have failed to achieve in a recently conducted test. Improving ones fitness should still be a high priority for all those at the recruitment and induction stage, to prepare sufficiently for the physical education curriculum administered at the Scottish Police College.

To train effectively for cardiovascular conditioning the **F.I.T.T** principle should be adhered to:

Frequency: 3-5 times a week (twice may be appropriate to start with)
Intensity: 70%-85% of age-predicted maximum heart rate (APMHR)
Time: 20-60 minutes
Type: Running, cycling, swimming, climbing etc

To find APMHR:
Males 220 – (age)
Females 226 – (age)
E.g. 20 year old male 220 – 20 = 200 beats per minute (BPM)
Set the intensity range: 70% = 140 BPM 85% = 170 BPM
Training zone or target heart rate range is: 140 – 170 BPM

NB. It should be noted that this formula is only provides an estimate, with an error range of 10-15 beats/min.

How to work out your heart rate during exercise

Wear a heart rate monitor (retail for between £30 and £200).

Most cardiovascular machines in gyms have built in heart rate monitors, which will give you a reading when held. Although not ideal, you can stop your session briefly and take your pulse. At the side of your neck (carotid artery) should be easy to find. Count the beats for 15 seconds and multiply that number by 4. This will give you a reasonably accurate figure for beats per minute.

If training with other people, you can self-administer a 'talk test'. This involves simply speaking to each other and seeing how easy it is to maintain conversation. If you have to catch breath every 3 or 4 words, you will be in the right sort of training zone. If you cannot speak at all, you are probably working too hard and if you can speak with ease, and then you're not working hard enough.

The other key factors in a successful training programme are:

Fatigue – During a session, you must work hard enough to cause a degree of fatigue. Whereas the 'no pain – no gain' motto is no longer generally accepted in the industry, the exercise must be hard enough to leave you feeling like you have worked hard by the end of it. 'Cruising' through a training programme is unlikely to result in a successful outcome.

Recovery – If you train effectively, then you must recognise the body's requirement to recover. Allowing sufficient recovery time following a training session is imperative, as exercising without adequate rest may result in over training, which can actually lead to decreases in fitness. The period of recovery will depend upon your current fitness level and the intensity of the session performed. Generally, a recovery time between 24-72 hours should be appropriate, but aim to train every second day as a general rule. If your muscles still hurt following a session (in itself not a bad sign), it is best not to train those areas again until they have had time to recuperate.

Progression – It should be an obvious aim of any training programme, but many people fail to progress their fitness. To make improvements in fitness you must give the body something more than it has had to do before. This is called 'overload'. This ensures that during recovery, the body will 'over-compensate' leaving you fitter and able to cope with that training load again. If you repeat the same session (time, intensity, type) on more than 3 occasions, the body will no longer respond and will stop improving.

How to overload:

Aim to increase an element of your session, such as the frequency, duration or intensity. Don't do too much too soon – an overload of 5%-10% is safe. This would equate to a weekly increase from 20 minutes to 22 minutes in each cardiovascular session for example, or a weight increase from 20kg to 22.5kg on a resistance exercise.
Increase only one aspect at a time. For example: aim to run for 8 minutes at 10 minute/mile pace, then every session increase the time by 30 seconds until you reach 12 minutes. Then drop the duration back down to 8 minutes (or more if you think you can cope) but increase your speed to 9:30 minute/mile and build the duration back up again. For resistance training, increase your repetitions initially, then sets (if required) and then the weight.

NB. This is for example only and should not be followed as a training programme.

How to guarantee results

If you follow the principles of fatigue (through appropriate intensities), sufficient recovery and progression (through overload) then you will create a 'training effect'. It is this training effect, which produces a fitter, stronger, more conditioned individual who can endure greater loads and tasks, with quicker recovery times.

Some important information for your training

Seek advice from a medical professional, ensuring that you are in good health and able to participate in regular physical exercise.

Footwear – should provide comfort, cushioning, stability and durability. When running, each foot strike causes impact forces of 2-4 times a person's body weight. Not all training shoes suit an individual due to the natural movement of the foot when walking and running therefore, if you are doubt about the right pair of training shoes for you, consult a podiatrist or visit a specialist running or sports shop, who should be able to advise appropriately.

Clothing – should provide warmth in cold environments and allow you to keep cool in warmer environments. Layered clothing is best in the cold and try to find the right balance – not too much, not too little. When exercising in warmer climates, loose fitting, thin/wicking materials are best.

Fluid intake – During high to moderate intensity exercise, the body can lose 1.5-3.5 litres of fluid every hour, but the digestive system can only absorb approximately 1 litre of fluid per hour. The consequence of this possible constant fluid deficiency requires the exerciser to hydrate before, during and after sessions. Plain, cool water is perhaps the best fluid to take as it enters the tissues fastest but sports drinks may be appropriate for exercise durations of longer than an hour. Over and above normal hydration, you should drink half a litre of water 2 hours prior to exercise, which allows time for the excretion of excess fluid. During exercise it may be best to drink at intervals between 10-30 minutes (if the session is to last that long of course). After exercise, simply keep drinking if you feel thirsty.

Warm-up – Prior to entering into the main part of your programme, you should perform a short warm-up. This period of low intensity exercise serves to increase blood supply into the muscles, raises your core temperature and prepares you both physiologically and psychologically for the session. It will also, when performed with appropriate stretching, reduce the chances of sustaining an injury. A warm-up should contain about 5 minutes of low intensity activity such as jogging or any other cardiovascular exercise at a comfortable level. By the end of this 5-minute period you should feel slightly out of breath but not feel over-exerted. This should be followed by some stretches of the major muscle groups, with each stretch held to a point of mild tension for 8-10 seconds. After this you are ready for the main part of your programme. If you are doing cardiovascular training then start off light again and build up to your prescribed exercise intensity over the next 3-5 minutes. If you are doing resistance training then perform one warm-up set (of 12 repetitions) of each exercise with approximately 50% of your prescribed weight.

Cool-down – On concluding a cardiovascular training session it is important to gradually reduce the heart rate and blood pressure back towards resting levels by remaining active for a subsequent 5-10 minutes. By gradually reducing the intensity of your exercise, down to a walking pace should be adequate. This should then be followed by a few minutes of stretching, concentrating on the working muscle groups from the session. Each stretch should be held for 25-30 seconds.

Injuries – Should you sustain an injury, it is recommended that you be assessed by a medical professional prior to continuing with a programme. For the immediate treatment of the injury you may wish to follow the R.I.C.E procedure.

Rest the injured part Ice apply ice/cold compress. Not in direct contact with skin. Compression compress the injury Elevation raises the injured part of the body, if appropriate.

Training programmes

A cardiovascular programme and a resistance-training programme have been supplied on a separate basis. You can train on both programmes on the same day if you choose. If you do so, then perform your resistance work before the cardiovascular work.

Cardiovascular programme

The programmes supplied are based upon training over a 6-week period prior to testing. This is considered the shortest timescale to follow programmes of this design. If you have more than 6 weeks of developmental time, you should use this time appropriately. The programmes can be extended to 12 weeks for example; by simply following the same pattern but repeat each week once, using progression throughout of course.

Exercise Frequency Options						
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
Two days exercise, five days rest (for those with no exercise experience)						
Rest	Exercise	Rest	Rest	Exercise	Rest	Rest
Three days exercise, four days rest						
Rest	Exercise	Rest	Exercise	Rest	Exercise	Rest
Four days exercise, three days rest						
Exercise	Rest	Exercise	Rest	Exercise	Rest	Exercise

The programme is designed to be followed over a six week period prior to your test date and is aimed at those who would not achieve the required standard without suitable training. This of course, is not to say that those individuals who maintain a reasonable or good standard of fitness have no requirement to train, as it is equally important for everyone to perform to their full potential. For those individuals, the specifics of the programme supplied will not be of use but the information pertained in this document will still be valid.

*Please note: exercising on a treadmill alone does not train you for running outdoors. If you do use a treadmill then set a 1% incline on the machine, which will more accurately reflect the demands of outdoor running.

All speeds listed in the programme are suggested paces for your training. You can control whether you run faster or slower than that pace. The rule should always be that your pace should be able to develop as the programme goes on.

Week	Session 1	Session 2	Session 3	Session 4
1	**Treadmill/Outdoor Running** *15-20 minutes* Alternate equal periods of running and brisk walking for allotted time. Pace of approx: 10-12 min/mile	As session 1	**If you feel able to do a third session in this week** As session 1	
2	**Treadmill/Outdoor** *15-25 minutes* Alternate periods of running with brisk walking. Aim for: 2:1 work to rest ratio. *i.e. 2min work/1min rest* Running pace of approx:10-12 min/mile	As session 1	**If you feel able to do a third session in this week** As session 1	
3	**Outdoor Run** *8-10 minutes* at 10 min/mile pace *then 3-5 minutes* walking *then 6-10 minutes* at 10 min/mile pace	**Treadmill/Outdoor** *12-18 minutes* steady pace throughout 10 min/mile pace	As session 1	
4	**Outdoor Run** *5 minutes* at faster pace than usual *then* *3-4 minutes* light jogging/walking *then* repeat this format **twice** more.	**Outdoor Run** *14-20 minutes* steady pace throughout 10 min/mile pace	**Outdoor Run** 1.5 mile run Performed at maximum exertion Record your time.	*If you feel able to do a fourth session in this week* As session 2
5	**Outdoor Run** Tempo training *3-5* minutes @ top pace you can manage for that time period *then* *30-90* seconds walking *then* repeat this format for another **3** times.	**Outdoor Run** *18-25 minutes* maintain good pace throughout	**Outdoor Run** *2.5-3 miles* at steady pace	**Outdoor Run** As session 1
6	**Outdoor Run** *1.5 mile run* Performed at maximum exertion Record your time.	**Outdoor Run** *3-4 miles* at steady pace	**Outdoor Run** Tempo training As week 5	**Outdoor Run** *25-30 minutes* maintain a good pace throughout

NB. Leave a clear 2-day recovery between your last cardiovascular training session and your assessment day.

Resistance training programme

A resistance-training programme, for those who have not followed a structured programme in the past, must begin with exercises performed at a light to moderate intensity. This is to 'teach' the muscles the new movement patterns involved before loading them with too much resistance, which is a major cause of injuries during such training.

The recommended number of sessions per week is 2-3, with at least one-day recovery between sessions. The exercises used should work the major muscle groups of the upper body. During this six-week stage, it is recommended that you do not include any lower body resistance exercises, as the legs will need to be in good condition for the cardiovascular element of your training. Any subsequent resistance programmes should include lower bodywork.

An excellent way to introduce oneself to resistance training is by attending circuit classes. Circuits require you to perform one exercise for an allotted period of time, then rest for a short period, then move onto another exercise and continue in that vain.

The following programmes have been designed specifically for use in a gym. All of the exercises listed are standard movements and all well-equipped gyms will have the equipment required. If at all unsure about any element of the programme or for instruction, contact the gym staff that should be able to help.

Programme 1 – endurance/starter based training

Exercise	Sets	Reps	Notes
Chest Press	2-3	15-20	For all exercises Select a resistance, which leaves you with a feeling of fatigue in the working muscle group(s). Take a 30 second recovery at end of each set If you can achieve 20 reps without discomfort in all your sets, then increase the weight.
Seated Row	2-3	15-20	
Shoulder Press	2-3	15-20	
Bicep Curl	2-3	15-20	
Abdominal Curl	2-3	10-20	Both exercises in this section are to be performed without resistance, on a mat. Seek advice on proper technique
Back Extension	2-3	10-20	

This programme should be followed for approximately 6 sessions over a 2-3 week period.

Do not train a muscle group if you feel any form of pain or tenderness in that area until you have recovered fully.

Programme 2 – strength based training

Exercise	Sets	Reps	Notes
Chest Press	3	6-12	For all exercises Select a resistance, which causes you to fail to complete a set within the repetition range (6-12). Take a 60-90 second recovery at end of each set. If you can achieve 12 reps in each set, then increase the weight in one set initially and build up from there.
Seated Row	3	6-12	
Shoulder Press	3	6-12	
Bicep Curl	3	6-12	
Abdominal Curl	3	10-20	Both exercises in this section are to be performed without resistance, on a mat. Seek advice on proper technique
Back Extension	3	10-20	

NB. Leave a clear 4-day recovery between your last resistance training session and your assessment day.

Nutritional Advice

Nutrition and exercise are two elements of key importance when training towards a specific goal. Focusing on one at the exclusion of the other will lead to less than optimal results.

A good way to work out your 'estimated' daily calorie requirement is shown in the table 1.

	Male	**Female**
Activity level	**Kcal per kg of body weight per day**	**Kcal per kg of body weight per day**
Light (no regular exercise)	38	35
Moderate (light to moderate intensity exercise 2-4 days a week)	41	37
Heavy (moderate to high intensity training 4-5 days a week)	50	44

Table 1. Adapted from National Strength and Conditioning Association

If weight loss is the goal, then simply burn more calories (through activity) in a day than you consume in a day (through diet). A 1-2lb weight loss per week represents a daily calorie deficit of 500-1000 kcal.

Should weight gain be the goal (perhaps an option if you need to improve strength), an additional 350-750 kcal daily would support a weekly weight gain of 1-2 lbs. This would obviously only work in conjunction with a vigorous resistance training programme otherwise the extra calories will be stored as fat.
Another way of judging a daily diet may be to follow the guidance below:

Food Guide Pyramid
Bread (wholegrain), cereal, rice and pasta (wholewheat) 6-11 servings
Fruit 2-3 servings
Vegetables 3-5 servings
Milk, yoghurt and cheese 2-3 servings
Meat, poultry, fish, pulses, eggs and nuts 2-3 servings
Fats, oils and sweets use sparingly

What constitutes a serving?
Bread – one slice
Cereal – 28 grams
Pasta/rice – half cup cooked
Vegetables – half cup
Fruit – one piece or half cup of tinned fruit
Milk and yoghurt – one cup
Cheese – 42-56 grams
Meat – 56-85 grams
Egg – one egg
Nuts – handful of

For more information on nutrition, visit The Food Standards Agency website www.eatwell.gov.uk

Nutrients
There are six nutrients: Carbohydrates, protein, fat, vitamins, minerals and water.

Carbohydrates – are the main source of fuel for energy and are required for the complete metabolism of fatty acids in the body. Therefore, a diet with a lack of carbohydrates will limit the body's ability to perform moderate to hard physical activity. The amount of carbohydrates required is very much dependant upon a person's activity level, the more active a person is – the more fuel required.

A recommended 5 to 6 grams of carbohydrates per kg of body weight is accepted as an adequate intake to support a lifestyle involving moderate intensity exercise.

Sources of carbohydrates: Breads, grains, pasta, potatoes and rice.

Protein – is used by the body for building and replacing lean tissue (muscle) and should not merely be considered as a nutrient used by bodybuilders to gain large amounts of muscle mass. If energy stores in the body are severely depleted then protein can be burned for energy.

Protein is an essential nutrient when participating in physical training, particularly resistance (strength) training as the proteins consumed in the diet work to 'repair' the damaged muscles (which is actually an important factor in successful resistance training programmes).

A recommended 1.4 to 1.8 grams of protein per kg of body weight is considered a good range for all those participating in an exercise programme of moderate to high intensity, including strength training. For example a 60kg/9 stone 6lbs person may aim to consume approximately 90 grams of protein per day and a 76kg/12 stone person could aim for approximately 120 grams.

Sources of protein: meat, fish, poultry, dairy products, eggs, nuts and pulses.

Dietary Fat – Although excessive consumption of dietary fat should be avoided, a certain amount is essential. Fats supply essential fatty acids, which the body cannot naturally produce and provides insulation for vital organs. Most of the fat a person consumes should come from natural sources (unsaturated) as opposed to processed foods (saturated fats).

A recommended 15-20% of daily calories should come from dietary fats.

Good sources of dietary fat: oily fish (mackerel, salmon, trout, fresh tuna), nuts, olive oil (Food Standards Agency, UK)

Vitamins and Minerals - Vitamins help regulate fat, carbohydrate and protein metabolism in the body. They cannot be made by the body and have to be provided through a person's diet. Minerals have many roles in the body's functioning. Apart from the formation of strong bones and teeth, they also help to control the nervous system, fluid balance in tissues and muscular contractions. Minerals are as essential as vitamins and they also, cannot be made in the body. All our bodies' mineral needs have to be supplied from the diet. (Bupa website)

A balanced diet will provide all essential vitamins and minerals, with fruit and vegetables being of particularly good value.

Water – Adequate water intake is essential for everyone, particularly those participating in regular exercise. Water is essential to aid digestion, nutrient absorption and the removal of waste products. It also helps regulate circulation and body temperature.

A daily intake of 1.5-2.5 litres of fluid is considered adequate for those living a sedentary lifestyle, however not all fluid must be water, but caffeinated drinks and alcohol should not be included in this figure due of their diuretic effect (which can cause dehydration). Obviously, by taking regular exercise the required amount will be greater.

It should be noted that if your body is dehydrated by 2% or more, this will reduce any physical performance by a marked amount.

Following an appropriate training regime and committing oneself to eating a balanced diet, there is no reason why significant improvements would not be made in fitness and body composition.

This section has been formulated through research from The National Strength and Conditioning Association; The Food Standards Agency (UK) website and Bupa (UK) website.