

POST In-Service



Physical Fitness Program

OFFICER'S MANUAL



THE COMMISSION
ON PEACE OFFICER STANDARDS AND TRAINING

STATE OF CALIFORNIA

State of California

Commission on Peace Officer Standards and Training



**POST
In-Service
Physical Fitness Program**

OFFICER'S MANUAL

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PREFACE

The fitness program described in this manual represents the culmination of a major effort by the California Commission on Peace Officer Standards and Training to respond to the needs of law enforcement agencies for a model physical fitness program.

The program is designed to promote officer fitness by recognizing officers who achieve and maintain exemplary levels of physical fitness. Officer participation in the program is intended to be voluntary. The program contains pre-screening components, age and gender based physical testing standards, and requires all participants to develop and maintain a personal exercise program.

POST is pleased to be able to offer this program as a means of assisting local law enforcement agencies. We are confident that you will find the program useful. Any questions that you may have about the program should be directed to the POST Standards and Evaluation Services Bureau at (916) 227-4820.



NORMAN C. BOEHM
Executive Director

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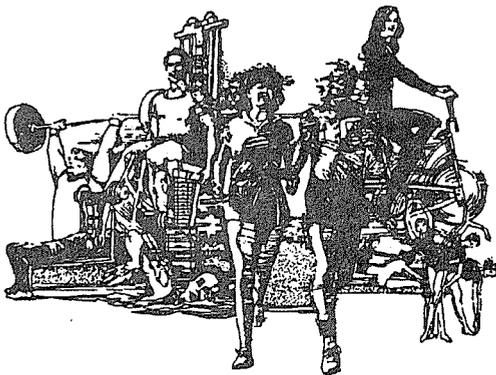
INTRODUCTION

Welcome

Welcome to the POST In-Service Physical Fitness Program.

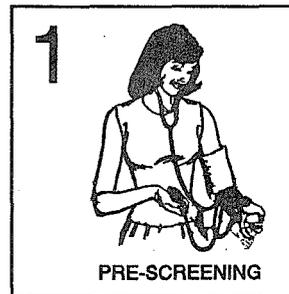
This program is designed for **YOU**. It doesn't matter if you're an entry-level officer or a chief administrator, male or female, young or old, super-athlete or couch-potato, this program will work for you.

The program offers no magic bullet, drug, pill or diet for becoming fit. All you need to achieve success is the will to make a change. If you're reading this page, you've already taken the first step. Great things can happen to your body, your attitude, and the way you look and feel if you adopt this simple program and stick with it.



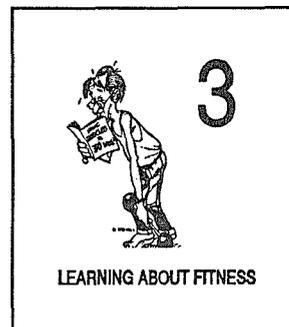
Program Activities

The program consists of four primary activities:



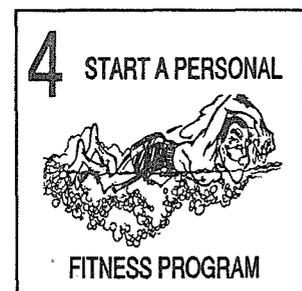
Pre-Screening means assessing persons entering the program to help assure that they are free from conditions that could be aggravated by exercise or fitness testing.

Fitness Assessment and Recognition consists of taking a battery of fitness tests. The scores from these tests are used to help determine eligibility for special awards.



Learning About Fitness means becoming familiar with what it takes to become physically fit. Examples include knowledge of the principles of conditioning, nutrition, and weight control.

Starting a Personal Fitness Program refers to using the knowledge you acquire about fitness to create and maintain a program that fits your lifestyle and includes activities that you enjoy.



Program Overview

Participation in the program involves the following general steps. The exact nature of each may vary somewhat from agency to agency.

- 1) Attend a program orientation.
- 2) Complete and turn in an Informed Consent form.
- 3) Obtain and complete a Physical Exercise Readiness Questionnaire (PERQ).
- 4) If required, obtain a medical clearance.
- 5) Read the Officer's Manual.
- 6) Complete a RISKO form.
- 7) Have your cholesterol level assessed.
- 8) Schedule and complete a Fitness Assessment.
- 9) Meet with the fitness coordinator regarding your fitness assessment and your personal fitness program.
- 10) Implement your personal fitness program.

Attend an Orientation. During the orientation, the fitness coordinator will present an overview of the program and will provide copies of the necessary forms and documents that you will need in order to participate. This material should include the *Officer's Manual* (this manual), an *Informed Consent form*, the *PERQ*, the *RISKO form*, and, if needed, a letter to a physician that describes the program requirements and is accompanied by a medical clearance form.

The Informed Consent Form. Before you begin, you must read and sign a *Fitness Program Informed Consent form*. A copy of this form is included as Attachment A. The Informed Consent form asks you to acknowledge that you understand the program and requirements. This form must be completed in order to enter the program.

Pre-Screening: Determining Your Readiness for Physical Activity. Most officers will not need to see a doctor before they begin the program, since a gradual, sensible program, such as this, will have minimal health risks.

To find out if you must consult a doctor before you start, you will need to complete a checklist called the *PERQ* -- which stands for "Physical Exercise Readiness Questionnaire."

A copy of the PERQ is shown in Attachment B. If you answer "YES" to any of the questions in the PERQ, you must be cleared by a physician before you can begin the program.

Your fitness coordinator will provide you with a copy of the PERQ. You will need to complete and return it to the coordinator before you begin. If you answer "YES" to any of the questions, the fitness coordinator will give you a *Physician's Letter* that describes the In-Service Fitness Program. You will need to take this letter and a Medical Information Release form to your doctor to get a clearance to participate.

If you answer "NO" to all the questions, you will be able to immediately enter the program.

Read the Officer's Manual. There are three reasons why participants should become familiar with the contents of the Officer's Manual:

- 1) because it completely describes the program,
- 2) because it contains valuable information on fitness and health, and
- 3) because you will be tested on its contents as part of the program's assessment procedure.

Check Your Cholesterol. This program emphasizes those factors known to have an effect on an individual's risk for coronary disease. Cholesterol is one of those factors. Consequently, each participant is required to know what cholesterol is as well as his/her personal cholesterol level. A discussion of cholesterol is presented in this manual (see

pages 26-28). If you have not had your cholesterol checked within the preceding year, it is your responsibility to have it analyzed. Your fitness coordinator will provide you with the names and phone numbers of local organizations that can provide this information.

Complete a RISKO Form. *RISKO* is a short, self-administered questionnaire that is based upon eight factors that have been identified as being related to the development of heart disease.

The RISKO form (see attachment C) provides a convenient way to become aware of what these factors are; it also gives you a good indication of your relative risk of developing heart problems. The fitness coordinator will give you a copy of the form.

We want you to be aware of your relative risk so that, if it is high, you can begin to do something to reduce it. If you have questions about completing and interpreting the RISKO form, ask your fitness coordinator.

Preparing a Personalized Exercise Program. After you read the manual, you should be equipped with the knowledge necessary to set up a personal exercise program that will work for you. A form for developing your program is provided in attachment D. You will be required to describe your program on this form as part of the fitness assessment described below. Following the fitness assessment, the fitness coordinator will review your program to assure that it covers the required objectives, calls for reasonable effort, and is safe.

Schedule and Complete a Fitness Assessment.

The fitness assessment consists of five physical fitness tests and a paper-and-pencil test covering important fitness concepts. As indicated previously, you will also be required to complete a form that describes your personal fitness program. The completion and submission of this form is a required part of the program.

The five physical fitness tests are the 1.5 mile run, push-ups, bent-knee sit-ups, body composition measurement (skinfolds) and a sit-and-reach test. As explained later, individuals may elect to perform a 3 mile walk or another valid test of cardiovascular fitness instead of the 1.5 mile run.

A complete description of each test is provided in attachment E.

Attend a Fitness Consultation. Following your fitness assessment, the fitness coordinator will meet with you to review the results of your tests. At the meeting you will also discuss the principles of conditioning and how they apply in the personal exercise program that you develop.

Implementing Your Personnel Fitness Program. After your consultation, you are basically on your own. The expectation is that you will begin and follow the personnel exercise program that you created. Your fitness coordinator, of course, will be available should you have questions.

WELLNESS AND LIFETIME PHYSICAL FITNESS

What is Wellness?

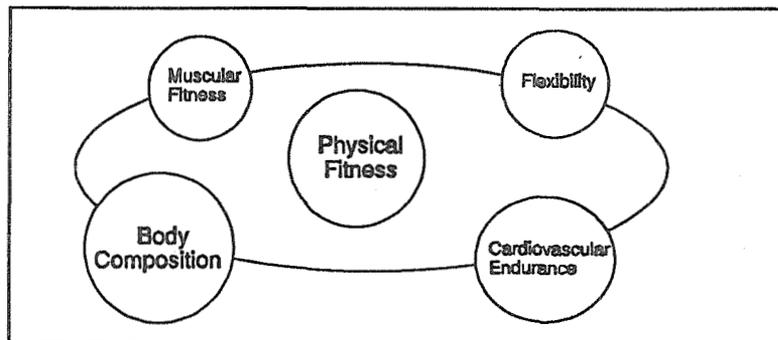
Wellness means the realization of our highest potential for total well-being. The quality of life is important to all of us. While some things which affect quality of life are beyond our control, many things are very much in our control. Wellness focuses on the reduction of risk factors such as poor nutrition, tobacco use, stress, alcohol and drug abuse, and the lack of physical fitness and regular medical care. The primary focus of this program is physical fitness, with attention also given to nutrition and medical care.

What Is Physical Fitness?

The President's Council on Physical Fitness gives the following definition:

Physical fitness is the ability to carry out daily tasks with vigor and alertness, without undue fatigue, and with ample energy to enjoy leisure time pursuits and to meet unforeseen circumstances.

Total physical fitness involves four basic components that are separate but interrelated: cardiovascular endurance, muscular fitness, flexibility, and body composition. These basic components form the core objectives of this program.



The Components of Fitness

Cardiovascular Endurance

Cardiovascular fitness (also known as aerobic fitness, cardiorespiratory fitness and cardiopulmonary fitness) refers to the ability of the heart, lungs and blood vessels to deliver adequate amounts of oxygen and nutrients to working cells during prolonged physical activity. Achieving and maintaining appropriate levels of aerobic fitness are considered to be key ingredients in any physical fitness program. Someone who is aerobically fit is able to deliver the required oxygen and nutrients to the working tissues with relative ease; someone who is not aerobically fit must work much harder to do this.

Aerobic activities include any activity that is rhythmic in nature, uses large muscle groups, is conducted at sufficient intensity, and is sustainable for at least 20 minutes.

Examples include cycling, jogging, power walking, running, aerobic dancing and swimming. The 1.5 mile run (or the 3 mile walk) is the test used to assess cardiovascular fitness in this program.

Flexibility

Flexibility refers to the range-of-motion through which limbs or body parts are able to move. Decreased range-of-motion limits the ability to perform certain movements and has been associated with increased injury, pain and low back problems. The range of motion about a joint is highly specific and can vary in an individual from one joint to the next.

Flexibility is best enhanced by stretching warm muscles following a workout. The Sit-and-Reach test is the test used in this program to assess flexibility.

Muscular Fitness: Strength and Endurance

Muscular fitness consists of muscular strength and muscular endurance which refer, respectively, to the ability to exert a maximal force and the ability exert a sub-maximal force repeatedly over a period of time.

Muscular strength activities usually involve weight training where moderate to heavy weights are used with few repetitions (e.g., 9-12 repetitions on the bench press to temporary muscle fatigue). Muscular endurance activities involve many repetitions performed under light to moderate loads and may include weight training or calisthenic exercises. Push-ups and abdominal crunches are the tests used in this program to assess muscular fitness.

Body Composition

Body composition refers to the amount of fat and lean tissue within the body. Maintenance of acceptable body fat levels is considered an important fitness goal, and as we approach 50 years of age and beyond, it becomes increasingly more important that we have sufficient lean muscle tissue. The test used in this program to assess body composition is Percent Body Fat. Percent Body Fat can be measured by several techniques such as skinfold calipers, electrical impedance, circumference measurement and hydrostatic weighing (dunk tank). Since these procedures vary in terms of cost and amount of expertise required to conduct the test, the exact procedure used in your agency will depend upon local circumstances.

The distribution of fat is also becoming recognized as a factor related to cardiovascular health. A test called the waist-to-hip ratio indicates this distribution in the body. This optional test is shown in attachment E.

The best approach to reducing excess body fat is to combine cardiovascular fitness activities with moderate caloric reduction. Cardiovascular fitness exercise is the activity of choice for fat reduction since more calories are burned with this form of exercise.

Maintaining Fitness

There are many benefits associated with a program of regular physical exercise that addresses all four fitness components (i.e., cardiovascular endurance, flexibility, muscular strength and endurance, and body composition). These include:

- Improved and strengthened cardiovascular system (heart and blood vessels)
- Improved strength and endurance of your muscles
- Improved posture
- Improved looks (by maintaining proper weight and firming the body)
- Improved flexibility (which reduces the risk of low back problems)
- Decreased risk for chronic diseases (heart disease, cancer, stroke, high blood pressure, lung disease, arthritis, etc.)
- Relief from tension and help in coping with the stresses of life

While this list is very impressive, there may be an even better reason for exercising on a regular basis: Most people report that they feel better when they exercise regularly. Maintaining a regular fitness program can produce results that are not achievable by any other means. It is a worthy investment in you.

To achieve these benefits, you must accept that exercise needs to become a *regular* part of your life. Since exercise benefits cannot be stored, exercise must be a part of your daily lifestyle, much like eating, sleeping and working. This involves a commitment both physically and mentally. Imagine what would happen if you were willing to exercise 1 hour a day, 4 days per week (Mon-Wed-Fri and one day on the weekend). That's a total of 4 hours per week. Since there are 24 hours in a day, there are 7 X 24 or 168 hours in a week. So, if we divide 4 hours by 168 we get 2%! A 4-hour

commitment per week would use only 2% of your whole week; a small price for such a large return.

FITNESS ASSESSMENT AND RECOGNITION STANDARDS

Fitness Assessment

As mentioned previously, an integral part of the POST In-Service Physical Fitness Program is the evaluation of your current fitness status. This is achieved with the battery of tests described earlier. There are two major reasons why your participation in the testing process is required:

- 1) To provide you with valuable information on your current state of fitness (to use as a baseline for exercise prescription and for gauging future progress); and
- 2) To allow your agency to recognize those participants who have reached exemplary levels of physical fitness.

Recognition Standards

The program is designed to recognize those participants who reach exemplary levels of fitness. There are three levels of recognition, gold, silver and bronze. These levels are defined in the chart on the next page.

The percentiles used are based on both age and gender. A 50 year old man is compared to men of the same age. Likewise, a 25 year old woman is compared to women of the same age. The normative tables that the standards are based upon are provided in attachment F.

Keep in mind that the 50th percentile is the average for a person of your gender and age.

The test battery is to be administered at least annually. Once you qualify at a particular level, your status at that level is valid for one year or until you retest.

PRINCIPLES OF CONDITIONING

There are some very basic principles of training that apply to all aspects of physical conditioning. Understanding these principles will greatly enhance your ability to create and evaluate your own personal exercise program. These principles are discussed below.

Individual Differences/Pre-Training Fitness Status

Because of such factors as size, heredity, nutrition, and age, people beginning an exercise program almost always vary in their initial level of physical fitness. It is important to be aware of these differences since your initial level of fitness will have a marked effect on your potential to improve. The closer you are to your maximal capacity, the more difficult it is to make substantial improvements. Likewise, the more unfit you are, the larger the gains you can expect in response to appropriate training stimuli. This is one of the reasons for the assessment at the beginning of the fitness program. The results of your initial testing will help you to properly determine the level of exercise appropriate for you at the beginning of your exercise program.

Specificity of Training

Specificity of training refers to the fact that exercises utilized to accomplish a particular conditioning objective are specific to that objective and have little or no effect on other objectives. For example, performing as many abdominal crunches as possible in two minutes on a regular basis will dramatically improve muscular endurance of your abdominal muscles, but it will do very little to improve your peak strength. Likewise, touching your toes will increase flexibility, but will have little effect on your aerobic capacity. This is one of the most important principles of training, and should be reflected in the activities you select for inclusion in your personal fitness program. Activities should be chosen to meet specific objectives.

Recognition Level	Total Points*	In addition to the required point totals, participants must know their cholesterol level and must meet the criteria shown below.
Bronze	300	Scores on 3 tests at or above the 60th percentile; no scores below the 50th percentile.
Silver	350	Scores on 4 tests at or above the 70th percentile; no scores below the 60th percentile. No tobacco use in the last 2 months.
Gold	400	Scores on 4 tests at or above the 80th percentile; no scores below the 60th percentile. No tobacco use in the last 12 months.
* Total Points = Sum of Percentiles (e.g., 80 points for achieving the 80th percentile, 90 points for achieving the 90th percentile, 55 for the 55th percentile, etc.; points are summed across all 5 tests; percentiles are in five percent (5%) increments.)		

Frequency of Training

Frequency of training is another important consideration. Most research indicates that the training frequency should be at least three times per week for significant improvement. Additional benefits occur if the frequency is increased to four or five times per week. De-training is likely to occur with fewer than three sessions per week. The personal exercise program you develop should include a minimum of three conditioning sessions per week.

Overload

Overload refers to placing increased demands upon the various systems to produce continued improvement. With regard to muscular strength, for example, lifting the same amount of weight throughout the course of a training program will not continue to produce significant improvement. To reap maximum benefits, the amount of weight lifted should be increased in a progressive fashion. There are many methods of imposing progressive overload, e.g., increasing the weight lifted, increasing the repetitions of a weight lifted, increasing the pace while running, running farther, running for a longer period of time. Overload is an important factor in any physical conditioning program. Regardless of the frequency or specificity of the exercise, an insufficient training stimulus will not improve your condition.

For most conditioning activities the overload criteria will probably need to be incremented about every two weeks until you have achieved your fitness goal. Once your goal is reached, you should maintain the last load.

NOTE: The maximum progression for overload should be no more than 10 percent (10%) every two weeks, regardless of exercise activity.

Intensity

Intensity is an application of the overload principle and refers to the level at which you exercise. An individual needs to train at a certain intensity level (threshold) for improvement to occur. For example, an Olympic caliber runner will receive little or no benefit from walking a mile because the training intensity is far too low. Likewise, training at an inordinately high intensity level can also result in less than optimal training benefits. Intensity is usually monitored by using heart rate (aerobic training) or counting repetitions or sets (strength training).

Time

Time (duration) of exercise refers to the length of time that you exercise at a given intensity. It is directly related to intensity. For example, running at 95% of maximal heart rate can only be sustained for a brief period of time, while jogging at 70% of maximal heart rate can be sustained for a much longer period of time. In order to produce a cardiovascular training stimulus, exercising for at least 20 minutes in the training heart rate zone is recommended.

Type

Type (mode) of training refers to the different types of training activities that can be used to achieve the same objective. For example, swimming and running are excellent activities for achieving cardiovascular endurance, as are cycling, aerobic dance, and cross-country skiing.

Enjoyment

Enjoyment of training is perhaps the most important training principle. If the pursuit of physical fitness is enjoyed, it is more likely to be continued. One of the most important goals of this program is to provide you with the satisfaction and confidence to pursue lifetime fitness. Clearly, this is a tough task if you are performing exercise activities that you don't like. On the other hand, significant fitness gains require significant persistent effort. One way that you can increase the likelihood that you will pursue the goal of lifetime fitness is to choose activities that you enjoy and to introduce variety in your program by changing activities from time-to-time.

Plateauing

Plateauing or failure to sustain progressive improvement is a phenomenon that tends to occur in an individual after a period of improvement and may be due to a number of factors. This period is generally short lived and improvement is once again noted. If you feel that you are not improving, hang in there.

Continue your effort and you will soon see progress.

Deconditioning

Deconditioning occurs when the training stimulus either ceases or falls to a sufficiently low level. At this point, the gains made during training begin to fade and will continue to do so until an adequate training stimulus is reinstated.

Research indicates that levels of endurance, strength and power are reduced once training stops. The trend is for the reductions to be very large during the first month following cessation of training. It is, therefore, very important to continually maintain your program. If you go on vacation, try to alter your exercise program so that it can be performed "away from home." If this is not possible, be sure to begin your program again as soon as you return.

Components of an Exercise Session

To be effective, each exercise session in your personal fitness program must contain three general components: (1) warm-up, (2) conditioning period, and (3) cool-down. These components are considered to be essential ingredients in the design of any sound exercise program. The significance of each component is discussed below.

1. The **WARM-UP** serves as a preparation for the actual conditioning session. In addition to preparing the body for the upcoming workout, it also helps to protect against injuries and muscle soreness. A proper warm-up should gradually increase the heart rate and blood flow as well as prepare the muscles for more vigorous exercise. The initial phase of the warm-up should consist of exercises that are relatively moderate in intensity, involve the entire body, and cause a gradual (not sudden) increase in heart

rate. This should take about three to five minutes and include activities such as walking and/or easy jogging.

Over and above preparing the heart and lungs for action, the warm-up also increases muscle temperature so that the second phase of the warm-up, stretching, will be more effective. It is better to stretch muscles that are warmed up. Thus, after the general warm-up, a proper amount of time should be spent on stretching. The stretching phase of the warm-up should take about 5 minutes. An effective method of stretching is to slowly stretch until the point of resistance is encountered, holding that position for 10-20 seconds, and then relax. Each stretching exercise should be repeated until the muscle group feels supple. **DO NOT BOUNCE and DO NOT STRETCH TO THE POINT OF PAIN.** Also, if the weather is especially cool, more time should be spent in both warming up and stretching. A series of recommended stretches is included in attachment G.

2. The **CONDITIONING PERIOD** constitutes the main component of the exercise session. It is during this period that the intensity of exercise is increased to produce a training stimulus. The content of the conditioning period is tailored to your specific training objective(s). For example, if the objective of your session is to increase cardiovascular endurance, the conditioning session could include circuit training, jogging, power-walking, swimming, or cycling, depending upon equipment/facility availability and what you enjoy most. If the objective is to increase muscular fitness, then the session might focus on weight training or calisthenics.
3. The **COOL-DOWN** is the tapering off period that occurs after the conditioning period. The most important aspect of the cool-down period is a continuation of activity at a decreased intensity. For example, if your conditioning period consisted of running at a vigorous pace, then your cool-down should begin by

reducing the pace to a slow jog or perhaps even a fast walk. The general idea is to bring your heart rate down to around 100 or 110 beats per minute within three to five minutes.

Immediately following this decrease in activity aimed at gradually lowering the heart rate, it is desirable to finish off with some flexibility exercises for a few minutes. The exercises for cool-down should emphasize stretching the primary muscle groups employed during your "conditioning" phase; e.g., for continuous running, stretching should focus on the legs, hips and low back. A properly conducted cool-down will help your body recover from exercise, help to prevent muscle soreness (by facilitating the removal of lactic acid), and improve your flexibility.

Minimum Personal Exercise Program Requirements

At a minimum, the personal exercise program that you develop must:

- address the following fitness objectives:
 - Flexibility,
 - Cardiovascular (aerobic) endurance, and
 - Muscular fitness.
- include at least three 30 minute or longer exercise sessions per week, with each session consisting of a warm-up, conditioning period, and a cool-down.
- be based on safe training principles and must be designed to either promote progressive improvement or to maintain a given fitness level.

TRAINING FOR PHYSICAL FITNESS

This section provides a discussion of how the principles of conditioning are applied in fitness programs designed to meet the stated objectives.

Training for Cardiovascular Fitness

Cardiovascular fitness is the most important health-related component of physical fitness. It is important in the prevention of many diseases and the promotion of good health. It is estimated that only 10 to 20 percent of the adult population exercises vigorously enough to promote cardiovascular fitness.

Some of the benefits of cardiovascular fitness training are:

- 1) An improved and strengthened cardiovascular system. The heart really benefits from regular aerobic exercise. Like any other muscle, the heart responds to training by increasing in strength and size. As the heart gets stronger, it can produce a more forceful contraction with each beat. This allows it to rest longer between beats, which results in a lowered resting heart rate.
- 2) A decrease in recovery time. Cardiovascular fitness training allows quicker recovery to resting values following an exercise session. This will carry over to your everyday life, and you will find yourself recovering much more quickly from other physical tasks.
- 3) Healthy blood. Cardiovascular fitness training tends to increase the good blood cholesterol, high density lipoproteins (HDL).

The fitness factors previously discussed on pages 6-8 are very important when designing a cardiovascular fitness training program. Let's see how they apply:

Frequency. Research indicates that training less than 2 days per week does not produce improvement in fitness. As a general rule of thumb, 3 days per week is recommended for aerobic training. The amount of improvement tends to plateau when frequency is increased to greater than 3 days per week, although this may be appropriate for more fit and exercise tolerant individuals. Again, 3 days per week is recommended.

Intensity. According to physiologists, the intensity of exercise must be adequate for a training effect to take place. Training below an adequate intensity level is unlikely to produce a training benefit. On the other hand, an excessively high training intensity is counterproductive, often leading to injury.

For cardiovascular exercise, the appropriate intensity is usually based on measurement of the heart rate during exercise. This is based on the fact that oxygen uptake and heart rate are related to each other in normal, healthy individuals. Since it is very difficult to directly measure oxygen uptake under field conditions, the training heart rate zone is used as a guideline to assure that the intensity of exercise is sufficient to produce a training effect in the working muscles and cardiovascular system.

Based on existing evidence compiled by the American College of Sports Medicine, each individual's training heart rate zone (training intensity) is between 60 to 80 percent of his/her maximum heart rate. Training intensity below 60 percent of maximum heart rate produces less than optimum benefit, while training intensity above 85 percent produces very little additional benefit over that achieved by training within the 60-80 percent zone. The procedure for determining your training heart rate zone based on maximum heart rate is presented in attachment H.

If you are beginning an exercise program, it is advisable to start out at the lower end of the range, i.e., near 60%. As you become more used to regular exercise, you can increase the intensity gradually.

Even as you adapt and become more used to exercise, you can use the training heart rate range to adjust the intensity on any given day. We all have days where we seem to have a little less energy than normal. On those days, lighten up by exercising at the low end of your training heart rate range. Don't skip exercising that day, just take it a little easier. If you exercise at your 60% threshold, you will still be providing your body with a good training intensity.

Also it's a good idea to practice counting your pulse at rest. Once you've mastered this, then practice counting your pulse when it's elevated. Be aware, however, that exercise is not the only thing that can elevate your pulse. Strong emotion, for example, will also elevate your heart rate. Practice checking it at these times too. (Unfortunately, you do not get the same cardiopulmonary benefits from this type of heart rate elevation!)

Time. Evidence indicates that the duration of continuous aerobic activity can be anywhere from 20 to 60 minutes or longer depending upon the "intensity" of the activity. Because the "total fitness" effect is more readily attained in longer duration programs, and because of the potential for overuse injuries in high intensity activity, lower to moderate intensity activity of longer duration is preferred for adult non-athletes. However, the evidence also indicates that "beginning" joggers tend to incur increased foot, leg, and knee injuries when training is performed more than three days per week for longer than 30 minutes duration per session.

The amount of time spent in the conditioning phase is very important. It is generally recommended that you spend at least 20 minutes in your training heart rate range. Thus, if you warm-up for 10 minutes, jog for 20 minutes, and cool down for 10 minutes, you will have spent a total of 40 minutes exercising.

As you grow more accustomed to regular aerobic exercise, it is recommended that you increase the time spent in the training heart rate range beyond 20 minutes, to 30-60

minutes. This has two benefits: 1) it will additionally benefit your cardiovascular system, and 2) you will burn more calories, which is important for weight control.

Pre-training fitness status. Your initial level of fitness is another important consideration in cardiovascular training. Individuals with low fitness levels can get significant training effects with a sustained training heart rate as low as 110-120 beats per minute, while persons at higher fitness levels need a higher threshold of stimulation. This means that you should not expect to be able to keep up with individuals with a higher capacity, and you should not slow down so that persons with lower capacity can keep up with you -- to do so will probably result in a deconditioning effect.

Type of Exercise. The type of exercise you choose is also very important. To improve cardiovascular fitness, you should choose activities which use large muscle groups in a rhythmical, continuous manner. Good examples are cycling, running, power walking, aerobic dancing, rope jumping, fitness hiking, and cross country skiing.

Enjoyment. Choose exercises that you enjoy and be willing to introduce variety into your workout schedule.

Specific Cardiovascular Fitness Training Activities

Several activities are excellent for the development of cardiovascular fitness. Generally, activities that enhance cardiovascular fitness are also the most beneficial for improving body composition. Some of the more popular activities are discussed in attachment I.

Training for Muscular Fitness

It is becoming increasingly apparent that muscular fitness training is important for a number of reasons. More and more research is indicating that it is necessary to maintain lean (muscle) tissue as we grow older. Resistance training is very effective in maintaining muscular fitness throughout life.

Some of the benefits of muscular fitness training are:

1. Improves posture.
2. Improves appearance by toning and shaping muscles.
3. Increases lean tissue/body fat ratio.
4. Aids in the prevention of injuries.
5. Improves physical performance.

Resistance training to improve strength and endurance involves the application of the overload principle in which muscles are subjected to a greater than normal level of stimulus. By adapting to the increased workload, the muscles increase in strength and work capacity.

The exercises you choose will depend upon the type of facilities and equipment that are available to you. If you are a member of an athletic health club, you probably have access to a wide variety of resistance weight machines, e.g., Nautilus, Universal, etc., and free weights. Use of this type of equipment probably produces the greatest strength gains.

If you do not have access to an athletic health club or other facility, calisthenic exercises can be used to develop muscular fitness. Generally speaking, weight training is the superior form of exercise for building strength, while calisthenic exercises tend to emphasize muscular endurance.

The critical training variables for the development of muscular fitness concern the number of repetitions and sets performed, the resistance used, and the order of the muscles used. Let's look at each of these factors:

Number of repetitions: The number of repetitions performed in a given set should be determined by your training emphasis. If you wish to improve strength, fewer repetitions, with heavier weights should be employed. If you wish to improve muscular endurance, more repetitions using lighter weights should be employed.

Eight to twelve repetitions to temporary muscle failure (see below) are recommended for improving both muscular strength and muscular endurance.

Resistance. This is the amount of weight that is being lifted. To develop strength, heavier weights should be lifted. To improve endurance, lighter weights should be lifted. Once the number of repetitions has been established, select the weight that will produce temporary muscle failure on the final repetition. "Temporary muscle failure" (TMF) is defined as "inability to complete another repetition with proper form and technique." TMF should occur between 8 and 12 repetitions to build strength. If you can perform more than 12 proper repetitions at a given weight, increase the amount of weight lifted. If you cannot perform 8 proper repetitions, decrease the weight.

Number of Sets. One group of repetitions for a particular exercise is referred to as a set. Two to three sets of each exercise are recommended, with no more than a 45 second rest between sets.

Order of Muscles Used. It is very important in the selection of weight training exercises to choose at least one exercise for each major muscle group and to perform the exercises in an order that uses the large muscles before the smaller muscles. The following series of exercises is a good example of a well balanced weight program:

Perform 2-3 sets of 8-12 repetitions of each of these exercises (see attachment J for illustrations):

- | | |
|--------------|-----------------------|
| <u>First</u> | 1. Leg press |
| | 2. Bench press |
| | 3. Knee extension |
| | 4. Lat pull down |
| | 5. Hamstring curl |
| | 6. Triceps push-down |
| | 7. Abdominal crunches |
| <u>Last</u> | 8. Biceps curl |

Here are some additional tips for starting a weight training program:

Progression and overload. In weight training, it is important to remember the concept of overload. As you become stronger, the weight you use should be increased. As you perform 8-12 repetitions to temporary muscle failure, you will notice that you must continue to increase the weight necessary to reach temporary muscle failure as you become more fit. This is a healthy sign that your muscles are responding to the exercise!

Proper breathing. It is very important to breathe properly during muscular effort. It is generally recommended to exhale as the weight is lifted or pushed and inhale as the weight is lowered or returned to the starting position. Never hold your breath.

Proper posture and technique. It is critically important to use good posture and technique while weight training. Generally, you should move only the body part that is the target of the specific exercise; e.g, do not use your back muscles to "help" with bicep curls. Concentrate on proper lifting technique. If you cannot maintain proper form while performing the final repetitions in a set, STOP -- most injuries that occur during weight training are caused by improper form.

Stretch and warm-up. Always warm-up properly before strength training, and be sure to include stretches that address the muscle groups that will be exercised.

Get advice. If you are unsure about starting a weight training program, seek advice. Most athletic health clubs have professional trainers that can help you get started, and your fitness coordinator will have a reference list of books, magazine articles, etc.

Specific Calisthenic Exercises

Recommended calisthenic exercises include push-ups, abdominal crunches (instead of sit-ups, which can place stress on the low back), pull-ups, arm lifts and leg lifts. Illustrations of the calisthenic exercises used in basic academy training are provided in attachment K.

Training for Flexibility

Flexibility is defined as the range of possible movement in a joint or series of joints. Maintenance of flexibility of the lower back and legs can be a significant factor in the prevention of one of the most prevalent medical problems in the U.S. -- low back pain. In addition, maintenance of flexibility in all joints helps prevent muscular and joint injury during exercise.

Inherent factors affecting flexibility in any joint include the bony structure of the joint itself, the bulk of the muscle close to the joint, the normal tension or "habit length" of the surrounding muscles, the pliability of connective tissue, and the structure of the ligaments and tendons.

Flexibility is influenced to a great degree by how we use our body. Muscles, tendons and joints which are frequently used tend to move freely through their full range of motion, while those which are not used (or used infrequently) tend to shorten, and lose pliability. Thus, to become more flexible, we need to frequently use our muscles, limbs, joints, etc., through their full range of motion. The best way to accomplish this is through stretching.

The following principles are useful when designing a flexibility program:

Use slow, gradual stretches. Emphasize stretching slowly and holding the stretch for 20 to 30 seconds. Stretch to the point of perceived tightness, not pain. If the stretch is painful, back off.

Repeat each stretch 2-3 times. Each time you should be able to go a little farther.

Warm-up first. Warm muscles are much more responsive to stretching than cold muscles. Engage in some light activity prior to stretching. Many people do their major stretching after the conditioning period, when the muscles are really warmed up.

Do not hold your breath. As with any exercise, do not hold your breath while stretching.

Stretch around all the major joints. Select good stretching exercises for the shoulders, trunk, hips, knees, ankles and neck.

When to Stretch

A perfect time to stretch is before and after a workout session.

Stretching before exercise prepares the muscles for exercise and helps reduce the likelihood of muscle injury.

Stretching after exercise, when blood is circulated to the muscles and they are warm, will facilitate the greatest improvements in flexibility.

Stretch anytime you feel like it (i.e., at work, while watching TV, when you feel stiff, first thing in the morning, etc.).

If you don't have much time, stretch for 5 minutes every 3-4 hours to help you feel good throughout the day.

Consistency is the key to improvement. Stretch regularly for best results!

How to's of Back Care Stretches

Don't do too much, especially in the beginning. Work within your own limits, and don't compare yourself to others. Stretch to the point of mild muscular tension and hold it. The tension should subside as you hold the stretch.

As mentioned previously, pain is NOT part of stretching. If you feel pain, you are stretching too far, or your positioning is incorrect. Ease off, change your positioning or ask someone to evaluate your technique.

DO NOT BOUNCE! This tightens the very muscles you are trying to stretch. Stretch slowly and hold it. (This applies to all stretches.)

Breathe slowly, deeply and naturally. **DON'T HOLD YOUR BREATH!**

RELAX, ENJOY and FEEL GOOD ABOUT YOURSELF!!!

Specific Flexibility Exercises

A number of recommended stretching exercises are provided in attachment G.

NUTRITION

Nutrition has a major impact on cardiovascular health and physical fitness. All movements of your body require food as a source of fuel. Like a car, your body will not function properly without a well-balanced mixture of fuel.

Unfortunately, a great many myths exist about the nutritional needs of physically active people.

Please take the following test about nutritional facts and fallacies. Answer each question as True or False.

Nutritional Myth Test

1. T or F Active people require more protein to improve their ability to exercise.
2. T or F Restricting fluid intake is recommended during training.
3. T or F Salt tablets are beneficial for replacing sodium lost in sweat.
4. T or F Eating foods high in sugar before exercise is a source of quick energy.
5. T or F A steak or a large hamburger is a nutritious pre-game meal.
6. T or F Exercise significantly increases appetite and is not beneficial for weight reduction.
7. T or F Physically active people do not need to follow the American Heart Association's recommendations for a cholesterol-lowering diet because exercise burns cholesterol.

All of these statements are FALSE. If you marked any of them as true, you need an update on nutrition. Even more critical, if you are actually practicing any of these misconceptions, you need to stop and re-evaluate your lifestyle. Attachment L contains a primer on nutrition which covers proper dietary considerations, tips on how your diet can maximize athletic performance, and general advice on consuming a healthy diet.

MANAGING BODY COMPOSITION

Many people tend to get fatter with age. There are several reasons for this. First, your body's metabolism (the rate at which you utilize food as energy) slows down some time after about age 25. This means that your body requires less food for the same amount of daily activity. Second, most people find that as they get older they are also less active. At work, you may be a supervisor or manager and find yourself doing less physical work. Leisure-time activities may also become less active. This decreases the amount of food your body requires for energy. Third, and finally, most people do not

adjust their food intake to account for the decreased energy demands of the body. Over time this leads to increased body fat and what is typically called "creeping obesity." If you gain one pound of fat per year starting at age 25, by the time you are 60 years old you will be 35 pounds overweight!

What can you do to prevent this problem or to help decrease body fat if you find that you are currently overfat? The first thing to understand is that you did not become overfat in one week or even in one month, so do not expect to get rid of your excess fat that quickly. Crash diets are not only dangerous because they nearly always deprive the body of essential nutrients, but they are also ineffective. Most people quickly regain any weight they lost as soon as they stop dieting. These people find themselves on a sort of dieting roller-coaster all of their lives.

The most effective way to decrease body fat and maintain ideal body weight is to combine regular endurance (aerobic) exercise with moderate caloric (food) intake.

For example, one pound of fat equals approximately 3,500 calories. If you decrease your caloric intake or increase your caloric expenditure by 500 calories per day you will lose one pound of fat in a week (seven days times 500 calories equals 3,500 calories -- one pound). One to two pounds a week is the ideal rate of loss.

Now, 500 calories may seem like a lot, but if you divide it between a little more exercise and a little less food, it doesn't seem so bad. First, you can increase your energy expenditure by 200 calories per day. One mile of brisk walking or jogging uses about 100 calories. Two miles of brisk walking would take 30-40 minutes and use up about 200 calories. Keep in mind that if you are walking up and down hills or on rough terrain you will use slightly more calories. Next, you can decrease your food intake by 100 calories per meal. This is not very much. A chart that contains the calories used per minute of exercise for various fitness activities is shown on page 17. Some examples of food with about 100 calories are shown in the table on page 18.

Not only is this technique of combining endurance exercise with moderate food intake an effective way to decrease body fat, but studies have shown that it is nearly impossible for a formerly overfat person to maintain goal weight without participating in regular aerobic exercise.

Most men lose an average of one to two pounds a week by consuming 1500-1800 calories a day; most women lose this amount by consuming 1200-1500 calories a day.

To maintain your body weight, multiply the number of pounds you weigh by 15 calories. This number represents the average number of calories expended in one day by a moderately active person of your weight.

If you're sedentary or get very little exercise, multiply your weight by 13 instead of 15. Less active people burn fewer calories.

Remember this: 1 gram of fat equals 9 calories, while 1 gram of carbohydrate or protein equals about 4 calories. Thus, fat is much more costly from a caloric standpoint. Avoid fried foods

and foods containing large quantities of "hidden" fat, e.g., muffins made with butter and oil: Read attachment L.

Here are some tips to help reduce your caloric intake:

Problem: Overeat at mealtime

Eat smaller portions and put away extra food so seconds are not readily available.

Work on strategies aimed at slowing down the act of eating:

- Cut food into smaller pieces
- Put fork down between mouthfuls -- swallow all food from each bite before refilling fork
- Sip ice water frequently during meal
- Gradually try to extend the time between bites -- slow down and really become aware of the taste and texture of food
- Set a goal to be the last one done; eat only what is on the plate -- no seconds

Get up from the table immediately when finished -- don't linger. Do something to keep busy to avoid the temptation to eat more.

Serve beverage in another area to change the setting and the habit, or save dessert and beverage for late evening snack.

Substitute low-calorie fruit, plain cakes or cookies for rich desserts.

Brush teeth or eat an artificially sweetened mint immediately after dinner as a signal that eating has now ceased.

ENERGY EXPENDITURE IN SELECTED FITNESS ACTIVITIES (Calories per minute)						
ACTIVITY	Body Weight (lbs)					
	110	130	150	170	190	210
Badminton	4.9	5.7	6.6	7.5	8.3	9.2
Basketball	6.9	8.1	9.4	10.6	11.9	13.1
Canoeing (leisure)	2.2	2.6	3.0	3.4	3.8	4.2
Circuit training	9.3	10.9	12.6	14.2	15.9	17.6
Cycling (9.4 mph)	5.0	5.9	6.8	7.7	8.9	9.5
Rowing (moderate)	7.4	8.7	10.0	11.3	12.6	13.9
Dancing (vigorous)	8.4	9.9	11.4	13.4	14.4	16.0
Aerobic dance (moderate)	5.4	6.4	7.3	8.3	9.3	10.3
Field hockey	6.7	7.9	9.1	10.3	11.5	12.7
Golf (no cart)	4.3	5.0	5.8	6.5	7.3	8.1
Running (9.3 min/mile)	9.7	11.4	13.1	14.9	16.6	18.3
Running (6.3 min/mile)	13.9	15.6	17.3	19.1	20.8	22.5
Skiing, X-C (moderate)	6.0	7.0	8.1	9.2	10.2	11.3
Squash/racquetball	10.6	12.5	14.4	16.3	18.2	20.1
Swimming (crawl, slow)	6.4	7.2	8.7	9.9	11.0	12.2
Tennis	5.5	6.4	7.4	8.4	9.4	10.4
Volleyball	2.5	3.0	3.4	3.9	4.3	4.8
Walking - flat (moderate)	4.0	4.7	5.4	6.2	6.9	7.6

Problem: Eating In-between meals (snacking)

Substitute food low in calories: Keep a variety of raw vegetables handy -- all prepared so they are readily available when needed. Vegetables such as raw carrots or celery sticks, green pepper strips, fresh mushrooms, tomato wedges or cherry tomatoes, cauliflower buds, cucumbers -- serve plain or marinated or with a low calorie cottage cheese dip. Munch on plain crackers, rye-crisp, bread sticks, pretzels, unbuttered popcorn or dry cereal snacks, but take care to watch the amount.

Control environment: Keep stored food out of sight. Remove food from living areas so it is not readily available when the impulse to snack develops. Store high-calorie snacks in back of cupboards or refrigerator, so they will not be visible at first glance. Place suitable snacks in front where easily reached. Request others not to offer food. Create situations where awareness of eating becomes apparent.

EXAMPLES OF FOODS WITH APPROXIMATELY 100 CALORIES

BREAKFAST

Bacon	3 slices fried crisp
Sausage	2 small links
Hashbrowns	1/2 cup homemade
Ham & Cheese Omelet	1/4 of 3-egg omelet
Pancakes	1 med. (4" diameter)
Waffle	1 frozen or 1/2 homemade
French Toast	2/3 slice
Croissant	1/3
Danish	2/3 roll
Bagel	1/2
Blueberry Muffin	1/2
Granola	1/4 cup
Jam, Jelly, Preserves	2 Tbsp
Butter, Margarine	1 Tbsp (3 pats)
Syrup	2 Tbsp
Cream Cheese	2 Tbsp

LUNCH / DINNER / FAST FOOD

Big Mac	1/6
Qtr. Pounder w/ch	1/6
Mc DLT	1/6
Jumbo Jack	1/6
Whopper	1/6
Carl Jr. Superstar	1/6
Small Hamburger	1/2
Small Cheeseburger	1/3
Fish Fillet Sandwich	1/4
Charbroiled Chicken	
Sandwich: Wendy's	1/3
Carl Jr.	1/3
Chicken McNuggets	2
Chicken Supreme	1/6
Fried Chicken - Drum	2/3
Fried Chicken - Brst	1/2
Taco Bell Taco	1/2
Bean Burrito	1/3
Pizza - Pepperoni	1/2 slice
Potato w/sour cr.	1/5
Chili	1/2 cup
Onion Rings	1/3 reg. order
French Fries	1/2 reg. order
Coleslaw	1/2 cup
Salad Dressing:	
1000 Island	1.5 Tbsp
Ranch	1.5 Tbsp
Blue Cheese	1.5 Tbsp
Italian	1.5 Tbsp
Mayonnaise	1.0 Tbsp

SNACKS / DESSERTS

Potato Chips	10
Black Olives	15 med
Cheese:	
Cheddar	1 oz
Swiss	1 oz
Jack	1 oz
American	1 oz
Crackers:	
Ritz	2
Saltines	4
Triscuit	2
Wheat Thins	3
Roasted Nuts	2/3 oz
Brownie w/nuts	1 (2" square)
Cupcake w/icing	3/4
Choc Cake plain	1" cube
Pumpkin Pie	1/2 small slice
Apple Pie	1/3 small slice
Vanilla Ice Cream	1/3 cup
Choc Shake	3 fl. oz
Hot Cocoa	1/2 cup
Chocolate Syrup	2 Tbsp
Milk Chocolate	2/3 oz
Chocolate Raisins	1 oz
Chocolate Chips	1/8 cup
Chocolate peanuts	2/3 oz
Jelly Beans	10

BEVERAGES

Lemonade	8 fl oz
Cola	8 fl oz
Fruit punch	8 fl oz
Juice	8 fl oz
Light Beer	12 fl oz
Reg Beer	8 fl oz
Wine	5 fl oz
Vodka	1.5 fl oz
Liqueur (coffee)	1 fl oz
Pina Colada	2 fl oz (1/3 reg size)

Delay the snack: When the desire for food appears, wait a predetermined time (a few minutes at first) before eating the snack. Progressively increase the length of time before each snack.

Pre-plan the snack to decrease the strength of impulse to eat: Better yet, plan to save a portion from a meal and use it as a snack.

Substitute another activity when urge to eat occurs: Controlling impulses to eat when hunger isn't really present will reduce caloric

intake without a feeling of being deprived or hungry.

Portion snack: Never take more than one serving at a time and put rest of food away.

After meal schedules: Moving the dinner meal to a later time may lessen the desire for evening snacks.

Find things to do that use the hands to keep from nibbling food: creative crafts, home repairs, gardening, exercising, even working crossword puzzles may serve as a substitute.

Change your normal habits to include hobbies and activities: Don't sit in front of the TV for hours on end -- take a class, exercise, learn a new hobby.

Problem: Unrealistic goals

Plan to lose no more than 1 to 2 pounds per week.

Use a combination of moderate food intake and regular aerobic exercise to reach your goal and stay there.

Learn the calorie content of foods you eat most often. Become a label-reader.

Allow yourself occasional indulgences. It is difficult to succeed if you feel constantly deprived.

Reward yourself for reaching your goals.

INJURY PREVENTION AND TREATMENT

Physical training has a certain degree of discomfort associated with it. However, the individual needs to be sensitive to early warning signs of "overuse" injury. Mottos such as "no gain without pain" and "you have to learn to run through pain," although well intentioned with respect to the accompanying discipline of physical training, are two-edged swords. A basic distinction must be made between the discomfort of exercise exertion and pain. Discomfort or transient distress is a natural phenomenon which can accompany exercise training. On the other hand, pain is symptomatic of a physiological disorder and should not be ignored, particularly if it persists through exercise and following exercise.

One objective of a conditioning program is to improve the physical capacities of the body and to experience the confidence and control that are associated with physical fitness. Overtraining leading to "overuse" injury is counterproductive to this objective.

This section discusses training injuries and what you can do to both prevent them and treat them if and when they occur.

Perceived Exertion During Exercise

When engaged in continuous activities such as jogging or intermittent activities such as circuit training, it is important to maintain a balance between the minimal exertion needed to cause a training stimulus and excessive exertion which can lead to prolonged fatigue or, in some cases, injury. We all need to acquire the knowledge necessary to effectively monitor our exercise level and understand the recovery indices that are necessary for sound physical training. If we apply this knowledge consistently, we can significantly reduce our risk of injury as well as the normal discomforts associated with training.

Respiration rate and pattern are the primary indicators of exertion. Exercise will raise the rate of breathing which is necessary for effective training; however, once you find that you are unable to voluntarily control the rhythm and pattern of breathing (i.e., you begin to pant) you should reduce the effort until controlled breathing is restored. This does not mean stop.

When exercising, it is natural to breathe in and out of both the nose and mouth.

Whenever dizziness or nausea are experienced, stop and walk until you recover. These symptoms may be associated with copious sweating and rapid heart rate. Under the latter circumstances, it is advisable to terminate exercise at once. If you have these symptoms, you should seek medical advice immediately.

If you experience "persistent" muscle pain, particularly in your legs, or joint pain during exercise, you may be experiencing "overuse injury." Under these circumstances you should stop the exercise and monitor the pain. If it disappears, the workout may be modified by engaging in an alternative type of exercise modality, e.g., stationary cycling could be substituted for a running activity.

Causes of Injury

Training injuries sometimes occur when people are engaged in exercise programs. Fortunately, the vast majority of such injuries are preventable. Understanding how they occur is more than half the battle in preventing them. With this in mind, it is instructive to note that the two most common causes of injury are totally within our control. They are:

Not paying attention to the environment (e.g., tripping on a rock, stepping in a pothole, etc.; or failing to maintain equipment properly, such as worn out running shoes).

Doing too much work (in terms of quantity or intensity) for your level of fitness and doing it too soon in your exercise program.

The important points here are

PAY ATTENTION, and

DON'T DO TOO MUCH TOO SOON.

Dealing With Injuries

Training injuries are categorized into 3 stages based on pain, when it occurs, and when it goes away. The degree of treatment you should seek (i.e., self-administered first aid/therapy vs. professional medical aid) can be determined by using these stages as a gauge:

1st Stage	Pain during the activity that goes away when activity ceases or soon after. Proper self treatment usually works well at this level.
2nd Stage	Pain during the activity that lingers on after the activity ceases, diminishes within a day or two, and is gone before next exercise session. Self treatment when recovery cycle is short. BUT, at this level it is time to start thinking about seeing a physician if the pain is not resolved within 3 - 4 days.
3rd Stage	Pain during the activity that does not go away even after days of rest (constant pain that impairs normal movement, pain that is distracting, perhaps keeps person awake at night). Medical attention should be sought immediately.
<p>EXCEPTIONS:</p> <p>Any loss of consciousness, any accident or fall where a limb or joint has to be immobilized, any heat-related injury or any case where one has chest pains and/or radiating pain down the left arm and/or difficulty in breathing SHOULD IMMEDIATELY BE BROUGHT TO THE ATTENTION OF A PHYSICIAN !!</p>	

You should not only be familiar with when to "self-treat" your injuries but also HOW to do so. The best and simplest advice is to use the "R. I. C. E." method:

R = REST: Cut way back or stop exercise altogether for 4 - 7 days. All training activity involving the injured area should temporarily cease.

I = ICE: Most therapists and sports medicine physicians today recommend ice (to minimize swelling and promote healing) for at least the first 72 hours after the injury; in fact, a growing number of physical therapists are recommending the use of ice throughout the injury cycle. Heat attracts blood and extracellular fluids to the injury, and the resultant edema (swelling) may retard recovery rate.

C = COMPRESSION: An elastic bandage around the injured area can reduce the dynamic forces causing the injury (e.g., shin splints) as well as prevent swelling. However, make sure "Ace Bandages" are not so tight that they cut off circulation.

E = ELEVATION: When and where possible, the injured area should be elevated to a position above the level of the heart to prevent unnecessary swelling due to fluid build up in the injured part. This should occur several times during the day.

Finally, you need to know what kinds of injuries commonly occur and what contributes to their development. Presented below is a brief list of some of the more common injuries and a note concerning cause and prevention of each:

Common Training Injuries

Pulled Hamstrings. (Muscle on back of thigh) Usually occurs during sprints, the result of explosively contracting a cold and tight muscle. Warm-up and stretch thoroughly prior to sprinting.

Groin Pull. Usually caused by using interior muscles to pull yourself over an obstacle (e.g., a wall), or running with the toes pointed outward. Point toes straight ahead on distance runs.

Side Stitch. The cause of the side stitch is unclear; some researchers feel that this syndrome is caused by food ingested too close to the exercise session; others feel that it is the result of a spasm or cramp in the diaphragm produced by abnormal breathing. Side stitches are frequently brought on due to poor warm-up or too early a fast pace. Relax abdomen when inhaling and contract abdomen when exhaling (like squeezing the air out); within 10 - 15 breaths the stitch will often disappear.

Muscle Soreness, Sprains, and Strains. Soreness, usually due to exercise after long inactivity, is caused by microscopic tears in the muscle or connective tissue, or by contractions of muscle fibers. It is almost impossible to avoid soreness when beginning an exercise program; however, it can be minimized by starting with moderate workloads and increasing those loads gradually and carefully. Beginners, as well as experienced exercisers, should stretch before and after work-out sessions.

Muscular soreness resulting from minor strains due to overexertion is experienced by every athlete occasionally. Mild soreness which appears gradually, eight to twenty-four hours after exercise, is of no serious concern and may be treated by simply reducing or eliminating the stress on the affected muscle for a few days. More intense pain, especially pain which appears suddenly during exercise, should receive prompt attention.

Whenever muscle or joint pain appears during a workout session, the activity should be discontinued immediately. Exercising through pain does no good from a training standpoint and is almost certain to further damage the involved area. Also, compensating for the injury while continuing a workout invites another injury in a different area of the body because of the abnormal stress. Ice should be applied to the injured area as soon as possible after the onset of pain. Avoid placing the ice directly against the skin--the pain resulting from

excessive chilling of the skin will limit the application time. Long term cooling of the injured tissue is the goal, not sudden and intense chilling of the skin surface. Paper cups filled with water and stored in the freezer are useful in the event of athletic injuries. Apply ice to the injury for twenty to thirty minutes, followed by a fifteen minute rewarming of the tissue. Repeat this process for three to four hours.

Light compression and elevation of the injured area will greatly aid in preventing the accumulation of fluid in the injured tissue. It is this accumulation of fluid--or edema--which prolongs the pain and retards the healing process.

If the pain and swelling increase despite the treatment, consult a physician. These symptoms may indicate that the injury is more serious than it first appeared. However, experts agree that ice as an initial treatment can do no harm and may be of great benefit, no matter how serious the injury.

Repeated muscle or joint soreness in the same area should not be ignored. Such chronic pain probably indicates inadequate or improper warm-up or stretching or incorrect exercise technique or equipment.

Muscle Cramps. Cramps are powerful involuntary muscle contractions. Immediate relief comes when the cramped muscle is stretched and massaged. Cold muscles seem to cramp more readily; therefore, it is always wise to warm up before vigorous effort.

Bone Bruises. Joggers sometimes get painful bruises on the bottoms of the feet. Such bruises can be avoided by careful foot placement and by using footwear of good quality. Cushioned inner soles also help. A bad bruise can linger, delaying an exercise program many weeks. There is no instant cure once a bruise has developed, so prevention is the best advice. Ice may help to lessen discomfort and hasten healing. Padding may allow exercise in spite of the bruise.

Ankle Problems. A sprained ankle should be iced and elevated immediately. An ice pack in the first few minutes may greatly reduce the

disabling effects of the sprain. A serious sprain should be examined by a physician. Ankle wraps and tape may allow exercise after a sprain, but prevention is a more prudent course.

Achilles Tendon. The Achilles tendon, which connects the heel to the calf muscle, is a notorious weak point in the human physiology. This tendon is easily injured in vigorous athletic activity. Careful stretching before and after exercise, and selecting good quality athletic footwear are both important in protecting this vulnerable tendon from injury. Once injured or inflamed, the Achilles tendon may take weeks or months to return to normal. An ice pack for about six minutes helps, but continued activity could lead to partial or complete rupture if left untreated or abused.

Lower Leg Pains (Shin Splints). Pain in the lower portion of the shin bone is known as shin splints. Although shin splints are usually a minor injury, the condition can, if not properly treated, become a chronic irritation which seriously interferes with training. Rest is the best cure for shin splints, although taping or a sponge heel pad seems to help in some cases. Preventive measures include exercises to strengthen shin muscles, gradual adjustment to the rigors of exercise, running on softer surfaces, occasionally reversing direction when running on a curved track, and using the heel-to-toe foot strike.

Blisters. Few people can say that they have never had a blister, but the likelihood of developing a blister can be reduced by wearing good, properly fitting shoes. At the first hint of discomfort, cover the area with some moleskin or a large bandage. If the blister does not reabsorb, and as a last resort, puncture the edge with a sterilized needle to drain the accumulated fluid, treat with an antiseptic, cover with gauze, circle with foam rubber, and go back to work. It is wise to keep the items needed for blister prevention on hand.

Knee Problems. The knee is one of the least efficient joints of the human body. If persistently abused, the knee is subject to several forms of injury and deterioration. The first line of defense against knee injury is strength. A knee which is supported by strong, well conditioned

muscles is stable and able to withstand stress better than a weak knee. Some athletic activities are particularly damaging to the connective tissue in the knee joint. The full squat, especially while supporting a weight, is a very dangerous exercise; the half squat is much safer. Injuries to the knee can also result from an activity as simple as running. In brief, careful strengthening of the knee and using proper exercise techniques and equipment are the most effective safeguards against injury. Persistent knee pain should never be ignored. If you experience knee discomfort you should see an orthopedic physician who is skilled in sports medicine.

Heat and Exercise

At moderate ambient temperatures the body heat generated by exercise or work is easily dissipated. As temperatures and humidity increase, the temperature-regulating mechanisms increase perspiration rate to keep the body temperature from climbing above tolerable limits (about 102.5°F). As perspiration evaporates, it cools the body. When humidity is high, perspiration does not evaporate, and less heat is lost. At that point excessive sweating only contributes to the problem. Perspiration comes from the blood and reduces blood volume. Also, salt and potassium needed by the cells are lost in perspiration. And finally, because perspiring also requires energy, excessive perspiration increases the body's exercise workload.

During work in the heat it is common to lose more than a quart of sweat an hour. During vigorous exercise in a hot, humid environment, sweat rates can approach three quarts an hour for short periods. A good estimate of fluid loss is the body weight difference after work in the heat. Athletes often lose six to eight pounds in a single workout. Adequate replacement of water, salt, and potassium is vital to maintain exercise or work capacity and to avoid heat cramps, heat exhaustion, or heat stroke.

The typical American diet, even when no salt is added to food at the table, contains many times more salt than the body can use under almost any workload. Therefore, for most people, no increase in salt consumption is necessary, and

such an increase may be harmful. Avoid the use of salt tablets. Exercise during warm, humid weather should be accompanied by increased fluid intake. Natural juices are beneficial because fruits and vegetables are excellent sources of the potassium and minerals which must be replaced. Note: This suggestion refers to real fruit juices, not juices which are artificially sweetened or flavored (read the label).

The body adjusts or acclimates to work in the heat. Gradual exposure to exercise in a hot environment leads to changes in blood flow, reduced salt loss, and increased perspiration. After five to seven days one's heart rate for the same amount of exercise may decline from 180 to 150 beats per minute. Physically fit individuals acclimate more readily to work in the heat, as their well-trained circulatory systems make them better suited to its demands.

Altitude and Exercise

Higher elevations impose limitations on work capacity because of reduced oxygen supply. During the first few weeks of exposure to higher altitude the ability to perform is impaired. It can be improved over a period of several weeks by training at that altitude. Altitude acclimatization leads to improved lung function, increased red blood cells and hemoglobin, and increased numbers of capillaries in the working muscles. These changes reduce but never eliminate the effect of altitude on aerobic capacity.

Air Pollution and Exercise

Avoid exercise in a polluted atmosphere. Carbon monoxide takes the place of oxygen in the red blood cells, which reduces aerobic capacity. Air pollution can, over the long term, have the following effects: 1) irritate airways (bronchitis), 2) break down air sacs in the lungs (emphysema), and 3) reduce oxygen transport.

The Air Resources Board has established the following criteria for ozone concentrations in the air:

- Stage 1 .20 ppm ozone
- Stage 2 .35 ppm ozone
- Stage 3 .50 ppm ozone

Strenuous physical activity should be avoided at Stages 1, 2 and 3, i.e., above .20 ppm ozone.

If you are in an area with high air pollution you may wish to consider using aerobic exercises which can be done indoors. Another option is exercising during the hours of lowest pollution, usually in the early morning.

Illness or Injury

A physical activity program should be modified or stopped during any illness, injury, or infection which might be aggravated by such a program. Use of proper footwear and socks and taking it easy at the beginning will help avoid many potential foot and leg problems. Remember that muscles condition much faster than do tendons, ligaments, and joints. Therefore, slow, gradual increases in exercise workloads are necessary to avoid injuries. Any persistent illness or injury should be brought to the attention of a physician. Never exercise with a fever!

BLOOD PRESSURE

What Is Blood Pressure?

Blood pressure -- everybody has it, and everybody needs it. In fact, without a certain amount of pressure in your vessels, your blood wouldn't circulate through your body. And without circulating blood, your vital organs couldn't get the oxygen and food that they need to keep functioning.

A person's blood pressure doesn't always remain the same, however. It changes constantly, varying from day to day and

moment to moment according to your body's needs. For example, your blood pressure will rise when you're exercising or you're excited, and will drop when you're resting or are asleep. Fluctuations are perfectly normal.

The beating of your heart pumps blood through large blood vessels called arteries that transport blood from your heart to other parts of your body. As your blood is pumped through your arteries, it pushes against the arterial walls. The force against the walls of the arteries is called blood pressure.

A healthy person's arteries are muscular and elastic. They stretch or contract when the heart pumps blood through them; the amount of stretching depends on the amount of force the blood exerts. Each time your heart contracts (about 60 to 80 times a minute under normal conditions), it sends a surge of blood into your arteries, and the blood pressure in your arteries increases. Conversely, when your heart relaxes between beats, your blood pressure decreases. From this, it follows that you really have two levels of blood pressure: an upper one when the heart is beating, and a lower one when your heart is resting. The higher reading is called the systolic pressure; the lower one, the diastolic pressure.

When your blood pressure is taken, both levels are recorded. For example, let's say your blood pressure reading is 124/80 (124 over 80). In this example the systolic reading is 124; the diastolic, 80. The numbers are calculated in millimeters of mercury and would be written as 124/80 mmHg.

These two numbers provide some very important information about the state of your health. The systolic pressure is important because it tells the maximum amount of pressure exerted on your arteries; the diastolic pressure is important because it tells the minimum pressure on your arteries. The harder it is for blood to flow through your blood vessels, the higher both numbers will be -- and the greater the strain on your heart.

If you're wondering whether there is an "ideal" blood pressure reading, the answer is "NO." Acceptable blood pressure falls within a range rather than being a particular pair of numbers.

For most adults, a blood pressure reading that is less than 140/90 mmHg indicates that there is no cause for worry.

What Is High Blood Pressure?

Arterioles, smaller vessels that branch off from the arteries, regulate a person's blood pressure. (The arteries, in turn, branch off from the aorta, the main artery from the heart.) To understand how the arterioles regulate blood pressure, think about how a nozzle regulates the water pressure in a hose. If the nozzle is wide open, it takes relatively little pressure to force the water through the hose, but if the nozzle is partially shut (or you clamp your thumb over the opening of the hose), the water pressure in the hose increases.

The same principle applies in your blood vessels. If for some reason your arterioles are narrowed, it becomes harder for the blood to pass through them. When that happens, the result is that your blood pressure rises and your heart works harder. If the pressure in your arteries increases to 145/95 (or more) and stays there, you have high blood pressure, also called "hypertension."

About 90% of the cases of high blood pressure have no known cause. This form of high blood pressure is called essential or primary high blood pressure. This program and this manual are concerned with primary high blood pressure. When high blood pressure has a specific cause, resulting for example, from a disease or physical problem, it is called secondary high blood pressure. Secondary high blood pressure is not discussed in this manual.

What Causes High Blood Pressure?

The reason(s) for primary (essential) high blood pressure is/are not yet known. Research scientists are trying to piece together answers to this mystery, however, and they're pursuing some important leads.

For instance, although researchers haven't discovered specific causes, they have learned of some factors that increase the chance that a person will develop high blood pressure. These predisposing factors include heredity, sex, age, obesity and sensitivity to sodium. Related factors that also seem to have some bearing on high blood pressure include heavy alcohol consumption, the use of oral contraceptives and a sedentary lifestyle.

A brief explanation of each of these factors follows.

Heredity. Experts who have studied high blood pressure have found that a tendency toward high blood pressure often seems to run in families. In other words, if your parents or other close blood relatives have/had high blood pressure, you are more likely to develop it than someone whose close blood relatives have/had normal blood pressure. If your family history indicates that close blood relatives have suffered strokes or heart attacks at an early age, or have/had high blood pressure, then you and other members of your family should take care to have your blood pressure monitored regularly.

Sex. Men are more likely to develop high blood pressure than women. After menopause, however, women's risk of high blood pressure increases.

Age. High blood pressure occurs most often in people over the age of 35. Men seem to have high blood pressure most often after age 35, while women are more likely to develop high blood pressure after age 45 or after menopause. In general, the older you get, the greater the chance that you will develop high blood pressure.

Obesity. Studies have shown that obese individuals (people whose weight is 20% or more above their ideal body weight) are more likely to develop high blood pressure. People who are overweight (less than 20% over their ideal body weight) tend to have high-normal to mild high blood pressure.

Sodium Sensitivity. Americans consume far more sodium than their bodies need. Heavy sodium consumption increases blood pressure in some people. As a result, many people who have been diagnosed as hypertensive are placed on restricted sodium diets.

Alcohol Consumption. Studies have shown that heavy, regular consumption of alcohol can increase blood pressure dramatically.

Oral Contraceptives. Women who take oral contraceptives may experience elevated blood pressure. The risk of developing high blood pressure is increased several times among women who take oral contraceptives and who also smoke cigarettes. When women who take oral contraceptives are also overweight, have had high blood pressure during pregnancy, or have a family history of high blood pressure, the risk of high blood pressure is also increased.

Sedentary Lifestyle. A sedentary, or inactive lifestyle tends to contribute to obesity, which is a risk factor for high blood pressure. Regular exercise helps to control weight and relieve anxiety.

Can You Tell When Your Blood Pressure is High?

No!! High blood pressure has no symptoms. In fact, many people have high blood pressure for years without knowing it. That's why it's so dangerous.

The only way to find out if you have high blood pressure is to have your blood pressure measured. You should have your blood pressure checked at least once a year.

TOBACCO USE

For years, the links between tobacco use and cancer (lung, and lip/mouth) and tobacco use and chronic lung disease have been well-documented. Although most people still associate tobacco use with respiratory

problems, this is not the whole story. Recent evidence indicates that the nicotine in tobacco is also a major cause of cardiovascular disease!!

Each year, nearly a million Americans die of heart attack, stroke, and other cardiovascular disorders. That's about one of every two deaths -- almost more deaths than from all other causes of death combined. And over 60 million Americans have some form of these potentially lethal diseases.

The bottom line is that about 350,000 deaths every year are attributed to tobacco use. And most of these deaths result not from cancer, but from heart attack.

Regardless of how much or how long you've used tobacco, when you finally quit, your risk of heart disease gradually decreases. Ten years after quitting, for example, your risk of death from heart disease is almost the same as if you'd never used tobacco.

It's important to stop using tobacco before the signs of heart disease appear. Once they appear, even if you quit, your risk of heart attack won't return to normal, although it will be lower. Don't wait until you have heart disease to quit.

CHOLESTEROL

What Is Blood Cholesterol?

Cholesterol is a waxy substance needed by all parts of the body to stay healthy. It is transported through the blood. The cholesterol in our blood comes from two sources: 1) our bodies make cholesterol daily; and 2) our diets contain cholesterol from animal food products, such as eggs, meats, and cheese. A problem arises when blood cholesterol levels get too high -- the cholesterol sticks to blood vessel linings, clogging blood flow the same way mineral deposits build up on water pipes. Clogged blood vessels lead to heart attacks -- the nation's leading cause of death -- and strokes.

Cholesterol is transported in our blood in several forms. Two of those forms are high density lipoproteins (HDL-cholesterol) and low density lipoproteins (LDL-cholesterol). HDL cholesterol is often referred to as "the good cholesterol" because it picks up the cholesterol from our arteries and carries it to the liver for digestion. LDL is called "the bad cholesterol" because it transports cholesterol from our liver back to our arteries for deposit. So, although it is desirable to have a total cholesterol value below 200 mg/dl, it is also important to have relatively high amounts of HDL cholesterol. Specifically, a ratio of at least 0.5 to 1 (HDL:LDL) is ideal.

Other factors besides high blood cholesterol can increase your risk of heart disease. Smoking, high blood pressure, being overweight, and a family history of heart disease are some of the leading risk factors. The more risk factors you have, the greater your risk for a heart attack. But you can do something to change many of these risk factors. High blood cholesterol is a problem YOU can solve.

Know Your Blood Cholesterol Level

If you haven't already done so, go to a physician, clinic, or other health care provider and have your cholesterol level analyzed. Compare your results with the chart below to determine if you are at risk for heart disease.

Total Blood Cholesterol (mg/dl)

Desirable	< 200
Borderline High Risk	200 - 240
High Risk	> 240

The higher your blood cholesterol level the greater your risk of death from heart disease. An estimated 50% of all adult Americans have high blood cholesterol, a major risk factor for heart disease. More lives are lost each year in the U.S. from heart disease than from any other cause.

If your blood cholesterol level is . . .

Desirable - Great! You should, however, get it rechecked every three years. Blood cholesterol levels change with time (usually getting higher), and can also fluctuate with changes in your diet and exercise habits. Also, your heart disease risk may continue to decrease as you decrease your cholesterol down to 150-160 mg/dl.

Borderline High Risk - See your physician within the month for another blood test to verify your value. Once your blood cholesterol is verified borderline high risk, you should begin dietary and lifestyle changes that can lower your blood cholesterol and risk for cardiovascular disease (see below).

High Risk - See your physician within the month for a recheck which will identify the various components of your total blood cholesterol value. This will aid in diagnosing and treating your blood cholesterol problem. Modifying your diet and making other lifestyle changes (see below) will also help lower your risk.

Steps to Lower Your Blood Cholesterol

Making changes in your diet and activity habits can lower your blood cholesterol and help you maintain a healthy heart:

Eating a diet that is low in fat (particularly saturated fat) is a key first step in controlling blood cholesterol. Diets that are high in saturated fats raise the level of blood cholesterol. Saturated fats are the solid fats found in animal products like meats, butter and cream. Saturated fats are also found in solid vegetable fats like shortening (hydrogenated oils) and tropical vegetable oils like coconut and palm oils. You can help lower your blood cholesterol by substituting other vegetable oils like olive, canola, safflower and corn oils for the saturated fats in your diet (in the foods you cook and in the prepared foods you buy).

Controlling dietary cholesterol, by limiting eggs to three per week and eating fewer high cholesterol foods (see below), may also lower blood cholesterol levels.

Foods to Avoid

Eating more foods high in soluble fiber -- oatmeal, oat bran, dried beans and fruit -- can lower blood cholesterol levels.

Controlling calories to maintain desirable body weight is also important in lowering blood cholesterol.

Maintaining a regular exercise program may increase the HDL component of your blood cholesterol.

Avoid foods high in saturated fats: whole milk dairy products (whole milk, butter, hard cheeses, cream, ice cream); luncheon meats; hard shortenings, lard and meats, particularly fatty or well-marbled cuts; snack crackers, chips and commercial baked goods made with hydrogenated vegetable shortenings, coconut or palm oils.

Avoid foods containing cholesterol: egg yolks and foods made with eggs; organ meats; whole milk dairy products.

Attachment L contains a good discussion of foods that are both high and low in cholesterol.

Make a heart-healthy substitution

Instead of

Try

Frying	Broiling, baking, steaming, or microwaving
Cooking with animal fats	Cooking with vegetable oils; olive, canola, or safflower
Cream, butter or white sauces	Broth or wine sauces
Cream or non-dairy creamer	Skim, 1%, or lowfat milk
Whole milk	Skim, 1%, or lowfat milk
Snack crackers or chips	Air-popped popcorn (plain)
Sour cream	Low or nonfat yogurt; cottage cheese
Pastries or doughnuts	Oatmeal or whole-grain cereal
Fast food burger lunch	Fast-food salad bar with low-cal dressing or vegetable-stuffed potato (request no butter or margarine)
Meat every day	Lean meat three times per week
Fried chicken	Skinless baked chicken
Fried fish	Broiled or poached fish

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ATTACHMENT A

**INFORMED CONSENT TO PARTICIPATE IN
A PHYSICAL FITNESS PROGRAM**

Physical Fitness Program Description

This program was developed by POST and is based upon current principles of exercise science. The program is voluntary. The purpose of the program is to encourage officers to achieve and maintain exemplary levels of health and physical fitness.

The program is anchored by a battery of fitness tests which are administered by a local fitness coordinator. Before beginning the program, all participants must sign an Informed Consent form and then complete a pre-screening risk appraisal which is comprised of an exercise readiness questionnaire and an assessment of resting heart rate and blood pressure. If indicated by the pre-screen, individuals are deferred from the program until cleared to participate by a physician.

Following successful pre-screening, each participant must complete a test battery consisting of measures of Percent Body Fat, a 1.5 Mile Run (or a 3 Mile Walk), a Sit and Reach Test, Push-Ups, Bent-Knee Sit-ups, and a Paper-and-Pencil Test covering important health concepts, including the actual construction of a personal exercise plan which the participant is expected to implement and maintain.

Prior to assessment, each participant is provided a copy of the POST In-Service Physical Fitness Program Officer's Manual, which contains a complete description of all program components including all material covered in the paper-and-pencil test.

Scores on the fitness test battery as well as the participant's status with regard to tobacco use and cholesterol level serve as the fitness standard through which awards are bestowed. These awards and their associated criteria (which are based on the norms for one's age and gender) are as follows:

Recognition Level	Total Points*	In addition to the required point totals, participants must know their cholesterol levels and must meet the criteria shown below.
Bronze	300	Scores on 3 tests at or above the 60th percentile; no scores below the 50th percentile.
Silver	350	Scores on 4 tests at or above the 70th percentile; no scores below the 60th percentile. No tobacco use in the last 2 months.
Gold	400	Scores on 4 tests at or above the 80th percentile; no scores below the 60th percentile. No tobacco use in the last 12 months.
* Points = Sum of percentiles (e.g., 80 points for achieving the 80th percentile, 90 points for achieving the 90th percentile, 55 for the 55th percentile, etc.; points are summed across all 5 tests; percentiles are in five percent (5%) increments.)		

Awards earned in the program are valid for one year, at which time participants need to retest in order to maintain their fitness status. Participants may discontinue the program at any time. All information collected in the program will remain the property of the department.

ATTACHMENT B

PHYSICAL EXERCISE READINESS QUESTIONNAIRE

PHYSICAL EXERCISE READINESS QUESTIONNAIRE (PERQ)

Name: _____	Agency: _____
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For most people, physical activity should not pose any problem or hazard. PERQ has been designed to identify the small number of officers for whom physical activity might be inappropriate or those who should receive medical advice concerning the type of activity most suitable for them.

Many health benefits are associated with regular exercise, and the completion of PERQ is a sensible first step if you are planning to increase the amount of physical activity in your life.

Common sense is your best guide in answering these few questions. Please read them carefully and check YES or NO opposite each question.

<u>YES</u>	<u>NO</u>	
		Has a doctor said you have heart trouble, a heart murmur, or that you have had a heart attack?
		Do you frequently have pains or pressure -- in the left of mid-chest area, left neck, shoulder, or arm -- during or right after you exercise?
		Do you often feel faint or have spells of severe dizziness, or actually pass out?
		Do you experience extreme breathlessness after mild exertion?
		Has your doctor said your blood pressure was too high and is not under control?
		Has your doctor said you have bone or joint problems such as arthritis?
		Are you over 40 years old?
		Do you have any medical condition not mentioned above which might need special attention in an exercise program? (That is, a condition that would not prevent you from exercising, but one that the fitness coordinator should be aware of in case of an unexpected event -- such as insulin-shock for persons with insulin-dependent diabetes.)
		Are you aware of any medical reason why you should not participate in an exercise program?

If you answered YES to one or more questions	If you answered NO to all questions
<p>You must consult with a physician and obtain a clearance to participate in the In-Service Physical Fitness Program. Your fitness coordinator will give you a medical clearance form that must be completed by the physician. You must also provide the physician a copy of your completed PERQ.</p>	<p>If you answered PERQ accurately, you have reasonable assurance that you may safely participate in the program without first obtaining a medical clearance. <u>However</u>, if you have any questions or doubts about your readiness, consult your physician.</p>

I certify that I have answered the above questions accurately and to the best of my knowledge.	
Signature: _____	Date: _____

ATTACHMENT C

RISKO FORM

RISKO

A Cardiac Risk Assessment

Listed below are eight categories that pertain to the health of your heart. Select the number in each category that applies to you. If you don't know your blood cholesterol level, assume that it is less than 200 mg. which is the case for most college students of normal weight. You can estimate your risk by comparing your score with the risk table shown at the end of the test.

1. AGE	10 to 20 1	21 to 30 2	31 to 40 3	41 to 50 4	51 to 60 6	61 to 70 AND OVER 8
2. HEREDITY	No known history of heart disease 1	1 relative with cardiovascular disease over 60 2	2 relatives with cardiovascular disease over 60 3	1 relative with cardiovascular disease under 60 4	2 relatives with cardiovascular disease under 60 6	3 relatives with cardiovascular disease under 60 8
3. WEIGHT	More than 5 lbs below standard weight 0	Standard weight 1	5-20 lbs overweight 2	21-35 lbs overweight 3	36-50 lbs overweight 5	51-65 lbs overweight 7
4. TOBACCO SMOKING	Nonuser 0	Cigar and/or pipe 1	10 cigarettes or less a day 2	20 cigarettes a day 3	30 cigarettes a day 5	40 cigarettes a day or more 8
5. EXERCISE	Intensive occupational and recreational exertion 1	Moderate occupational and recreational exertion 2	Sedentary work and intense recreational exertion 3	Sedentary work and moderate recreational exertion 5	Sedentary work and light recreational exertion 6	Complete lack of all exercise 8
6. CHOLESTEROL OR PERCENT FAT IN DIET	Cholesterol below 180 mg. Diet contains no animal or solid fats 1	Cholesterol 181-205 mg. Diet contains 10% animal or solid fats 2	Cholesterol 206-230 mg. Diet contains 20% animal or solid fats. 3	Cholesterol 231-255 mg. Diet contains 30% animal or solid fats 4	Cholesterol 256-280 mg. Diet contains 40% animal or solid fats 5	Cholesterol 281-330 mg. Diet contains 50% animal or solid fats 7
7. BLOOD PRESSURE	100 upper reading 1	120 upper reading 2	140 upper reading 3	160 upper reading 4	180 upper reading 6	200 or over upper reading 8
8. SEX	Female 1	Female over 45 2	Male 3	Bald male 4	Bald short male 6	Bald short stocky male 8

YOUR TOTAL SCORE

Degree of risk

6 to 11 = Very low risk	26 to 32 = High risk
12 to 17 = Low risk	33 to 41 = Dangerous risk
18 to 25 = Average risk	42 to 60 = Extremely dangerous risk

Cardiac Risk Assessment Scale by Boyer, J.I.

ATTACHMENT D

PERSONAL FITNESS PLAN AND CONDITIONING GUIDELINES

PERSONAL FITNESS PLAN

Name: _____ Date: _____

WARM-UP/FLEXIBILITY

Describe your warm-up.

Sit and Reach Score: _____ Ins. --- Norm percentile = _____%

CARDIOVASCULAR ACTIVITY

Describe your aerobic activity including intensity, duration, frequency, type.

1.5 Mile run Score: _____ min _____ Sec. --- Norm percentile = _____%

MUSCULAR FITNESS ACTIVITY

Describe your muscular fitness activity including frequency, sets and reps.

No. Sit-ups: _____ --- Norm percentile = _____%

No. Push-ups: _____ --- Norm percentile = _____%

COOL-DOWN / FLEXIBILITY

Describe your cool-down

BODY COMPOSITION

Describe your body composition management activities, if any.

Percent Body Fat = _____% --- Norm percentile = _____%

See reverse for conditioning guidelines

I understand that to achieve the silver award I must not have used any tobacco products during the preceding 2 months, and to achieve the gold award, I must not have used any tobacco products during the preceding 12 months.

Signature: _____

CONDITIONING GUIDELINES

CARDIOVASCULAR CONDITIONING

Cardiovascular Conditioning Principles:

- F** **FREQUENCY** - A minimum of three days per week.
I **INTENSITY** - 60 - 80% of calculated maximum Heart Rate (Training Heart Rate).
T **TIME** - A minimum of 20 minutes up to a maximum of 60 minutes at Training Heart Rate.

HEART RATE TRAINING ZONE:
_____ (bpm) TO _____ (bpm)

BODY COMPOSITION MANAGEMENT GUIDELINES

- ☛ MONITOR YOUR CALORIC INTAKE
- ☛ AVOID SATURATED FATS
- ☛ AVOID FRIED FOODS
- ☛ EAT MORE FRUITS AND VEGETABLES
- ☛ READ FOOD PACKAGING LABELS
- ☛ DO AEROBIC EXERCISE 5-6 TIMES A WEEK FOR 45-60 MINUTES AT LOW END OF HEART RATE TRAINING ZONE

MUSCULAR FITNESS ACTIVITY

Weight Training Principles:

- F** **FREQUENCY** - 2-3 days per week. With the exception of the abdominals, do not work the same muscle group two consecutive days in a row.
- I** **INTENSITY** - 2-3 sets of each exercise with a minimum of 8 and a maximum of 12 repetitions per set. No more than a 45 second rest period between sets.
- R** **RESISTANCE** - The amount of weight lifted should be adjusted so that Temporary Muscle Failure (TMF) occurs between the 8th and 12th repetition (i.e., when no further repetitions can be performed with proper form).
- M** **MUSCLES** - All major muscle groups should be exercised, starting with the largest muscles and working down to the smallest.

Calisthenic Guidelines:

- FREQUENCY** - Up to five days per week.

SAFETY GUIDELINES

1. Always Warm-up and Cool-down before and after your workout.
2. Stretching exercises are a required part of your exercise program.
3. Keep equipment in good working order. Check it frequently.

CONSULTATION/APPROVAL

I have reviewed the proposed program with the submitting officer and have approved it for implementation.

Fitness Coordinator: _____ Date _____

ATTACHMENT E

PHYSICAL FITNESS TEST BATTERY PROTOCOLS

Body Composition Measures

Percent Body Fat (Skinfold Measurement)

Materials: Harpenden or Lange skinfold calipers

Procedures:

1. Instructions to participants: "This test estimates your percentage of body fat by measuring the thickness of the layer of fat beneath the skin at three different places."
2. Note: This procedure requires a relatively high level of technical proficiency or inaccuracies are likely to result. It is recommended that the person who takes the skinfolds be formally trained in skinfold measurement technique. If no one is so trained, this test may be omitted.

All measurements should be taken on the non-dominant side. Perform all three measurements once, then repeat all three again. Do not take the same measurement twice in a row. If the two measurements for any site differ by more than one millimeter, repeat the measurement. If necessary, continue to repeat the measurement until two measurements at the same site are within one millimeter. Record each measurement in the space provided on the POST Physical Fitness Test Battery Score Sheet.

When taking measurements, grasp skinfold between thumb and index finger so as to include two thicknesses of skin and subcutaneous fat but no muscle tissue. (Make sure that all skin and fat are pulled away from underlying muscle.) If in doubt regarding the presence of muscle tissue, ask person to contract muscle. Apply calipers approximately one centimeter above fingers. Hold calipers with slight inward pressure at a depth approximately equal to the thickness of the fold.

3. For males, take the skinfold measurements at the chest, abdomen, and thigh.
4. For females, take the skinfold measurements at the tricep, suprailiac (hip) and thigh.
5. The correct procedure for taking these skinfolds is illustrated in figures 1-5.

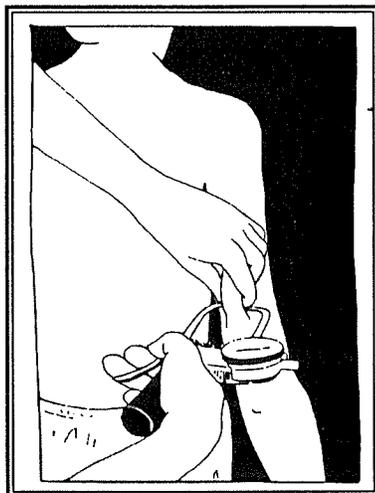


Figure 1 Tricep site
(Female only)

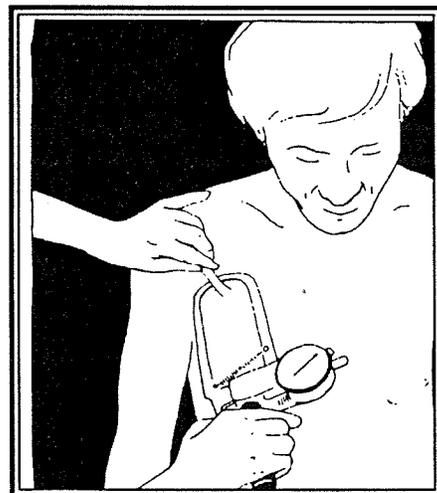


Figure 2 Chest Site
(Male only)

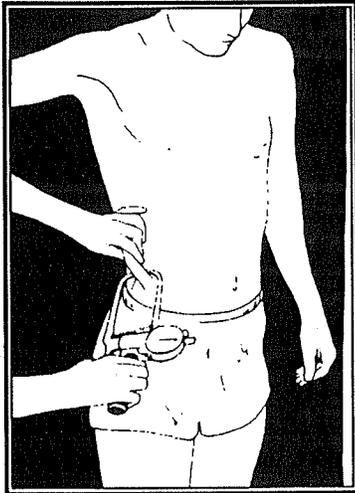


Figure 3 Suprailiac Site
(Female only)

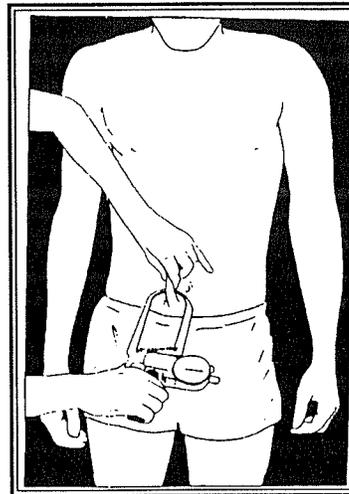


Figure 4 Abdomen site
(Male only)

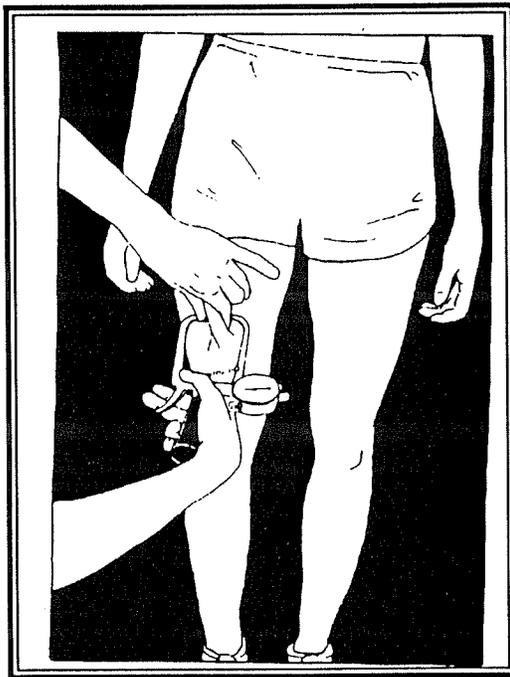


Figure 5 Thigh Site
(Male and Female)

6. Calculate percent body fat using the following tables for males and females:

First, calculate the sum of the three skinfold measurements (i.e., add up the chest, abdomen and thigh for males and triceps, suprailiac, and thigh for females) in millimeters.

Then, go to table A (for males) or table B (for females) and find the sum (mm) in the left-hand column. Look in the row across from the sum (mm) under the person's age.

Percent Body Fat equals the number that appears in the cell under the person's age and across from his/his sum of skinfolds (mm).

TABLE A: PERCENT BODY FAT CONVERSION TABLE FOR MALES

Estimation of relative body fat, by percent, in men from the sum of chest, abdominal, and thigh skinfolds (from Pollock, et al. 1980).

Age to Last Year Sum of Skinfolds (mm)	Under 22	23 to 27	28 to 32	33 to 37	38 to 42	43 to 47	48 to 52	53 to 57	Over 58
8-1	1.3	1.8	2.3	2.9	3.4	3.9	4.5	5.0	5.5
11-13	2.2	2.8	3.3	3.9	4.4	4.9	5.5	6.0	6.5
14-16	3.2	3.8	4.3	4.8	5.4	5.9	6.4	7.0	7.5
17-19	4.2	4.7	5.3	5.8	6.3	6.9	7.4	8.0	8.5
20-22	5.1	5.7	6.2	6.8	7.3	7.9	8.4	8.9	9.5
23-25	6.1	6.6	7.2	7.7	8.3	8.8	9.4	9.9	10.5
26-28	7.0	7.6	8.1	8.7	9.2	9.8	10.3	10.9	11.4
29-31	8.0	8.5	9.1	9.6	10.2	10.7	11.3	11.8	12.4
32-34	8.9	9.4	10.0	10.5	11.1	11.6	12.2	12.8	13.3
35-37	9.8	10.4	10.9	11.5	12.0	12.6	13.1	13.7	14.3
38-40	10.7	11.3	11.8	12.4	12.9	13.5	14.1	14.6	15.2
41-43	11.6	12.2	12.7	13.3	13.8	14.4	15.0	15.5	16.1
44-46	12.5	13.1	13.6	14.2	14.7	15.3	15.9	16.4	17.0
47-49	13.4	13.9	14.5	15.1	15.6	16.2	16.8	17.3	17.9
50-52	14.3	14.8	15.4	15.9	16.5	17.1	17.6	18.2	18.8
53-55	15.1	15.7	16.2	16.8	17.4	17.9	18.5	19.1	19.7
56-58	16.0	16.5	17.1	17.7	18.2	18.8	19.4	20.0	20.5
59-61	16.9	17.4	17.9	18.5	19.1	19.7	20.2	20.8	21.4
62-64	17.6	18.2	18.8	19.4	19.9	20.5	21.1	21.7	22.2
65-67	18.5	19.0	19.6	20.2	20.8	21.3	21.9	22.5	23.1
68-70	19.3	19.9	20.4	21.0	21.6	22.2	22.7	23.3	23.9
71-73	20.1	20.7	21.2	21.8	22.4	23.0	23.6	24.1	24.7
74-76	20.9	21.5	22.0	22.6	23.2	23.8	24.4	25.0	25.5
77-79	21.7	22.2	22.8	23.4	24.0	24.6	25.2	25.8	26.3
80-82	22.4	23.0	23.6	24.2	24.8	25.4	25.9	26.5	27.1
83-85	23.2	23.8	24.4	25.0	25.5	26.1	26.7	27.3	27.9
86-88	24.0	24.5	25.1	25.7	26.3	26.9	27.5	28.1	28.7
89-91	24.7	25.3	25.9	25.5	27.1	27.6	28.2	28.8	29.4
92-94	25.4	26.0	26.6	27.2	27.8	28.4	29.0	29.6	30.2
95-97	26.1	26.7	27.3	27.9	28.5	29.1	29.7	30.3	30.9
98-100	26.9	27.4	28.0	28.6	29.2	29.8	30.4	31.0	31.6
101-103	27.5	28.1	28.7	29.3	29.9	30.5	31.1	31.7	32.3
104-106	28.2	28.8	29.4	30.0	30.6	31.2	31.8	32.4	33.0
107-109	28.9	29.5	30.1	30.7	31.3	31.9	32.5	33.1	33.7
110-112	29.6	30.2	30.8	31.4	32.0	32.6	33.2	33.8	34.4
113-115	30.2	30.8	31.4	32.0	32.6	33.2	33.8	34.5	35.1
116-118	30.9	31.5	32.1	32.7	33.3	33.9	34.5	35.1	35.7
119-121	31.5	32.1	32.7	33.3	33.9	34.5	35.1	35.7	36.4
122-124	32.1	32.7	33.3	33.9	34.5	35.1	35.8	36.4	37.0
125-127	32.7	33.3	33.9	34.5	35.1	35.8	36.4	37.0	37.6

Percent fat calculated by the formula by Siri: Percent Fat = $[(4.95/BD) - 4.5] * 100$, where BD = Body density.

TABLE B: PERCENT BODY FAT CONVERSION TABLE FOR FEMALES

Estimation of relative body fat, by percent*, in women from the sum of triceps, suprailiac, and thigh skinfolds (from Pollock, et al. 1980).

Age to Last Year	23	28	33	38	43	48	53		
Sum of Skinfolds Under	to	Over							
(mm)	22	27	32	37	42	47	52	57	58
23-25	9.7	9.9	10.2	10.4	10.7	10.0	11.2	11.4	11.7
26-28	11.0	11.2	11.5	11.7	12.0	12.3	12.5	12.7	13.0
29-31	12.3	12.5	12.8	13.0	13.3	13.5	13.8	14.0	14.3
32-34	13.6	13.8	14.0	14.3	14.5	14.8	15.0	15.3	15.5
35-37	14.8	15.0	15.3	15.5	15.8	16.0	16.3	16.5	16.8
38-40	16.0	16.3	16.5	16.7	17.0	17.2	17.5	17.7	18.0
41-43	17.2	17.4	17.7	17.9	18.2	18.4	18.7	18.9	19.2
44-46	18.3	18.6	18.8	19.1	19.3	19.6	19.8	20.1	20.3
47-49	19.5	19.7	20.0	20.2	20.5	20.7	21.0	21.2	21.5
50-52	20.6	20.8	21.1	21.3	21.6	21.8	22.1	22.3	22.6
53-55	21.7	21.9	22.1	22.4	22.6	22.9	23.1	23.4	23.6
56-58	22.7	23.0	23.2	23.4	23.7	23.9	24.2	24.4	24.7
59-61	23.7	24.0	24.2	24.5	24.7	25.0	25.2	25.5	25.7
62-64	24.7	25.0	25.2	25.5	25.7	26.0	26.7	26.4	26.7
65-67	25.7	25.9	26.2	26.4	26.7	26.9	27.2	27.4	27.7
68-70	26.6	26.9	27.1	27.4	27.6	27.9	28.1	28.4	28.6
71-73	27.5	27.8	28.0	28.3	28.5	28.8	29.0	29.3	29.5
74-76	28.4	28.7	28.9	29.2	29.4	29.7	29.9	30.2	30.4
77-79	29.3	29.5	29.8	30.0	30.3	30.5	30.8	31.0	31.3
80-82	30.1	30.4	30.6	30.9	31.1	31.4	31.6	31.9	32.1
83-85	30.9	31.2	31.4	31.7	31.9	32.2	32.4	32.7	32.9
86-88	31.7	32.0	32.2	32.5	32.7	32.9	33.2	33.4	33.7
89-91	32.5	32.7	33.0	33.2	33.5	33.7	33.9	34.2	34.4
92-94	33.2	33.4	33.7	33.9	34.2	34.4	34.7	34.9	35.2
95-97	33.9	34.1	34.4	34.6	34.9	35.1	35.4	35.6	35.9
98-100	34.6	34.8	35.1	35.3	35.5	35.8	36.0	36.3	36.5
101-103	35.3	35.4	35.7	35.9	36.2	36.4	36.7	36.9	37.2
104-106	35.8	36.1	36.3	36.6	36.8	37.1	37.3	37.5	37.8
107-109	36.4	36.7	36.9	37.1	37.4	37.6	37.9	38.1	38.4
110-112	37.0	37.2	37.5	37.7	38.0	38.2	38.5	38.7	38.9
113-115	37.5	37.8	38.0	38.2	38.5	38.7	39.0	39.2	39.5
116-118	38.0	38.3	38.5	38.8	39.0	39.3	39.5	39.7	40.0
119-121	38.5	38.7	39.0	39.2	39.5	39.7	40.0	40.2	40.5
122-124	39.0	39.2	39.4	39.7	39.9	40.2	40.4	40.7	40.9
125-127	39.4	39.6	39.9	40.1	40.4	40.6	40.9	41.1	41.4
128-130	39.8	40.0	40.3	40.5	40.8	41.0	41.3	41.5	41.8

*Percent fat calculated by the formula by Siri: Percent Fat = [(4.95/BD) - 4.5] * 100, where BD = Body density.

Waist to Hip Ratio (Advisory only - not part of award criteria)

Materials: Spring tension measuring tape

Procedures:

1. Instructions to participants: "This test measures your body composition in terms of the pattern of subcutaneous fat distribution. The measurement is made by comparing your waist circumference to your hip circumference."
2. Demonstrate technique:

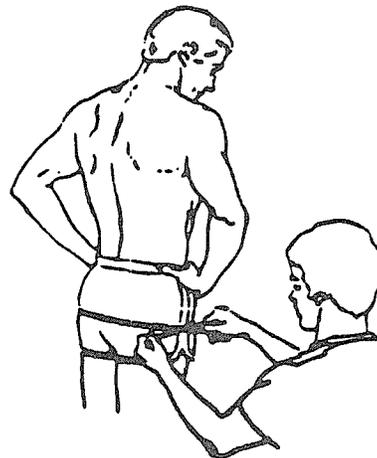
Waist (Abdominal) Girth

The participant stands erect. The assessor uses a cross-handed technique to position the tape horizontally at the level of noticeable waist narrowing. The tape is then placed in the recording position and the measurement is made at the end of a normal exhalation (breath). If there is no noticeable waist narrowing, take the measurement at the same level as the bottom of the rib cage when felt at the side. Be sure the tape is at the same horizontal level all the way around. Record the waist measurement on the POST Physical Fitness Test Battery Score Sheet.

Hip (Gluteal) Girth

The participant stands erect with feet together. The tape is positioned at the level where the hips are the largest (usually where the legs start) using the same technique as above, i.e., cross-handed technique to position the tape horizontally. Record the hip girth measurement.

After performing each measurement once, take each measurement a second time. Do not perform the same measurement twice in a row. If the two measurements (for either hip or waist) are greater than one (1) centimeter apart, repeat the measurement until two values are within 1 centimeter. Take the average of the two measurements which are within 1 centimeter of each other and record this value in the appropriate place on the Score Sheet.



Cardiovascular Measures

1.5 Mile Run

Materials: stopwatch, distance measuring device, traffic cones.

Setup: Measure a 1.5 mile distance, preferably on a track. Mark start and finish lines with traffic cones.

Procedures:

1. Instructions to participant: "This test measures your cardiopulmonary or aerobic endurance. You are to run the 1.5 miles as quickly as you can. This test will be administered once."
2. Position participant at the start line.
3. Set stopwatch to zero and start test with the commands, "Ready, go."
4. Clock and record time to the nearest tenth of a second.
5. Observe participant during cool-down. Encourage participant to walk around; discourage participant from lying or sitting down.

3 Mile Walk (alternative to 1.5 mile run)

Materials: stopwatch, distance measuring device, traffic cones.

Setup: Measure a 3.0 mile distance, preferably on a track. Mark start and finish lines with traffic cones.

Procedures:

1. Instructions to participant: "This test measures your cardiopulmonary or aerobic endurance. You are to walk the 3.0 miles as quickly as you can. This test will be administered once."

Do not run or jog. If you run or jog during this test, your trial will be disallowed and you will need to repeat the test at a later time."

2. Position participant at the start line.
3. Set stopwatch to zero and start the test with the commands "Ready, go."
4. Clock and record time to the nearest tenth of a second.
5. Observe participants during cool-down. Encourage them to walk around; discourage participant from lying or sitting down.

Flexibility Measure

Sit and Reach Test

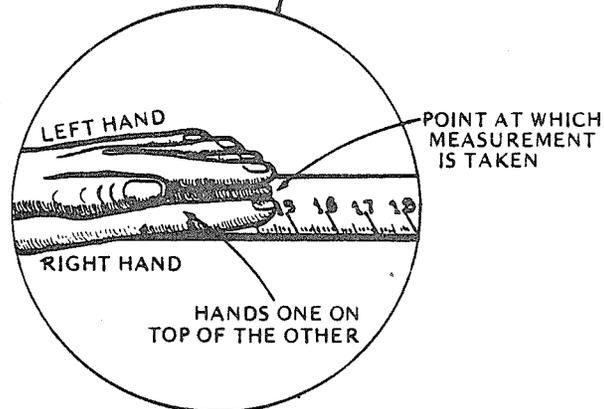
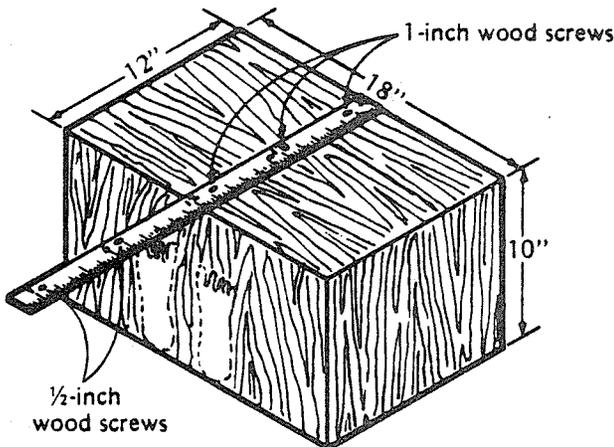
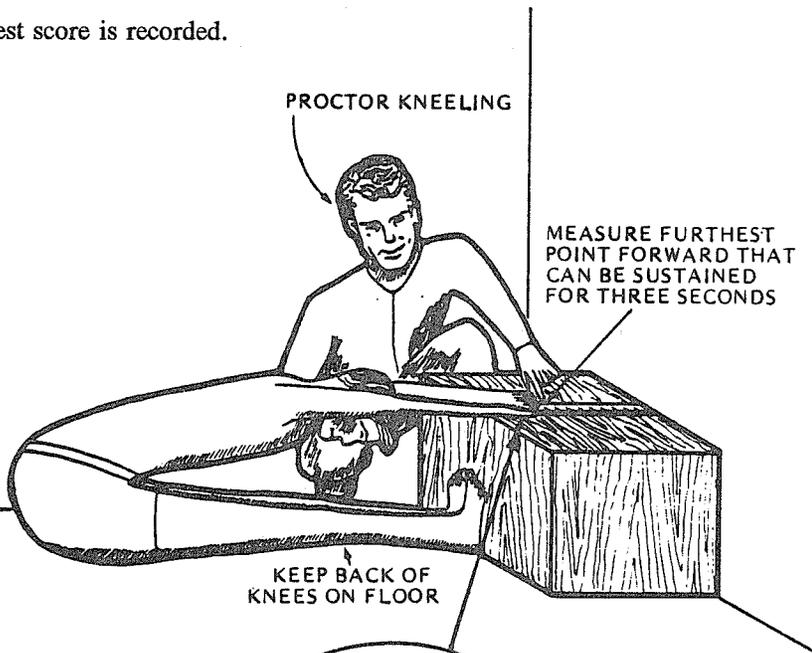
Materials: Sit and Reach Box (see diagram below for construction).

Procedures:

1. Instructions to participant: "This test measures the flexibility of the muscles in your lower back and hamstrings. You will be given three trials."
2. Instruct participants to remove shoes.
3. Demonstrate the procedure: (1) Legs are fully extended and the soles of the feet are placed flat against the Sit and Reach Box; (2) hands placed one on top of the other; (3) the arms are extended as far forward as possible in a smooth motion and held for a count of three (Do not lurch forward - move slowly); (4) the point at the tip of the fingers is recorded on the POST Physical Fitness Test Battery Score Sheet.
4. Guard against the participant's knees bending by keeping a hand on the knees to detect movement.
5. Caution the participant against bouncing or jerking forward.
6. Three trials are given. The best score is recorded.

MATERIALS

- 1/2" X 2" X 24" board
 - Yardstick or 2-foot ruler
 - 3 1-inch wood screws
 - 2 1/2-inch wood screws
 - Glue
 - 1 1/4-inch box nails
 - 1 1/2" X 12" X 18" plywood (top)
 - 1 1/2" X 10" X 18" plywood (front)
 - 2 1/2" X 10" X 12" plywood (sides)
- Box has no back



Muscular Fitness Measures

Push-Up Test

A PERSON WHO SUFFERS FROM LOWER BACK AILMENTS SHOULD NOT PERFORM THIS TEST.

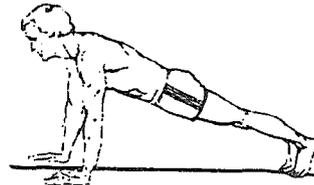
Materials: Gym mat

Procedures:

1. Instructions to participant: "This test measures the dynamic strength and endurance of the arm, chest, and shoulder muscles. You are to perform as many push-ups in proper form as you can. The test will be administered once."

2. Demonstrate the correct technique:

Males: (1) Lie on stomach, legs together; (2) position hands under shoulders and pointing forward; (3) Push up from the mat by fully straightening elbows and using toes as pivotal point; (4) keep upper body in a straight line, don't bend the back; (5) lower body to within two inches of the mat; neither stomach nor thighs should touch the mat

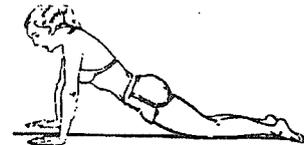


Females: (1) Lie on stomach, legs together; (2) position hands under the shoulders and pointing forward; (3) Push up from the mat by fully straightening elbows and using knees as pivotal point; (4) keep upper body in a straight line, don't bend the back; (5) lower body to starting position, chin touches the mat, the stomach should not touch the mat; (6) lower legs remain in contact with the mat, ankles straight (point toes).



3. Check for improper technique:

Males: (1) bending the back; (2) not lowering to within 2 inches of the ground.



Females: (1) bending the back; (2) not lowering chin to mat; (3) stomach touches mat.



4. Record the number of properly executed push-ups on the POST scoring form.

BENT-KNEE SIT-UPS

A PERSON WHO SUFFERS FROM LOWER BACK AILMENTS SHOULD NOT PERFORM THIS TEST.

Material: Gym mat, timer or stop-watch

Procedure:

The participant lies in a supine position, knees bent at a right angle, and feet shoulder-width apart. The hands are placed at the side of the head with the fingers over the ears. The elbows are pointed toward the knees. The hands and elbows must be maintained in these positions for the entire duration of the test. Also, the ankles of the participant must be held throughout the test by the appraiser to ensure that the heels are in constant contact with the mat.

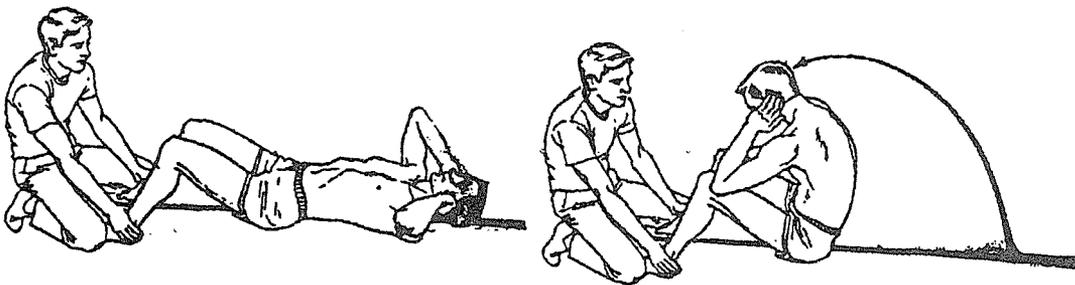
The participant is required to sit up, touch the knees with the elbows and return to the starting position (shoulders touch floor). THE PARTICIPANT PERFORMS AS MANY SIT-UPS AS POSSIBLE WITHIN ONE MINUTE. The participant may pause to rest whenever necessary.

It is imperative that the participant is well instructed in the correct performance of the sit-up. The participant should be informed to initiate the sit-up by flattening the lower back followed by actively contracting the abdominal muscles and then continuing the movement with a well-controlled "curling up" of the trunk to the point where the elbows touch the knees. This is followed by a "curling down" of the trunk with particular emphasis on the lower back fully contacting the mat before the upper back and shoulders touch the mat.

A "rocking" or "bouncing" movement is not permitted. Also, the participant's buttocks must remain in contact with the mat and the fingers in contact with the side of the head at all times. Have the participant practice one or two repetitions to check for proper technique.

Advise the participant that incorrect repetitions, those not meeting the above criteria, will not be counted. The participant should also be advised to avoid breath-holding by breathing rhythmically and to "exhale on effort; i.e., exhale during "curling-up" phase of the sit-up.

When the participant is fully informed of the preceding details and is ready to start the sit-up test, give the command, "Begin" and start the timer.



ATTACHMENT F

FITNESS TEST NORM TABLES BY GENDER AND AGE

PERCENT BODY FAT - FEMALES

		AGE				
AWARD	PERCENTILE	20-29	30-39	40-49	50-59	60+
	90	14.5	15.5	18.5	21.6	21.1
	85	16.0	16.9	20.3	23.6	23.5
GOLD	80	17.1	18.0	21.3	25.0	25.1
	75	18.2	19.1	22.4	25.8	26.7
SILVER	70	19.0	20.0	23.5	26.6	27.5
	65	19.8	20.8	24.3	27.4	28.5
BRONZE	60	20.6	21.6	24.9	28.5	29.3
	55	21.3	22.4	25.5	29.2	29.9
	50	22.1	23.1	26.4	30.1	30.9
	45	22.7	24.0	27.3	30.8	31.8
	40	23.7	24.9	28.1	31.6	32.5
	35	24.4	26.0	29.0	32.6	33.0
	30	25.4	27.0	30.1	33.5	34.3
	25	26.6	28.1	31.1	34.3	35.5
	20	27.7	29.3	32.1	35.6	36.6
	15	29.8	31.0	33.3	36.6	38.0
	10	32.1	32.8	35.0	37.9	39.3
	5	35.4	35.7	37.8	39.6	40.5
	1	>40.5	>40.0	>45.5	>50.8	>47.0

From: Cooper, K. The Aerobics Institute, Dallas, TX.

PERCENT BODY FAT - MALES

		AGE				
AWARD	PERCENTILE	20-29	30-39	40-49	50-59	60+
	90	7.1	11.3	13.6	15.3	15.3
	85	8.3	12.7	15.1	16.9	17.2
GOLD	80	9.4	13.9	16.3	17.9	18.4
	75	10.6	14.9	17.3	19.0	19.3
SILVER	70	11.8	15.9	18.1	19.8	20.3
	65	12.9	16.6	18.8	20.6	21.1
BRONZE	60	14.1	17.5	19.6	21.3	22.0
	55	15.0	18.2	20.3	22.1	22.6
	50	15.9	19.0	21.1	22.7	23.5
	45	16.8	19.7	21.8	23.4	24.3
	40	17.4	20.5	22.5	24.1	25.0
	35	18.3	21.4	23.3	24.9	25.9
	30	19.5	22.3	24.1	25.7	26.7
	25	20.7	23.2	25.0	26.6	27.6
	20	22.4	24.2	26.1	27.5	28.5
	15	23.9	25.5	27.3	28.8	29.7
	10	25.9	27.3	28.9	30.3	31.2
	5	29.1	29.9	31.5	32.4	33.4
	1	>36.4	>35.6	>37.4	>38.1	>41.3

From: Cooper, K. The Aerobics Institute, Dallas, TX.

WAIST-TO-HIP RATIO - FEMALES

		AGE				
AWARD	PERCENTILE	20-29	30-39	40-49	50-59	60+
	95	.65	.66	.66	.67	.71
	90	.67	.68	.69	.71	.73
	85	.68	.69	.71	.72	.74
GOLD	80	.69	.71	.72	.73	.75
	75	.71	.72	.73	.74	.76
SILVER	70	.72	.73	.74	.75	.77
	65	.73	.74	.75	.76	.78
BRONZE	60	.73	.75	.76	.77	.79
	55	.74	.75	.76	.77	.80
	50	.75	.76	.77	.78	.81
	45	.76	.77	.78	.79	.82
	40	.76	.78	.79	.80	.83
	35	.77	.78	.79	.81	.84
	30	.78	.79	.80	.82	.85
	25	.78	.80	.82	.84	.86
	20	.79	.81	.84	.85	.87
	15	.80	.83	.86	.86	.88
	10	.82	.85	.87	.88	.91
	5	.85	.87	.92	.92	.94

From: Canadian standardization Test of Fitness Operations Manual, Third Edition, 1986

WAIST-TO-HIP RATIO - MALES

		AGE				
AWARD	PERCENTILE	20-29	30-39	40-49	50-59	60+
	95	.76	.80	.81	.82	.84
	90	.80	.81	.83	.85	.88
	85	.81	.82	.84	.87	.89
GOLD	80	.81	.83	.86	.89	.90
	75	.82	.84	.87	.89	.90
SILVER	70	.83	.84	.88	.90	.91
	65	.83	.85	.89	.91	.92
BRONZE	60	.84	.86	.90	.92	.93
	55	.85	.87	.91	.92	.94
	50	.85	.88	.92	.93	.94
	45	.86	.89	.92	.94	.95
	40	.87	.90	.93	.95	.96
	35	.87	.91	.94	.95	.97
	30	.88	.92	.95	.96	.98
	25	.89	.93	.95	.98	.99
	20	.91	.94	.97	.99	1.00
	15	.93	.95	.99	1.01	1.02
	10	.94	.96	1.01	1.02	1.03
	5	.96	1.01	1.03	1.04	1.04

From: Canadian Standardization Test of Fitness Operations Manual, third Edition, 1986

FLEXIBILITY (In Inches) - FEMALES

		AGE				
AWARD	PERCENTILE	18-25	26-35	36-45	46-55	56-65
	100	27	26	25	24	23
	95	25	24	23	22	21
	90	24	23	22	21	20
	85	23	22	21	20	19
GOLD	80	22	21	20	19	18
	75	21	20	19	18	18
SILVER	70	21	20	19	18	17
	65	20	19	18	17	17
BRONZE	60	20	19	17	17	16
	55	19	18	17	16	15
	50	19	18	16	16	15
	45	18	18	16	15	15
	40	18	17	15	15	14
	35	17	16	15	14	13
	30	17	16	14	14	13
	25	16	15	13	13	12
	20	15	14	12	12	11
	15	14	14	11	11	10
	10	13	13	10	10	9
	5	12	11	9	8	7
	0	8	8	6	4	3

From: Golding, et. al., Y's Way to Physical Fitness, Third Edition, 1989

FLEXIBILITY (In Inches) - MALES

		AGE				
AWARD	PERCENTILE	18-25	26-35	36-45	46-55	56-65
	100	26	25	24	23	21
	95	22	22	21	20	19
	90	20	20	19	19	17
	85	20	19	19	17	17
GOLD	80	19	18	17	17	15
	75	18	18	16	16	15
SILVER	70	18	17	16	15	14
	65	17	17	15	15	13
BRONZE	60	17	16	15	14	13
	55	16	16	15	13	11
	50	16	15	14	12	11
	45	15	15	13	12	11
	40	14	14	13	11	9
	35	14	13	11	10	9
	30	13	12	11	10	9
	25	12	12	11	9	7
	20	12	11	9	8	7
	15	10	10	9	7	5
	10	9	9	7	6	5
	5	7	7	5	4	3
	0	2	2	1	1	1

From: Golding, et. al., Y's Way to Physical Fitness, Third Edition, 1989

1.5 MILE RUN - FEMALES

		AGE				
AWARD	PERCENTILE	20-29	30-39	40-49	50-59	60+
	99	<8:33	<10:05	<10:47	<12:28	<11:36
	95	10:47	11:49	12:51	14:20	14:06
	90	11:43	12:51	13:22	14:55	14:55
	85	12:20	13:06	14:06	15:29	15:57
GOLD	80	12:51	13:43	14:31	15:57	16:20
	75	13:22	14:08	14:57	16:05	16:27
SILVER	70	13:53	14:24	15:26	16:27	16:58
	65	14:08	14:50	15:41	16:51	17:29
BRONZE	60	14:24	15:08	15:57	16:58	17:46
	55	14:35	15:20	16:12	17:14	18:00
	50	14:55	15:26	16:27	17:24	18:16
	45	15:10	15:47	16:34	17:29	18:31
	40	15:26	15:57	16:58	17:54	18:44
	35	15:48	16:23	16:59	18:09	18:54
	30	15:57	16:35	17:24	18:23	18:59
	25	16:26	16:58	17:29	18:31	19:02
	20	16:33	17:14	18:00	18:49	19:21
	15	16:58	17:29	18:21	19:02	19:33
	10	17:21	18:00	18:31	19:30	20:04
	5	18:14	18:31	19:05	19:57	20:23
	1	>19:25	>19:27	>20:04	>20:47	>21:06

From: Cooper, K. The Aerobics Institute, Dallas, TX.

1.5 MILE RUN - MALES

		AGE				
AWARD	PERCENTILE	20-29	30-39	40-49	50-59	60+
	99	<6:29	<7:11	<7:42	<8:44	<9:30
	95	8:13	8:44	9:30	10:40	11:20
	90	9:09	9:30	10:16	11:18	12:20
	85	9:45	10:16	11:18	12:20	13:22
GOLD	80	10:16	10:47	11:44	12:51	13:53
	75	10:42	11:18	11:49	13:22	14:24
SILVER	70	10:47	11:34	12:34	13:45	14:53
	65	11:18	11:49	12:51	14:03	15:19
BRONZE	60	11:41	12:20	13:14	14:24	15:29
	55	11:49	12:38	13:22	14:40	15:55
	50	12:18	12:51	13:53	14:55	16:07
	45	12:20	13:22	14:08	15:18	16:27
	40	12:51	13:36	14:29	15:26	16:43
	35	13:06	13:53	14:47	15:53	16:58
	30	13:22	14:08	14:56	15:57	17:14
	25	13:53	14:24	15:26	16:23	17:23
	20	14:13	14:52	15:41	16:43	18:00
	15	14:24	15:20	15:57	16:58	18:31
	10	15:10	15:52	16:28	17:29	19:15
	5	16:12	16:27	17:23	18:31	20:04
	1	>17:48	>18:20	>18:51	>19:36	>20:57

From: Cooper, K. The Aerobics Institute, Dallas, TX.

3.0 MILE WALK - FEMALES

		AGE				
AWARD	PERCENTILE	20-29	30-39	40-49	50-59	60+
	99					
	95					
	90					
	85					
GOLD	80	<36:00	<37:30	<39:00	<42:00	<45:00
	75					
SILVER	70	40:30	42:00	44:00	47:00	51:00
	65					
BRONZE	60	44:00	46:30	49:00	52:00	57:00
	55	48:00	51:00	54:00	57:00	63:00
	50					
	45					
	40					
	35					
	30					
	25					
	20					
	15					
	10					
	5					
	1					

From: Cooper, K. The Aerobics Institute, Dallas, TX.

3.0 MILE WALK - MALES

		AGE				
AWARD	PERCENTILE	20-29	30-39	40-49	50-59	60+
	99					
	95					
	90					
	85					
GOLD	80	<34:00	<35:00	<36:30	<39:00	<41:00
	75					
SILVER	70	38:30	40:00	42:00	45:00	48:00
	65					
BRONZE	60	42:00	44:30	47:00	50:00	54:00
	55	46:00	49:00	52:00	55:00	60:00
	50					
	45					
	40					
	35					
	30					
	25					
	20					
	15					
	10					
	5					
	1					

From: Cooper, K. The Aerobics Institute, Dallas, TX.

PUSH-UPS - FEMALES

		AGE				
AWARD	PERCENTILE	20-29	30-39	40-49	50-59	60+
	95	37	36	32	30	30
	90	32	31	28	23	25
	85	30	27	24	21	17
GOLD	80	26	24	22	17	15
	75	24	22	20	15	13
SILVER	70	22	21	18	13	12
	65	21	20	15	11	12
BRONZE	60	20	17	14	10	10
	55	18	16	13	10	9
	50	16	14	12	9	6
	45	15	13	11	7	5
	40	14	12	10	5	4
	35	13	11	10	4	3
	30	11	10	7	3	2
	25	10	8	5	2	1
	20	9	7	4	1	-
	15	7	6	3	1	-
	10	5	4	2	-	-
	5	2	1	-	-	-

From: Canadian Standardization Test of Fitness Operations Manual, Third Edition, 1986

PUSH-UPS - MALES

AWARD	PERCENTILE	AGE				
		20-29	30-39	40-49	50-59	60+
	95	48	36	30	28	25
	90	41	32	25	24	24
	85	36	30	22	21	18
GOLD	80	34	27	21	17	16
	75	32	25	20	15	13
SILVER	70	30	24	19	14	11
	65	29	22	17	13	11
BRONZE	60	27	21	16	11	10
	55	25	20	15	11	10
	50	24	19	13	10	9
	45	22	17	13	10	8
	40	21	16	12	9	7
	35	20	15	11	8	6
	30	18	14	10	7	6
	25	17	12	10	7	5
	20	16	11	8	5	4
	15	14	10	7	5	3
	10	11	8	5	4	2
	5	9	5	4	2	-

From: Canadian Standardization Test of Fitness Operations Manual, Third Edition, 1986

BENT-KNEE SIT-UPS - FEMALES

		AGE				
AWARD	PERCENTILE	20-29	30-39	40-49	50-59	60+
	95	43	34	28	26	20
	90	39	31	26	22	18
	85	36	29	25	19	16
GOLD	80	34	27	23	17	15
	75	32	26	22	16	14
SILVER	70	31	25	21	14	13
	65	31	24	20	12	12
BRONZE	60	29	23	18	11	10
	55	28	22	17	10	9
	50	27	21	16	7	5
	45	25	20	15	5	4
	40	24	18	13	4	2
	35	23	17	12	3	-
	30	22	16	10	-	-
	25	21	15	7	-	-
	20	19	13	5	-	-
	15	17	11	3	-	-
	10	15	7	-	-	-
	5	11	-	-	-	-

From: Canadian Standardized Test of Fitness, 1981 Survey data

BENT-KNEE SIT-UPS - MALES

		AGE				
AWARD	PERCENTILE	20-29	30-39	40-49	50-59	60+
	95	49	42	36	34	26
	90	45	38	33	28	24
	85	43	36	31	26	23
GOLD	80	41	34	30	25	21
	75	40	33	29	24	19
SILVER	70	39	32	27	23	18
	65	37	31	26	22	17
BRONZE	60	36	30	25	21	15
	55	35	29	24	20	15
	50	34	28	23	20	13
	45	33	27	22	18	12
	40	32	26	21	17	11
	35	31	24	20	16	10
	30	30	23	19	15	10
	25	29	22	17	13	7
	20	27	21	16	11	2
	15	26	20	14	10	-
	10	24	17	11	8	-
	5	20	14	6	-	-

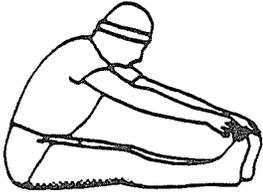
From Canadian Standardized Test of Fitness, 1981 Survey data

ATTACHMENT G

RECOMMENDED STRETCHING EXERCISES

ATTACHEMENT G

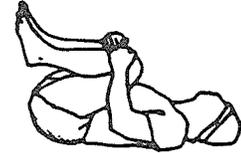
RECOMMENDED STRETCHING ILLUSTRATIONS



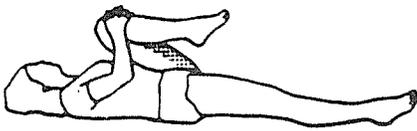
Seated Toe Touch



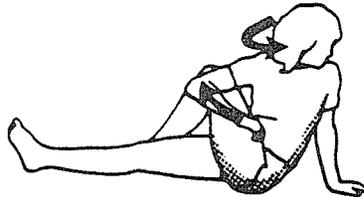
Seated Groin Stretch



Lying Gluteal Stretch



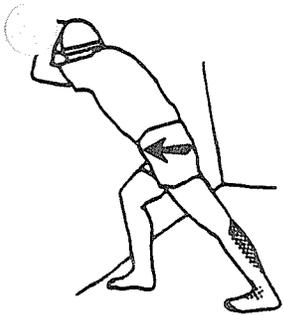
Lying knee to chest
(alternate legs)



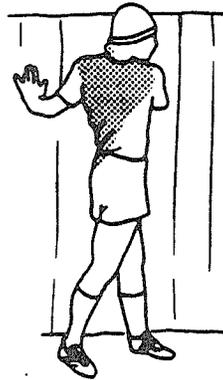
Seated leg over hip and
back stretch



Standing Quad Stretch



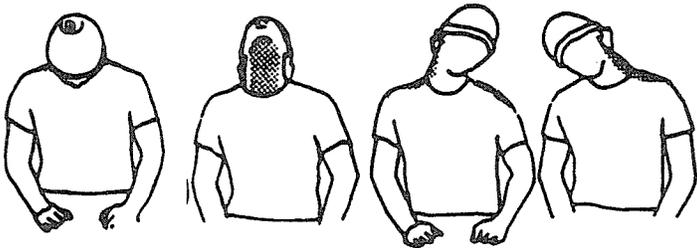
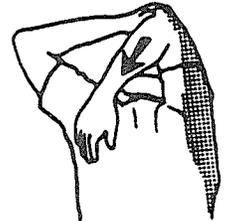
Standing Gastroc with
alternate soleus stretch



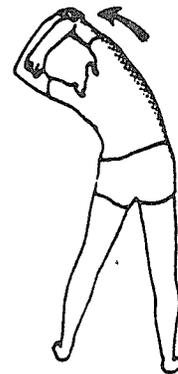
Static Trunk Rotation



Alternate Shoulder
Stretch



Four-way Neck Stretch
(Slow, non-rotational)



Over Head Side Bends

ATTACHMENT H

CALCULATION OF TRAINING HEART RATE RANGE

In general, heart rate is the best indicator of exertion. Since it is measured easily, it can be used to establish appropriate exercise intensity. It is customary to calculate a range, with both lower and upper endpoints, where training is likely to be most beneficial. If an individual consistently trains below a certain level, i.e., 60% of capacity, gains will be minimal (insufficient overload). On the other hand, training above a certain level, i.e., 80% of capacity, is difficult to sustain for an appropriate length of time and can lead to injuries.

Heart rate is usually expressed in beats per minute. It is impractical however, to use this "minute" rate for exercise. An accepted approach is to think in terms of a 10 second period. This is much more practical when applied during an exercise session, as measurement beyond 10 seconds can lead to erroneous estimation since the heart rate falls so rapidly after exercise is stopped.

Measurement of heart rate, at rest or during exercise, can be taken by palpating the radial (wrist) or carotid (neck) artery. Do not palpate both carotid arteries at the same time. It is important to teach program participants how to measure their own heart rate, both at rest and during exercise sessions. This should be a tool that they use in their own personal fitness programs.

The heart rate should be measured after a "steady state" is reached, i.e., after at least 5 minutes of aerobic activity such as running. Once it is measured, it provides feedback in terms of exercise intensity. If the measured heart rate is below the calculated lower end of the training heart rate range, then the participant knows to pick up the pace. If it is above the upper end, the participant should slow down.

Measurement of actual training heart rate should be performed as follows: While still exercising, find the pulse in the wrist. Stop briefly and begin counting the pulse for a 10 second time period (a timepiece is required). It is important to begin counting as soon as possible after stopping since the pulse begins to fall immediately. The first count is actually "zero," not "one." Count 0, 1, 2, 3 and so on for the 10 second period. The steps involved in calculating the training heart rate range and an example of how it is calculated are shown on the following page.

The calculated training heart rate range, which serves as a guide, is determined as follows:

- Step 1. Calculate your estimated maximum heart rate by subtracting your age from 220
- Step 2. Subtract your resting heart rate.
- Step 3. Multiply this number by the lower conditioning intensity (60%).
- Step 4. Add your resting heart rate.
- Step 5. Divide by 6 to get your 10-second value (to be used during exercise).
- Step 6. Repeat Steps 3-5 using upper conditioning intensity (80%).

EXAMPLE: For a 40 year old with a resting heart rate of 70 beats per minute.

To find the lower end (60% of capacity) of the training heart rate range:

Step 1.	220	-	40 years	=	180
Step 2.	180	-	70	=	110
Step 3.	110	x	60%	=	66
Step 4.	66	+	70	=	136
Step 5.	136	÷	6	=	<u>23</u> beats in 10 seconds

To find the upper end (80% of capacity) of the training heart rate range:

Step 3.	110	x	80%	=	88
Step 4.	88	+	70	=	158
Step 5.	158	÷	6	=	<u>26</u> beats in 10 seconds

The Training Heart Rate range for this person would be 23 to 26 beats in 10 seconds.

ATTACHMENT I

Specific Cardiovascular Fitness Training Activities

Power walking

Walking is the most popular exercise performed by Americans today. If walking is done properly, it can improve cardiovascular fitness for many individuals. There are many advantages to power walking; it can be done almost anywhere, requires a minimum amount of equipment, and is one of the safest forms of exercise available.

Power walking is an excellent activity for most individuals, although very fit individuals might find other activities, such as running, more appropriate. Yet even runners can benefit by alternating walking and running workouts -- this will reduce the risk of injury associated with the impact of running.

A brisk 45 minute walk burns about 300 calories. If you did this every day, you would lose 31 pounds a year!

Here are some tips to help you get started with a walking program:

Use a good pair of walking shoes. The most important equipment for walking is a pair of sturdy, comfortable walking shoes that provide good support and cushioning.

Maintain good posture and form. Keep your back erect, and allow your arms to swing naturally back and forth. To increase the intensity, actively swing your arms. Take smooth, even strides and look ahead instead of down at your feet.

Choose a time of day. Choose a time of day and make every effort to stick with it. When do you have the most energy? Some people like to walk in the morning to prepare themselves

for the day ahead. Others like to walk when the day is over to relieve tension and relax. Choose the best time for you, depending on your schedule and your state of mind.

Plan your route. For outdoor power walking, find a course with a smooth, soft surface (such as dirt, or grass) that does not intersect with traffic, if possible. Interruptions like traffic lights will decrease the aerobic benefit of walking. When weather prevents outdoor walking, walk around a track at a health club or school.

Drink water. Don't forget to drink water before you walk. Some people experience stomach cramps if they drink too soon before a walk, so learn to judge this for yourself. Also drink water during long or hot walk, and when you finish.

Walk with a partner. If you prefer to walk alone, do so. But if companionship will make walking more enjoyable and help you stick to your program, find someone to walk with you. Your walking partner should be able to keep the same schedule and walk at the same pace as you do.

Pay attention to the environment. In summer, wear cotton or other porous materials that allow sweat to evaporate. In winter, layer clothing to keep out the cold and wind. The best materials are cotton, fleece-lined cotton, wool, or a breezy nylon. These materials allow sweat to evaporate and keep you warm and dry. Be sure to wear warm socks, a sweat shirt with a hood or a hat, gloves, and a turtle neck to keep all areas of your body covered.

If the environmental conditions are too extreme, curtail walking outside and look for an indoor alternative.

Use your training heart rate range to set the pace. As with any aerobic activity, use your own personal training heart rate range to set the pace. Calculate the low end (60%) and the high end (80%) and use this range to set your walking pace.

Monitor your recovery. Do not push yourself so hard that you're too tired to repeat the same workout within 24 hours.

Keep in mind that any aerobic exercise should be based on your training heart rate range. Use this as your guideline to regulate exercise intensity. For example, a person just beginning the a program should walk miles at 60% of his or her maximum heart rate (see pages 77-78 for instructions on calculation of training heart rate).

Running

Running is a very popular aerobic activity. A certain level of fitness is required for continual running. Oftentimes, individuals begin with walking programs and continue on to running programs as they become more fit. There is usually an intermediate step where walking and running are combined in the same exercise session; this is called a walk-jog program.

Here are some tips to help you get started with a running program:

Use appropriate running attire. The most important attire you need is a good pair of running shoes. The force of your feet hitting the ground can cause shock to the bones and ligaments in your feet, ankles, hips, and even lower back. Running shoes have thick, flexible soles that cushion the sole of the foot and absorb shock for the rest of the body.

Use proper running form. Keep your body erect when running. The heel should strike the

ground first before rolling the weight along the bottom of the foot for push-off. Allow the arms to swing naturally with your stride.

Choose a time of day. Choose a time of day and make every effort to stick with it. When do you have the most energy? Some people like to run in the morning to prepare themselves for the day ahead. Others like to run when the day is over to relieve tension and relax. Choose the best time for you, depending on your schedule and your state of mind.

Plan your route. For outdoor running, find a course with a smooth, soft surface that does not intersect with traffic, if possible. When weather prevents outdoor running, run around a track at a health club or school.

Drink water. Don't forget to drink water before you run. Some people experience stomach cramps if they drink too soon before a run, so learn to judge this for yourself. Also drink water during long or hot runs, and when you finish.

Run with a partner. If you prefer to run alone, do so. But if companionship will make running more enjoyable and help you stick to your program, find someone to run with you. Your partner should be able to keep the same schedule and run at the same pace as you.

Pay attention to the environment. In summer, wear cotton or other porous materials that allow sweat to evaporate. In winter, layer clothing to keep out the cold and wind. The best materials are cotton, fleece-lined cotton, wool, or a breezy nylon. These materials allow sweat to evaporate and keep you warm and dry. Be sure to wear warm socks, a sweat shirt with a hood or a hat, gloves, and a turtle neck to keep all areas of your body covered.

If the environmental conditions are too extreme, do not run outside and look for an indoor alternative.

Use your training heart rate range to set the pace. As with any aerobic activity, use your own personal training heart rate range to set the pace. Calculate the low end (60%) and the high end (80%) and use this range to set your running pace.

Monitor your recovery. Do not push yourself so hard that you're too tired to repeat the same workout within 24 hours.

Cycling

Both outdoor road cycling and stationary cycling are excellent aerobic activities. They use the large muscle groups of the legs and are very low impact.

Here are some tips to get you started on a cycling program.

Use proper equipment and clothing. The most important piece of equipment associated with outdoor bike riding is a sturdy helmet. Select a helmet carefully; make sure it meets an accepted industry standard such as Snell. Consider this as a mandatory piece of equipment, since it protects such a critical area. Good helmets vary in price, and this is often dependent on styling.

You will also need a sturdy, well-made bike. There are many excellent models available, and you don't need to start off with the most expensive. Your best bet is to do a bit of comparison shopping at local bike shops until you find the model you prefer. Or you can rent several models for test rides before you make a purchase. A moderately priced 3 or 5-speed touring bike is a good choice for beginners.

When you cycle, dress for comfort and protection against the weather, chafing and occasional "spills." Heavier fabrics offer more protection from falls than flimsy ones. Avoid tight belts and clothing that restrict circulation. If you're wearing long pants, secure the cuffs with pants clips to keep them out of the bike chain. Wear flexible, low-cut shoes with heavy soles, and wool or cotton socks.

In summer, wear cotton or other porous materials that allow sweat to evaporate. In winter, layer clothing to keep out the cold and wind. The best materials are cotton, fleece-lined cotton, wool or nylon. These materials allow sweat to evaporate and keep you warm and dry. Be sure to wear gloves and a hat or hood in cold weather.

Adjust bicycle seat height properly. Your seat should be adjusted to a height so that your leg has a slight bend at the knee when the heel is placed on the pedal with the pedal at the bottom position. For actual cycling, you should have the ball of your foot on the pedal.

Choose a time of day. Select a riding time that best suits your schedule and preferences. When do you have the most energy? Some cyclists like to start the day with an early morning ride, while others prefer to ride in the evening after work or school. Perhaps you can commute to and from work. Many companies now provide bike racks, and in some cities special "bike traffic" lanes are designated along major thoroughfares.

Plan your ride. A regular time and place for your rides will help you stick to your cycling program. Is there a scenic bike trail nearby, off limits to automobiles? In some areas, you may be able to find an indoor velodrome open to the public. If you ride through city streets, take care to avoid dangerously busy intersections, rocky gravel roads and steep hills--and be sure to familiarize yourself with the basics of bike safety in traffic.

Drink water. Don't forget to drink water before you ride. Some people experience stomach cramps if they drink too soon before a ride, so learn to judge this for yourself. Also drink water during your ride. Most bikes now come equipped with frame cages to hold plastic water bottles. If your bike does not have such cages, use a fanny pack or backpack to carry a water bottle.

Choose a Cycling Partner. Bicycling is even more enjoyable when done with a partner or in a group. If companionship will make it easier to stick to your cycling program, find someone to ride with you. Ask your spouse or a friend, or see if there's a cycling club in your area.

Pay attention to the environment. If the environmental conditions are too extreme, do not ride outside and look for an indoor alternative, such as stationary cycling on an ergometer. Also avoid outdoor riding in wet or dimly lit conditions, since the hazards associated with automobiles increase significantly under adverse conditions.

Use your training heart rate range to set the pace. As with any aerobic activity, use your own personal training heart rate range to set the pace. Calculate the low end (60%) and the high end (80%) and use this range to set your cycling pace.

Monitor your recovery. Do not push yourself so hard that you're too tired to repeat the same workout within 24 hours.

Swimming

Swimming is an excellent aerobic activity that has several unique advantages. Some of these advantages are:

- The cushioning effect of water means less stress on bones, joints and muscles than in some dry land sporting activities.
- The major muscles of the body -- including legs, arms, back and waist -- are toned and strengthened.
- The resistance of the water is equivalent to exercising with weights which further adds to balanced muscle strength.
- Because of the reduction of stress on the body, elderly people and those with joint problems, such as arthritis, can enjoy swimming without discomfort.

Here are some tips on starting a swimming program:

Learn to swim if you don't know how. If you don't know how to swim, contact local colleges, the parks and recreation department or health clubs. These organizations usually offer classes for all ages at varied times during the day. If you are hesitant to take up swimming because you don't know how, you may be surprised at how easy it is to learn.

Find a place to swim. With an increased awareness of the benefits of physical fitness, more swimming facilities are available now than ever before. Indoor facilities allow you to continue your swimming regimen year-round. Ask the parks and recreation department about the availability of public pools or ask the local school system or colleges about public use of their pools.

When choosing a facility, you may want to visit during lap swim to see how crowded the pool is. Find out what the pool's hours are and if they would meet your scheduling needs. Ask pool personnel if there are any classes or a swimmers' club. With the variety of facilities available, you should be able to find one that meets your needs.

Some people choose to swim in open water, but that subjects you to nature's elements. If you swim in open water, such as an ocean, a river or a lake, always make sure there are lifeguards present and check with the marine patrol for information on weather, tides, depth, current, undergrowth and other factors that could affect your swim. You can never be too safe when swimming in open water.

Although swimming is not a team sport, many swimmers find that they can meet and share training tips with other swimmers. That's another attraction about the sport -- it can be as solitary or as social as you want it to be.

Start easy. When you start your swimming program, be easy on yourself. Begin with a half lap or as many laps as you can, even if it's only one or two, and increase the number of laps gradually. It's important not to overdo it --

you may be tempted to quit if you wear yourself out. If it takes longer than 5-10 minutes for your pulse to slow down after exercise, or if you have difficulty breathing, feel faint or have prolonged weakness, reduce your pace or stop. Listen to your body. You should cool down until your heart rate returns to 100 beats per minute or less.

Use proper equipment. The only equipment or attire that you need is a good swimming suit. A good suit should be lightweight and made of nylon, lycra, or a nylon blend. The suit should fit snugly to streamline your body, but it should not be so tight that it is uncomfortable.

Use your training heart rate range to set the pace. Your heart rate is lower when you are immersed in water, so you should modify your training heart rate range for swimming. Your maximum heart rate is reduced by about 13 beats per minute. Calculate your range as usual, but at step 3 (page 68) subtract 2 beats from the answer. So, if your training heart rate range is normally 18 to 25 beats in 10 seconds, it would become 16 to 23 beats for swimming.

Some other basic rules to follow are:

- Don't swim alone -- there should always be a lifeguard or other staff person at the pool, or you should swim with a "buddy."
- Don't drink and swim - no alcoholic beverages.
- Stay out of areas restricted to diving.
- Don't dive into a crowded pool.
- Don't eat a heavy meal at least an hour before you swim.
- Be sure water is free of unhealthful pollutants.

Aerobic Dancing

Aerobic dance is a combination of rhythmic movements and simple dance steps set to music that can improve and maintain cardiovascular fitness. Men and women are finding this to be an excellent aerobic activity, especially suitable for the winter months when indoor exercise has advantages.

Here are some tips on starting an aerobic dance program:

Choose proper equipment and clothing. Shoes are probably the most important piece of exercise equipment since they provide grip, stability, support and cushioning. Choose a shoe that fits your foot well and matches your activity. Clothing should be non-restrictive and allow for quick evaporation of sweat. Wearing plastic or similar non-breathable clothing can cause severe water loss and overheating. Drink plenty of water before and after working out!

Choose a good facility. Look for a facility that is close to your home or place of work and offers classes at times that will fit in with your busy schedule. The facility should be clean and the workout area well ventilated. A carpeted floor with some "give" to it is advised over a hard wood floor.

Most facilities offer beginning, intermediate and advanced classes. It's best to choose a class that corresponds to your current fitness level. However, any class can be modified to meet any level of fitness. A good instructor can, and should, demonstrate ways to modify movements to meet the needs of all individuals in the class.

Choose a good instructor. Find out if the instructors are certified by a professional organization. Beware of any instructor who says that exercise must hurt (or "burn") to do any good. Exercise should require some effort, but if you have continuous pain during an

exercise, **STOP**; and continue only if you can do so painlessly. Your instructor or an on-duty staff member should have current CPR certification. Don't be afraid to ask.

Begin slowly. Anyone starting a program of aerobic dance, and especially one who has been sedentary, should not go "all out" from the start. Begin easily. You don't have to keep up with the instructor or other exercisers or the beat of the music. If a class includes an exercise which you feel is too difficult for you, substitute another. After becoming accustomed to one level of exercise, progress to a more demanding level.

Use your training heart rate range to set the pace. As with any aerobic activity, use your own personal training heart rate range to set the pace. Calculate the low end (60%) and the high end (80%) and use this range to monitor your exertion level.

Maintain proper posture. Always be conscientious of your posture while exercising: keep your back aligned (abdominal muscles contracted, buttocks tucked in, and knees slightly bent).

Control your movements. If you are unable to control your movements, slow down. Rapid, jerky movements can set the stage for injury by overstressing joints. Instead, as you move your limbs, keep the muscles in them contracted and move them as if you're pushing against some resistance.

Opt for low-impact aerobic dancing. The repetitive, jarring, and jumping movements in high impact aerobics have caused many instructors and students to suffer injuries to the shins, calves, lower back, ankles and knees. A less stressful form of aerobics (low-impact aerobics) substitutes marching or gliding movements for the jumping motions of typical aerobic classes. Arm movement is emphasized to help raise the heart rate. A well-designed low-impact aerobic routine can easily raise your heart rate enough to provide cardiovascular benefits.

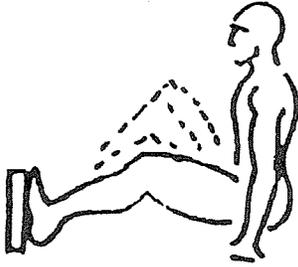
ATTACHMENT J

WEIGHT TRAINING

EXERCISE

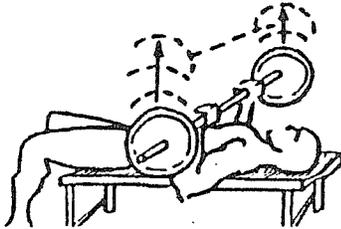
ILLUSTRATIONS

1. Leg Press



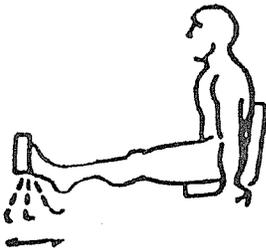
Sit squarely in chair; don't allow buttocks to raise off seat; thighs should almost touch chest at start.

2. Bench Press



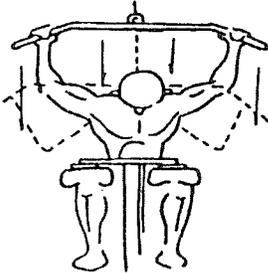
Don't arch back, don't bounce bar off chest; bar should touch chest at sternum; use medium grip (shoulder width).

3. Toe Press



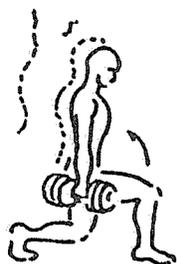
Don't allow knee to assist in either movement; keep knees locked; use as full a range of movement as possible.

4. Lat Pull Down



Pull bar down to base of neck, pull with lats rather than arms. Don't rock bar down by leaning back; only arms and shoulders move.

5. Bar Bell Lunge



Step out 2-3 feet; back knee touches floor; push backward with front leg to standing position, alternate legs.

6. Tricep Push-Down



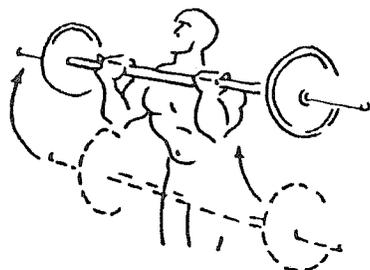
Keep elbows against ribs; only forearms move!! DON'T jerk your torso forward as you start to press down.

7. Crunches



The upper body curls up until the shoulder blades leave the floor, or as high as possible; BUT the small of the back stays on the floor. Hold the "up" position for at least 3 seconds; don't bounce up off the floor. At the start of each repetition, contract abdominals so that sternum pulls toward pelvis.

8. Bicep Curl



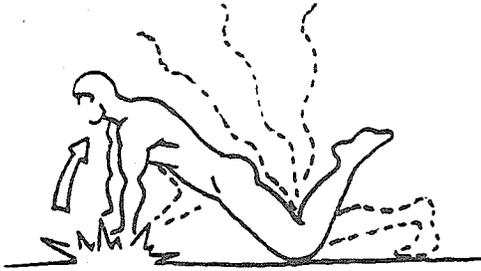
Don't sway your hips to help the barbell up!! Only the forearms move at the elbow.

ATTACHMENT K

CALISTHENIC EXERCISE ILLUSTRATIONS

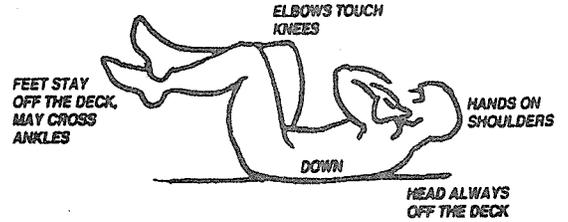
AEROBIC EXERCISE CIRCUIT CALISTHENICS

POWER PUSHUP



EXPLODE UP OFF FLOOR... DROP
BACK DOWN... EXPLODE UP AGAIN

ABDOMINAL CRUNCH



SLOW DOWN ON THIS
EXERCISE!
THE SLOWER
IT'S DONE
THE **HARDER**
IT IS...



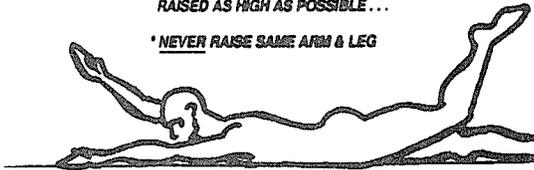
NOTE:
VERBALLY ENCOURAGE
CADETS TO "SQUEEZE"
THE ABDOMINAL MUSCLES

LOWER BACK MUST
REMAIN IN CONTACT
WITH THE DECK...
SHOULDER BLADES
MUST LEAVE DECK
IN THE "UP",
POSITION

MODIFIED DORSAL ARCH

ALTERNATE ARM & LEG IS
RAISED AS HIGH AS POSSIBLE...

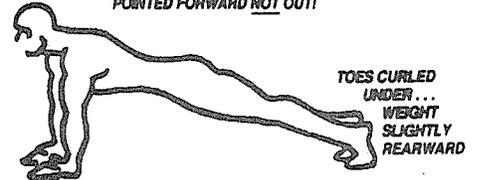
* NEVER RAISE SAME ARM & LEG



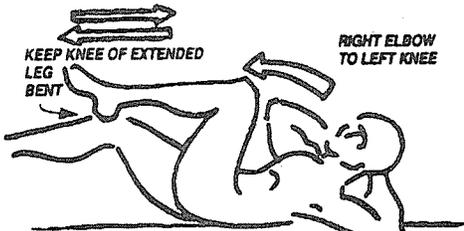
ONE COUNT = COMPLETE CYCLE, EACH ARM
AND LEG RAISED ONCE...

PUSHUPS

BACK STRAIGHT... EYES FORWARD, NOT
DOWN... HANDS UNDER SHOULDER,
NOT OUT TO SIDES... FINGERS
POINTED FORWARD NOT OUT!



ABDOMINAL CRUNCH WITH A "BICYCLE"



ALTERNATE KNEES INTO
OPPOSITE ELBOW



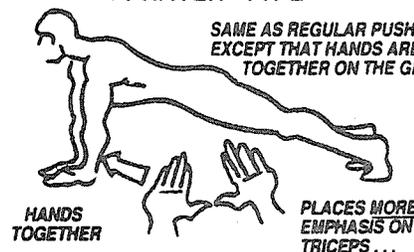
DO NOT EXTEND LEGS STRAIGHT
OUT, TOO MUCH STRAIN ON THE
LOWER BACK



THE WHOLE BODY MUST COME UP
AT THE SAME TIME... NOT ARCHED
BACK FOLLOWED BY HIPS

PUSHUPS "PRAYER" TYPE

SAME AS REGULAR PUSHUPS
EXCEPT THAT HANDS ARE
TOGETHER ON THE GROUND...



ATTACHMENT L

PRIMER ON NUTRITION

Myths About Nutrition

Myth: Active people require more protein to improve their ability to exercise.

Truth: Exercising on a regular basis (not additional protein) is the main thing that will improve physical performance.

Myth: Restricting fluid intake is recommended practice during training.

Truth: Water is essential during any athletic effort and should never be restricted.

Myth: Salt tablets are beneficial for replacing sodium that is lost in sweat.

Truth: Salt tablets are not recommended because an excessive salt intake puts extra burden on the kidneys.

Tip: Generally, any sodium loss during exercise is best replaced at the next meal. Whenever you do consume salt, drink lots of water.

Myth: Eating foods high in sugar before exercising is a good source of quick energy.

Truth: Although sugar is a source of fuel, it takes about 20-30 minutes before its energy becomes available to your muscles.

Tip: Avoid large amounts of sugar before exercise; otherwise dehydration, stomach discomfort, and low blood sugar may result.

Myth: A large steak or hamburger is an excellent pre-game meal.

Truth: Large portions of high-fat meats can delay the emptying of your stomach; your food may still be in the process of digesting when you are exercising.

Tip: Carbohydrates such as bread, cereals, and pasta are much better than large meat portions as a pre-game meal.

Myth: Exercise significantly increases appetite and is not beneficial for weight loss.

Truth: Aerobic exercise actually improves appetite control in most people on low-calorie diets.

Tip: Regular physical activity is an essential part of any weight reduction program.

Myth: Physically active people do not need to follow the American Heart Association's recommendations for a cholesterol-lowering diet because exercise helps burn cholesterol.

Truth: Exercise may increase the level of "good" cholesterol (HDL) in the blood, but it does not significantly lower total serum cholesterol. Low-fat, low-cholesterol diets are important for reducing the blood cholesterol of most people

Tip: The American Heart Association's dietary recommendations are beneficial for anyone, whether sedentary or active.

American Heart Association (AHA) Dietary Recommendations

The American Heart Association recommends the following:

- Adjust your calorie intake for maintaining the most desirable weight.
- Reduce your total intake of fat.
- Reduce your intake of saturated fats, which are primarily animal fats, but also reduce certain vegetable fats like palm, palm kernel, and coconut oil.
- Replace some of the saturated fats with unsaturated fats such as corn, sunflower, safflower, soy, canola, or olive oil.
- Reduce dietary cholesterol.
- Increase carbohydrates, especially complex types, such as whole grain breads, bran cereals, starchy vegetables, and legumes.
- Substitute herbs and spices for some of the salt.

A Well Balanced Diet

A well balanced diet includes six elements which function together to satisfy your body's needs for calories and essential nutrients:

Protein
Carbohydrates
Fat
Vitamins
Minerals
Water

All foods contain combinations of these elements. No food consists of only one element. Dairy products, for example, have varying amounts of each of the above elements.

Protein Protein is essential to life because it furnishes the building blocks for your body tissue and is needed for its repair and maintenance. It also is a component of enzymes, hormones, and numerous other chemical tissues. Protein should not be considered an important source of energy. In fact, it can be used as a source of energy only when the more appropriate sources (i.e., carbohydrates and fats) are not available.

The protein needs of both sedentary and active people are the same. A football player has about the same protein requirements as a clerk of the same size. The only exceptions are athletes who are involved in muscle-building activities or in injury-prone sports, where tissue repair is a frequent occurrence. However, the increased protein need is minimal. Six to eight ounces of protein foods per day fulfills the requirements of most people. Recommended sources of protein which are also in line with maintaining cardiovascular health are low-fat meats, poultry, fish, legumes (beans and bean products), and non-fat dairy products.

Fats Fats are the most concentrated source of energy, providing 250% (2.5 times) more calories than protein or carbohydrates. Fats are well-suited for storage of excess calories. Although they are not a source of quick energy, fats are the major fuel used during endurance activities.

Because fats leave the stomach slowly, avoid high-fat foods prior to physical activity. Otherwise you may experience an uncomfortable sense of fullness as you exercise.

Americans consume about 37% of their calories in fat. The AHA recommends cutting that to less than 30%. By reducing the amount of fats they consume, most people can reduce the level of cholesterol in their blood.

Carbohydrates Carbohydrates, which include starches and sugars, are the most efficient, readily available sources of energy. These are the major sources of energy for the brain and are necessary for fat and protein metabolism.

Carbohydrates are stored in the form of glucose in the blood and glycogen in the liver and muscles. However, the storage is limited, providing energy for less than a day. It is important to replenish supplies at regular intervals. One of the limiting factors in endurance sports is muscle glycogen. Plentiful stores of carbohydrates in the body are important for excelling in physical activity, especially endurance activity.

Americans consume about 40% of their calories in carbohydrates. The AHA recommends increasing that to 50-55%. This increased carbohydrate consumption should be derived from complex carbohydrates such as whole grain breads and cereals, starchy vegetables, and legumes. These foods are high in vitamins, minerals, fiber, and are moderate in calorie content.

Vitamins Vitamins are essential to life. They assist in the hundreds of chemical reactions which occur continuously in our bodies. Contrary to popular belief, vitamin requirements are not significantly increased by physical activity. Water-soluble vitamins such as vitamin C and B-complex are not stored in the body and must be consumed daily. Fat-soluble vitamins, A, D, E and K are stored in the body tissues, and large doses which greatly exceed normal requirements may result in "vitamin overdose." You can fully meet your vitamin requirements by consuming a well-balanced diet. For people whose diets are poorly balanced, a doctor may suggest a multi-vitamin pill containing 100% of the USRDA (United States Recommended Dietary Allowance) for essential vitamins.

Minerals There are more than 24 different minerals. A major function of minerals is their role in chemical reactions occurring within the cells. They help to release energy during the breakdown of energy sources.

Your need for most minerals does not increase significantly with physical activity. One important exception is the increased requirements for sodium (salt) and potassium during intense, prolonged exercise in hot weather. However, as with vitamins, you can

fully meet your mineral requirements by eating a well balanced diet. For those with low intakes of certain minerals, a doctor may suggest supplements.

Water Water is essential to survival. Every function and movement of your body requires water -- digestion, metabolism, and removal of waste products. Water is especially important for temperature control. Normally, you should drink 6-8 glasses per day. Drink even more during prolonged activity or when exercising in warm weather.

Avoid drinking alcohol before exercising. It is a poor source of energy, has a depressing effect on the heart and central nervous system, and enhances dehydration.

The Pros and Cons of Sugar

Americans tend to eat large amounts of sugar -- an average consumption of more than 100 pounds per person per year. Many sugars are hidden in prepared foods in the form of sucrose and corn sugars.

Sugar is quickly absorbed into the tissue and is available as a source of energy (glucose) within 20-30 minutes. The glucose from sugar restores glycogen to fatigued muscles, prevents exhaustion, and increases endurance. Eating sugar before activities which are less than 20 minutes in length provides little physiological benefit, since energy for such brief events is already present in the muscles.

Dehydration, low blood sugar, and reduced athletic performance can result from ingesting large amounts of glucose, sugar, honey, candy, or highly-sweetened sugar solutions, such as commercial "athletic" drinks and sweetened carbonated beverages.

Eating Before Exercising

During moderate recreational activity, your body's fuel comes from foods consumed during the entire week. Food eaten immediately before exercising will not affect that activity. It's

important to remember, however, that the stomach should be nearly empty to prevent discomfort. Carbohydrate foods, low in fat, such as whole grain breads, are generally well-tolerated.

It is a good idea to drink several cups of water before exercising. This is especially important in warm weather. With prolonged or vigorous exercise, you should drink small quantities of fluid every 10-15 minutes during the activity.

Weigh yourself before and after prolonged and vigorous exercise. A two pound weight loss represents one quart of body fluid. Thirst is not usually an accurate guide to your immediate water needs. You must make a conscious effort to drink enough water.

Carbohydrate-Loading Diet

A well-trained body is able to exercise for prolonged periods (60 minutes or more) as long as glycogen is available to the muscles. The amount of glycogen available and the intensity of the exercise determines the length of time you can exercise but not how fast.

Liberal amounts of carbohydrates (e.g., bread, pasta, potatoes, cereals) help maintain optimal levels of muscle glycogen. Carbohydrate-loading or "super-compensation," a training technique used by some athletes to improve endurance, significantly increases muscle glycogen. However, several harmful side effects can occur with this program:

- You may become tired during the early phase of the program and may experience diminished confidence and ability to prepare mentally for the contest.
- The water stored with glycogen may cause rapid weight gain and reduce your overall ability to perform.
- Young athletes and adults at risk for heart disease or other chronic disorders should avoid this technique because of potential physical problems.

If you use the carbohydrate-loading technique, limit it to no more than a few times per year and then only to high-endurance events.

Carbohydrate-loading is useless to anyone exercising less than several hours a day because the stored glycogen will not be used except in true endurance events. Athletes who normally eat a high-carbohydrate diet may already be "super-compensated" with glycogen so that carbohydrate-loading is unnecessary.

General Tips for Eating Out

Whether or not you're on a diet, you can dine out healthfully if you know how. Try asking these questions when you call ahead or before you order:

Do you or would you upon request:

1. Serve margarine (rather than butter) with the meal?
2. Serve skim (rather than whole) milk?
3. Prepare a dish using vegetable oil (corn, soy, sunflower, safflower) or margarine made with vegetable oil (rather than butter)?
4. Trim visible fat off meat or skin poultry?
5. Broil, bake, steam or poach (rather than saute or deep fry) meat, fish or poultry?
6. Limit portion size to 4 to 6 ounces of cooked meat, fish or poultry?
7. Leave all butter, gravy or sauce off an entree or side dish?
8. Serve fruit (fresh or in light syrup) for dessert?
9. Prepare a dish without added salt or monosodium glutamate (MSG)?
10. Accommodate special requests if made in advance by telephone or in person?

11. Have a special seating area for non-smokers?

Once you're in the restaurant, be assertive. Remember that you are the patron. Ask questions. Don't be intimidated by the menu, the atmosphere, your waiter or waitress. Study the menu carefully and order for yourself. If you wish to cut down on portion size, choose appetizers as the main course, order a la carte or share food with a companion. Insist that

food be served the way you want it -- with dressings and sauces on the side, for example. Enlist the help of your waiter or waitress. Ask how our selections are prepared. And if your food arrives and has not been fixed as you requested, send it back.

To make all these principles easier to follow, here are some tips on reading menus.

1. Learn which terms and phrases telegraph low-fat preparation. Look for:

"steamed"	"in its own juice"
"garden fresh"	"broiled"
"roasted"	"poached"
"tomato juice"	"dry broiled" (in lemon juice or wine)

2. Be aware that some low-fat, low-cholesterol preparations are high in sodium. Watch out for foods that are:

"pickled"
"in cocktail sauce"
"smoked"
"in broth"
"in a tomato base"

3. Menu descriptions that warn of saturated fat and cholesterol preparation may also indicate high sodium. Avoid foods that are:

"buttery," "battered," "in butter sauce"
"sauteed," "fried," "panfried," "crispy," "braised"
"creamed," "in cream sauce," "in own gravy," "hollandaise"
"au gratin," "Parmesan," "in cheese sauce", "escaloped"
"marinated" (in oil), "stewed," "basted"
"casserole," "prime," "hash," "pot pie"

Recommended Daily Eating Pattern

1. Low fat breads, cereals, grains, rice, and pastas 4 or more servings
2. Beans, peas, lentils, and seeds As often as desired
3. Fruits and vegetables 4 or more servings
4. Dairy products: non-fat, low fat 2 or more servings
5. Fish, poultry, lean meats and cheese 6 ounces or less
6. Egg yolks 3 or less yolks per week (whites as desired)
7. Acceptable margarines, oils and salad dressings 2-4 tablespoons
8. Acceptable desserts and snacks As appropriate for weight control

Healthy Food Choices

Beverages Generally, fruit and vegetable juices, low-fat and skim milk are good beverage choices. Remember, water is also a good choice; try it with a slice of lemon, orange, or lime.

Breads, bread products, and mixes Use whole grain or enriched breads, rolls, or bread sticks that are low in fat. When preparing products from mixes or recipes, use only acceptable ingredients such as egg whites, recommended egg substitutes, margarines and oils.

Cereals Most cereals, except the granola variety, are low in fat and are acceptable. However, cereals vary widely in their sugar content. Generally, if sugar is listed among the first three ingredients, the cereal is high in sugar. Note that granola cereals that are made with coconut oil, palm oil, or animal or vegetable shortenings often have three times as many calories as granola cereals that are made with the more healthful polyunsaturated oils.

Crackers and Chips Currently, most commercial crackers are made with animal and/or hydrogenated vegetable fat and are high in sodium. First-choice crackers are those made with no added fat or high-sodium seasonings: zero-fat and low sodium crackers. Second-choice crackers are those made with a minimum of added fat: low-fat crackers. Some crackers and chips made with acceptable oils recently have become available: check the labels to make sure.

Dairy Products Most cheeses are very high in fat. They usually contain at least 30 percent fat, and 70 percent of the calories in cheese come from fat! Recently, however, more oil-filled and lower-butterfat cheeses have become available.

The acceptable cheeses listed below are grouped according to their fat content:

1. Low-Butterfat Cheeses

(less than or equal to 3 grams of butterfat per ounce)

2 Medium-Butterfat Cheeses

(4-5 grams of butterfat per ounce)

3. Cheese Made with Oil

(6-10 grams of oil per ounce)

Like high-butterfat cheeses, cheeses made with oil are high in fat. The difference is that most of the butterfat has been removed and replaced with vegetable oils, such as safflower, sunflower, corn, or cottonseed oil.

The lower the butterfat and saturated vegetable fat the better. And there's another bonus for the lower butterfat cheeses: they are lower in calories.

Desserts and Sweets Desserts contribute a significant amount of fat, sugar, and calories to the diets of many people. You might want to assess the role that cookies, cakes, and other desserts play in your diet. For example, do you eat these items daily or only occasionally? While the desserts mentioned in this section are generally low in saturated fats and cholesterol, they still are concentrated sources of sugar and calories. A good approach is to make use of a delightful alternative: fruit. A crisp apple or a juicy peach can satisfy a sweet tooth as well as provide an alternative that is lower in fat, sugar, sodium, and calories than are most commercial desserts.

Margarines The best margarine choices are those that are low in saturated fats and high in polyunsaturated fat. Generally, accepted margarines are in the "tub" form and list a liquid oil as the first label ingredient, e.g., "liquid safflower, sunflower, or corn oil."

Many margarine labels have information on the fat and cholesterol content that can be helpful in choosing margarines.

Oils Choose those vegetable oils that are the highest in polyunsaturated fat and lowest in saturated fat.

First choice oils: (ranked in order of preference)

Safflower
Walnut
Sunflower
Corn
Soybean (unhydrogenated)
Wheat-germ

Fish, Poultry, Lean and Processed Meats

There is a common misconception that people need large amounts of meat daily to get enough protein. Most Americans consume at least twice as much protein as their bodies need. Because meat, poultry, and fish are the major sources of saturated fat and dietary cholesterol in Americans' diets, it is important to be selective in the kind of meat, poultry, and fish you eat and to limit the amount to 6 ounces or less per day.

First

Choice: Choose plain or unprocessed fish, shellfish, and poultry, as they are relatively low in saturated fat and calories compared to most red meats.

Second

Choice: Choose lean meats (beef, lamb, pork, and veal) with the least amount of visible fat. Trim the visible fat around the meat before preparing it, and use low-fat cooking techniques, such as roasting and broiling.

Note: Organ meats, such as liver, heart, kidney, sweetbreads, and brains are low in fat but high in cholesterol; limit their use.

Fruits All fresh, canned, dried, and frozen fruits are acceptable. Because fruits are relatively low in calories, contain negligible sodium, and are high in certain nutrients (such as potassium) and fiber, they are excellent choices anytime. Use them for appetizers, salads, desserts, or snacks. When purchasing canned fruit, save calories and sugar by buying the variety packed in its own juice.

Meat Substitutes When planning meatless or meat-extended meals, many kinds of products can be used as substitutes for meat. To prepare a meatless meal that helps assure high quality protein, combine the following foods:

Legumes (beans, peas, and lentils) and lowfat dairy products.

Legumes and bread, cereal, or grain products.

Bread, cereal, or grain products and lowfat dairy products.

Nuts or seeds and lowfat dairy products.

In general, to make meatless dishes, choose products that contain a minimal amount of saturated fat.

Nuts and Seeds All nuts, except coconut, and all seeds are acceptable. Avoid those roasted in coconut or palm oil. Note that while nuts and seeds are good sources of protein, they are concentrated sources of calories. Most contain more than 150 calories per ounce with about 80% of the calories coming from fat. So, although nuts and seeds are nutrient dense, they are also quite high in fats! Use discretion when snacking on or adding these products to other foods.

Pasta, Noodles, and Rice Plain pasta, noodles, and rice (with the exception of egg noodles) are low in saturated fat and cholesterol. Prepare them with acceptable ingredients such as margarine, lowfat sauces, and low sodium seasonings.

Salad Dressings If you use commercial salad dressings, choose dressings made with minimal amounts of cream, cheese, and egg yolk. When preparing salad dressings from a dry mix, use an acceptable oil. Most salad dressings contain 70-100 calories per tablespoon. For a low-calorie alternative, try lemon juice or vinegar with herbs.

Vegetables In general, vegetables contain negligible fat and sodium, are relatively low in calories, and are high in certain nutrients, such as potassium and fiber. Use them often for appetizers, salads, side dishes, as part of main dishes, or as snacks.

Definitions

Calorie: A unit used to express the energy value of foods or the amount of energy used by activity.

Cholesterol: A fat-like waxy substance found in animal products. Cholesterol does not supply energy but is essential for normal cell function and as a building block for hormones. The amount of cholesterol in the bloodstream, **blood cholesterol**, has been shown to be a major risk factor for developing heart disease. **Dietary cholesterol** is found in all animal products but is especially high in egg yolks and organ meats. Eating foods high in dietary cholesterol tends to raise the level of blood cholesterol. Foods of plant origin such as fruits, vegetables, grains, and legumes contain no cholesterol.

Fat: Fats are components of food that provide the most concentrated source of calories. There are three basic types of fats. These are as follows:

Monounsaturated Fat - A fat that lowers blood cholesterol but not as much as polyunsaturates. Examples of monounsaturated fat sources are olive oil, peanut oil, and avocados.

Polyunsaturated Fat - A fat usually of plant origin which tends to lower blood cholesterol levels. It is usually liquid at room temperature. Examples of polyunsaturated fat sources are safflower, sunflower, corn, soybean, and cottonseed oils.

Saturated Fat - a Fat usually of animal origin which tends to raise blood cholesterol levels. It is solid at room temperature, with the exception of palm and coconut oils. Examples of saturated fat sources are lard, butter, solid (hydrogenated) vegetable shortening, palm oil, and coconut oil.

Hydrogenation: A chemical process that changes liquid vegetable oils into solid fats, as in vegetable shortenings. Because hydrogenation increases the amount of saturated fat, these fats should be avoided or used sparingly.

Lipid: A general term for fats, oils, and similar substances.

Potassium: A mineral element that is important for body fluid balance. Potassium may play a role in blood pressure regulation. Major food sources are fruits and vegetables.

Sugar: A sweet-tasting carbohydrate that adds calories or energy, but few other nutrients to the diet. Sucrose, the sugar we usually eat as table sugar, is the major source of sugar in the American diet. Limiting the intake of foods high in sucrose is an important part of cavity prevention, weight control, and triglyceride control.

Triglyceride: A fat normally present in the blood. Excess weight, diets that are high in sugars -- especially sucrose -- and alcohol may increase the triglyceride level in the blood.

