



# COORDINATOR'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  
COORDINATOR'S MANUAL**

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**1993**

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## PREFACE

This manual was developed in direct response to the wishes expressed by California law enforcement for a model physical fitness program that could be adopted by local agencies.

The program described in this manual is designed to promote officer fitness by recognizing officers who achieve and maintain exemplary levels of physical fitness. In addition to meeting these standards, all program participants are required to develop and maintain a personal exercise program.

Officer participation in the program should be voluntary. **Current protections under the Americans with Disabilities Act of 1990 and the Civil Rights Act of 1991 may necessitate modifications to the program if officer participation is made mandatory; agencies considering adoption of the program in this manner are strongly advised to first consult with legal counsel.**

POST is pleased to be able to offer this program as a means of assisting local law enforcement agencies, and we are confident that you will find it 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



## ACKNOWLEDGMENTS

Many individuals contributed to the successful development of this program. First and foremost, POST wishes to thank the over 150 officers from the following departments who were directly involved in the pilot test of the program.

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University of California at San Diego Police Department

Alameda County Sheriff's Department

Napa County Sheriff's Department

Garden Grove Police Department

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# TABLE OF CONTENTS

COMMISSIONERS .....	iii
PREFACE .....	v
ACKNOWLEDGMENTS .....	vii
TABLE OF CONTENTS .....	ix
<b>CHAPTER 1: INTRODUCTION .....</b>	<b>1</b>
1.0 PROGRAM CONTENTS .....	1
1.1 HOW DOES THE PROGRAM WORK? .....	1
1.2 WHAT QUALIFICATIONS SHOULD THE FITNESS COORDINATOR HAVE? .....	1
1.3 WHAT IS THE FITNESS COORDINATOR'S ROLE? .....	3
1.4 HOW DO I ADVERTISE THE PROGRAM? .....	3
1.5 WHAT FACILITIES, SERVICES AND EQUIPMENT ARE NEEDED? .....	4
1.6 WHAT HAPPENS IN THE ORIENTATION SESSION? .....	4
1.7 HOW DO I CONDUCT THE PRE-SCREENING? .....	5
1.8 HOW AND WHEN DO I CONDUCT THE FITNESS ASSESSMENT? .....	5
1.9 HOW DO I INTERPRET FITNESS TEST SCORES? .....	5
1.10 HOW DO I COUNSEL PARTICIPANTS ABOUT EXERCISE? .....	5
1.11 WHAT ARE THE AWARDS AND HOW DO I ADMINISTER THEM? .....	6
1.12 HOW DO I RECOGNIZE FIT OFFICERS IN MY AGENCY? .....	6
1.13 WHAT RECORDS DO I NEED TO KEEP? .....	6
1.14 WHAT DO I DO IF I HAVE QUESTIONS? .....	7
<b>CHAPTER 2: PRE-SCREENING .....</b>	<b>8</b>
2.0 INTRODUCTION .....	8
2.1 INFORMED CONSENT .....	8
2.2 PHYSICAL EXERCISE READINESS QUESTIONNAIRE (PERQ) .....	9
2.3 RESTING HEART RATE .....	9
2.4 RESTING BLOOD PRESSURE .....	10
2.5 REFERRING THE PARTICIPANT TO A PHYSICIAN .....	11
2.6 CONFIDENTIALITY OF FITNESS PROGRAM INFORMATION .....	11
<b>CHAPTER 3: FITNESS ASSESSMENT PROCEDURES .....</b>	<b>14</b>
3.0 INTRODUCTION .....	14
3.1 GENERAL HEALTH INDICES .....	14
3.1.1 RISK .....	14
3.1.2 Tobacco Use .....	14
3.1.3 Cholesterol .....	14
3.2 PHYSICAL FITNESS TEST BATTERY .....	15
3.2.1 Cardiovascular (Aerobic) Fitness .....	15
3.2.2 Flexibility .....	15
3.2.3 Muscular Fitness: Strength and Endurance .....	15
3.2.4 Body Composition .....	15
3.3 PHYSICAL FITNESS WRITTEN EXAMINATION .....	16
3.4 PREPARATION OF A PERSONAL FITNESS PLAN .....	16
3.5 SCORING AND AWARD STRUCTURE .....	17
3.6 RECORD KEEPING .....	17

CHAPTER 4: INTERPRETING RESULTS .....	18
4.1 PRE-SCREENING INTERPRETATIONS .....	18
4.2 INTERPRETING THE GENERAL HEALTH INDICES .....	19
4.3 PHYSICAL FITNESS TEST BATTERY INTERPRETATION .....	20
4.4 WRITTEN EXAMINATION RESULTS .....	20
4.5 ALTERNATIVE TESTS .....	20
4.6 REASONABLE ACCOMMODATION .....	21
CHAPTER 5: EXERCISE PRESCRIPTION .....	22
5.1 PRINCIPLES OF CONDITIONING .....	22
5.2 CARDIOVASCULAR (AEROBIC) ACTIVITIES .....	22
5.3 FLEXIBILITY .....	23
5.4 MUSCULAR FITNESS: STRENGTH AND ENDURANCE .....	24
5.5 BODY COMPOSITION AND WEIGHT CONTROL .....	25
CHAPTER 6: COUNSELING .....	27
6.0 INTRODUCTION .....	27
6.1 ESTABLISH RAPPORT .....	27
6.2 DISCUSS TEST RESULTS .....	28
6.3 DISCUSS ACTIVITY PREFERENCES AND INTERESTS .....	28
6.4 ESTABLISH GOALS .....	29
6.5 EXERCISE PROGRAM REVIEW: ADJUSTING THE PLAN TO MEET GOALS ...	29
6.6 EXERCISE-RELATED INJURIES .....	29
6.7 GETTING STARTED .....	30
REFERENCES .....	31
EXHIBIT A: PHYSICAL FITNESS TESTING EQUIPMENT .....	33
EXHIBIT B: EMERGENCY EQUIPMENT AND PROCEDURES .....	35
EXHIBIT C: SAMPLE CERTIFICATES OF RECOGNITION .....	37
EXHIBIT D: .....	43
INFORMED CONSENT FORM .....	45
PHYSICIAN'S LETTER and CLEARANCE FORM .....	47
PERQ .....	49
MEDICAL INFORMATION RELEASE FORM .....	51
RISKO .....	53
EXHIBIT E: .....	55
PHYSICAL FITNESS TEST BATTERY SCORE SHEET .....	57
PERSONAL FITNESS PLAN .....	59
EXHIBIT F: INSTRUCTIONS FOR ADMINISTERING AND SCORING THE WRITTEN EXAMINATION .....	61
EXHIBIT G: ACSM POSITION STAND .....	63
EXHIBIT H: COUNSELING AIDS .....	75

# 1: INTRODUCTION

## 1.0 PROGRAM CONTENTS

The POST In-Service Physical Fitness Program is designed to encourage officers to achieve and maintain exemplary levels of physical fitness. **It is aimed at individuals at all fitness levels**, is based on current principles of exercise science, and is designed to be safe and effective while requiring only a minimum level of staffing, equipment and facilities.

The program is described in two manuals: a Fitness Coordinator's Manual (this manual) and an Officer's Manual. The Fitness Coordinator's Manual covers administrative considerations including program implementation and setup. The Officer's Manual covers key concepts in the areas of physical conditioning, self-assessment, nutrition, and weight control.

Participation in the program consists of four major activities. They are:

- pre-screening
- fitness assessment and recognition
- learning about physical fitness
- designing and using a personal fitness program

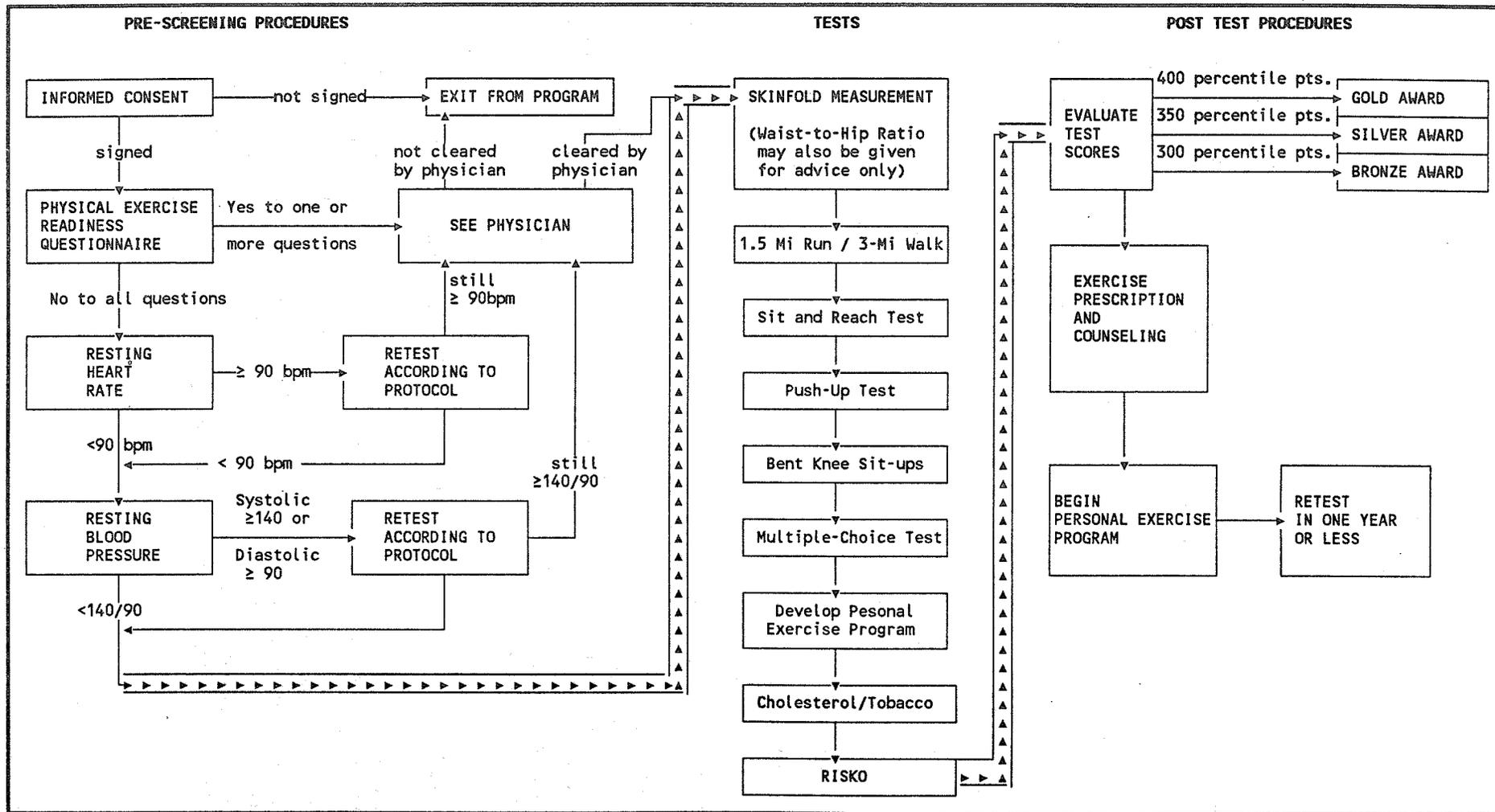
## 1.1 HOW DOES THE PROGRAM WORK?

First, all participants must complete a health risk appraisal and, if indicated, see a physician. Following this appraisal, each participant enters the program and completes a test battery. The fitness coordinator then reviews all test scores to determine current fitness level and meets with each participant to discuss his/her individual test results and what the scores mean for the development of a personal exercise program. Participants then implement their individual programs. The flow chart on page 2 shows the major program activities and how they fit together.

## 1.2 WHAT QUALIFICATIONS SHOULD THE FITNESS COORDINATOR HAVE?

As indicated above, the program consists of pre-screening, administration and interpretation of tests, and counseling. The fitness coordinator need not be an expert in exercise physiology or nutrition; however, it is important that he/she be qualified to carry out the program in terms of participant safety, accuracy in interpreting test results and making recommendations which will guide the participants toward positive lifestyle changes. It is recommended that the fitness coordinator know the basics of exercise physiology, fitness assessment, exercise prescription, nutrition, and motivational counseling. This manual is intended to train the coordinator in certain aspects of these areas so that he/she will be prepared to carry out the program in a professional and standardized manner.

## POST IN-SERVICE PHYSICAL FITNESS PROGRAM FLOW CHART



All fitness coordinators and all persons who assist in proctoring the fitness battery should be currently certified in first aid and cardiopulmonary resuscitation (CPR).<sup>1</sup> Courses are offered by the American Heart Association and the American Red Cross.

### **1.3 WHAT IS THE FITNESS COORDINATOR'S ROLE?**

The physical fitness coordinator must accomplish the following tasks:

1. Advertise the program
2. Obtain needed equipment and facilities
3. Conduct orientation sessions
4. Conduct/oversee pre-screening
5. Conduct/oversee fitness assessment
6. Interpret fitness scores
7. Counsel participants regarding exercise
8. Administer awards
9. Keep records

Each of these responsibilities is discussed below.

### **1.4 HOW DO I ADVERTISE THE PROGRAM?**

The initial responsibility of the fitness coordinator is to get the program started. This means getting the word out and inviting everyone to participate. A number of successful techniques that have been used to begin new fitness programs include the following:

- Send a bulletin to all personnel from the chief/sheriff
- Use a general or special order
- Send a personal memo from the chief/sheriff or the city manager announcing the program and encouraging participation
- Roll call announcement
- Send a note with payroll checks

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<sup>1</sup>This requirement is consistent with the Standards and Guidelines for Health and Fitness Institutions published by the American College of Sports Medicine (1992), the Industry Standards for Health and Fitness Facilities published by the Association of Quality Clubs (1993) and section 8.3.1 and 8.3.2 of POST's Guidelines for Student Safety in Certified Courses (1990).

- Post signs and posters throughout the department
- Personal contact
- Media coverage
- Roll call videos
- Start the program as a pilot effort and ask for volunteers

The coordinator should use whatever appropriate resources are available. The objectives are to get the word out and to get people interested.

## 1.5 WHAT FACILITIES, SERVICES AND EQUIPMENT ARE NEEDED?

Facilities. The test battery should be administered in a comfortable atmosphere. A well-lit and well-ventilated room should be provided. Ideally, the temperature in the room should not exceed 72° F. Emergency procedures should be established, including ensuring the availability of a phone in or near the testing area. Dressing rooms and shower facilities should also be located near the testing area.

The 1.5 mile run or 3 mile walk cardiorespiratory tests should be administered on a well maintained track. If there is no track available, an outside area which is flat and free of obstacles will suffice. Smooth, grassy surfaces are preferable over pavement.

Services. The fitness coordinator must also make arrangements for all participants to have their cholesterol levels assessed. This will involve locating an appropriate facility and, if economically feasible, making arrangements to pay for the service. It is preferable that the cholesterol test include an evaluation of HDL and LDL cholesterol. As discussed in a later section, all participants are required to know their cholesterol level and what can be done to modify this value if necessary.

Testing Equipment. The equipment needed to administer the program is generally inexpensive and easily obtained. A list of the needed items is provided in exhibit A.

Emergency Equipment and Procedures. It is very important that the fitness coordinator and all staff involved in administering the fitness tests be familiar with emergency and first aid procedures. An inventory of recommended equipment and emergency procedures is shown in exhibit B. POST strongly recommends that these or similar emergency provisions be implemented. Each agency is encouraged to review emergency procedures with local medical personnel.

## 1.6 WHAT HAPPENS IN THE ORIENTATION SESSION?

At the beginning of the program the fitness coordinator schedules and conducts one or more orientation meetings in which the basics of the program are explained. Each potential participant is given a copy of the pre-screening forms, a RISKO form and a POST In-Service Physical Fitness Program Officer's Manual. All questions posed by potential participants are answered.

## **1.7 HOW DO I CONDUCT THE PRE-SCREENING?**

Screening individuals prior to participation is a necessary and very important part of the program. For most people, physical activity should not pose any problem or hazard. It is necessary, however, to identify all individuals for whom physical activity and/or testing may be inappropriate. Thus, screening procedures have been established which must be applied to all participants. Please note that these are minimal standards; each agency is encouraged to review these standards with local medical personnel to determine their appropriateness.

The program requires that two forms be completed and signed by each participant: 1) the Physical Exercise Readiness Questionnaire (PERQ), and 2) the Informed Consent form. In addition, measures of resting heart rate and blood pressure are also obtained prior to testing. Each of these procedures is described in detail in chapter 2.

Your role in the screening process is to provide the necessary forms, assist participants in completing the forms, assess their resting heart rate and blood pressure and direct them to a physician when indicated.

## **1.8 HOW AND WHEN DO I CONDUCT THE FITNESS ASSESSMENT?**

The fitness assessment consists of administering a group of five (5) physical tests and one (1) fitness knowledge test to each participant. These tests, described in chapter 3, are administered to each participant a minimum of once per year, on or near the anniversary date of initial participation in the program. The assessment is conducted immediately following the pre-screen when the participant first signs up for the program. Where agency resources permit, follow-up assessment may be scheduled in three or six month increments, or when a participant feels that he/she is ready to test for the next fitness level.

## **1.9 HOW DO I INTERPRET FITNESS TEST SCORES?**

The interpretation of scores on each test requires a basic understanding of the fitness component measured by the test, why each component is important, and what a given score on each test means. A discussion of each fitness component, the relevant test, and how to interpret scores on the test is presented in chapters 3 and 4.

## **1.10 HOW DO I COUNSEL PARTICIPANTS ABOUT EXERCISE?**

A primary function of the fitness coordinator is to assure that participants understand the basic principles of physical conditioning and adopt personal fitness programs that are safe and effective.

The preparation of personalized fitness programs should be relatively easy because the Officer's Manual contains simple explanations of the components of fitness and specific activities that are appropriate for improving each component. The fitness coordinator's role as counselor is to help the participant select activities which are appropriate for improving (or maintaining) his/her current fitness level. By assisting the participant, the coordinator additionally assures that each individual understands and appropriately applies the principles of conditioning regarding the proper frequency, duration and intensity of exercise.

Techniques for counselling participants and helping participants develop personal fitness programs are explained in chapter 6.

### **1.11 WHAT ARE THE AWARDS AND HOW DO I ADMINISTER THEM?**

This program recognizes three levels of award which correspond to specific performance levels on the fitness test battery. A bronze, silver, and gold award structure has been established to correspond to the 60th, 70th and 80th performance percentiles, respectively. The required performance criteria are based on established norms for different age and gender groups.

In order to be recognized, participants must achieve a certain score on each test, and must know and understand their cholesterol level. In addition, the silver level requires abstinence from tobacco for at least the two preceding months, while the gold level requires that the individual be tobacco free during the preceding year. The specific levels of performance required to qualify for each award are described in chapter 3.

### **1.12 HOW DO I RECOGNIZE FIT OFFICERS IN MY AGENCY?**

Three sample Certificates of Recognition are included in exhibit C. Local coordinators may use these or similar forms to recognize those officers who meet or exceed the POST fitness standards.

In addition to, or in place of certificates, coordinators should explore the possibility of offering other types of incentives for individuals to become involved in the program. Incentives that have been used successfully in some agencies include: direct monetary payment, time off (e.g., bonus vacation days), time to workout on duty, membership in health spas and fitness clubs, T-shirts, hats, athletic bags, and lapel pins. Coordinators are encouraged to seek out and obtain whatever incentives are feasible.

### **1.13 WHAT RECORDS DO I NEED TO KEEP?**

The effective management of any program requires record keeping, and this program is no different. Among the records that you will need to keep are:

- Records showing when and how the program began
- Records of each individual participant's pre-screening, fitness test scores, and counseling sessions
- Records of equipment purchases and maintenance
- Records of who received what awards and when

An expanded discussion of the records you should keep is provided in section 3.5 of chapter 3.

## 1.14 WHAT DO I DO IF I HAVE QUESTIONS?

The first responsibility of the fitness coordinator is to become completely and thoroughly familiar with the program. The only way to accomplish this is to read this manual and the accompanying POST In-Service Physical Fitness Program Officer's Manual. Both documents should be read from cover-to-cover, for they describe the entire program and contain answers to most of the questions you may have.

Also, there are several easy-to-read texts on physical conditioning, diet, nutrition and related topics included in the reference section of this manual. Acquisition and study of these references will help increase your knowledge and effectiveness as a fitness coordinator.

If you still have questions after you have comprehensively studied both manuals, call the POST Standards and Evaluation Services Bureau at (916) 227-4820.

## 2: PRE-SCREENING

### 2.0 INTRODUCTION

Appropriate screening of individuals prior to participation in the program is an essential safety precaution. It is a tool to identify persons at risk for injury during fitness testing and subsequent exercise programs. It also aids in prescribing the appropriate type of exercise for an individual. If an individual is screened out during this preliminary phase, he/she should be referred to a physician for medical evaluation. A signed clearance from a physician (who has been clearly informed of the nature of the tests and training program) is then necessary for the individual to begin the program.

The pre-screening includes the following procedures:

#### Prior to testing:

- Completion of Informed Consent form
- Completion of Physical Exercise Readiness Questionnaire

#### On the day of testing:

- Assessment of resting heart rate
- Assessment of resting blood pressure

A brief explanation of each of these procedures follows.

### 2.1 INFORMED CONSENT

Before permitting program participation, informed consent must be obtained from the participant. The informed consent includes a written and verbal explanation of the program. The purpose of the informed consent is to ensure that the participant clearly understands the nature of the test battery and what his/her responsibilities are with respect to performing the tests and participating in the program. The form, signed and dated by both the participant and the fitness coordinator, makes it clear that the participant can refuse to perform any of the tests and may stop performing a test at any time for any reason. The informed consent form also serves as a medical information release through which the participant grants his/her agency access to all medical information collected in the program.

A sample informed consent form is shown in exhibit D. You may copy this form and use it, or you may modify it to meet your agency's own specific needs. This form should be reviewed by your agency's legal counsel.

## 2.2 PHYSICAL EXERCISE READINESS QUESTIONNAIRE (PERQ)<sup>2</sup>

The PERQ is designed to identify those individuals for whom certain physical activities may be inappropriate and/or those who should receive medical advice pertaining to the type of activity most suitable for them. A copy of the PERQ is provided in exhibit D.

In particular, persons with certain conditions which could be aggravated by exercise or exercise testing should not begin the program unless medical authorization and/or supervision is provided.

Encourage participants to read the PERQ carefully, follow the instructions, and answer each question. The PERQ must be administered without interpretation, although the following are some terms that may need clarification IF the participant asks:

- "Heart Trouble": a deliberately broad term used to include heart attacks, angina, congenital heart disease, congestive heart failure, and the use of heart medications.
- "Dizziness": frequently referred to as "light-headedness," it is usually associated with the sensation or feeling of instability.
- Terms such as "frequently" and "often" have been purposely used in an attempt to identify respondents for whom the fitness program is inappropriate. Some individuals may have difficulty in dealing with these terms. It is very important that the fitness coordinator not interpret the participant's symptoms. The coordinator should help participants answer the questions by asking that they make the judgment on their own.

If the response to any of the questions on the PERQ is "YES," the individual must not be allowed to participate in any aspect of the program unless cleared to participate by a physician.

A letter is provided in exhibit D which the coordinator can give to the participant to take to his/her physician. The letter describes the program and includes a clearance form. Also in exhibit D is a Medical Information Release Form which, when signed, authorizes the physician to release the participant's medical information to the fitness coordinator. The participant must sign and give this form to his/her physician.

## 2.3 RESTING HEART RATE

Resting heart rate is an indicator of the work of the heart at rest. Any significant elevation in heart rate ( $\geq 90$  beats/min) could be a sign of underlying heart problems, stress or even pre-test nervousness.

A stopwatch or timer is needed to measure resting heart rate. Have the participant sit in a comfortable chair with arm supports and rest with his/her feet flat on the floor for at least five minutes prior to measuring resting heart rate. Locate the pulse in either the radial artery (wrist) or carotid artery (neck). Do not palpate (i.e., apply pressure to) both carotid arteries at the same time. Count the heart rate for 20 seconds and multiply by three. Record the resting heart rate in the space provided on the Physical Fitness Test Battery Score Sheet (see exhibit E).

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<sup>2</sup> The PERQ is an adaptation of the American Heart Association Modified Physical Activity Readiness Questionnaire.

If the participant's resting heart rate is 90 beats per minute or more, wait an additional five minutes (have the individual sit quietly) and repeat the measurement.

A participant should not be permitted to take any physical fitness tests or begin an exercise program if his/her resting heart rate is 90 beats per minute or more after two readings.

If this occurs, briefly explain that the resting heart rate reading is not within the range considered safe for exercise. Record the person's name and resting heart rate in the appropriate place on the Physician's Letter (see exhibit D) and proceed to take the individual's resting blood pressure. After the person's resting blood pressure has been taken and entered on the Physician's Letter, instruct the person to take the letter along with his/her completed PERQ and a signed Medical Information Release Form (see exhibit D) to a physician to obtain a clearance to participate.

NOTE: The individual's resting blood pressure readings must be entered on the Physician's Letter even if they are within acceptable limits (see below).

## 2.4 RESTING BLOOD PRESSURE

NOTE: Blood pressure should preferably be evaluated by an EMT1 or a person with substantial experience and training.

Abnormal resting blood pressure could be a sign of underlying heart problems, stress or even pre-test nervousness.

The resting blood pressure measurement should be taken following the resting heart rate measurement. To measure resting blood pressure, you will need a sphygmomanometer (blood pressure cuff) and stethoscope. Apply the blood pressure cuff to the participant's left arm. The cuff should be wrapped firmly and smoothly around the arm with the lower margin two to three centimeters above the antecubital space (inner elbow). The arm should be comfortably supported at an angle of 10 to 45 degrees from the trunk with the lower edge of the cuff at heart level. Locate and note the brachial artery at the inner elbow by palpation. The stethoscope should be positioned so that the earpieces point forward.

Position the diaphragm of the stethoscope over the brachial artery. Apply a minimum amount of pressure so as not to distort the artery. The diaphragm should be in complete contact with the skin. Inflate the cuff to approximately 180 mmHg (for individuals with high blood pressure, the cuff may need to be inflated to 200 mmHg). The stethoscope should not touch the cuff or its tubing. Release the cuff pressure at a rate of approximately two mm per second.

The systolic pressure is determined by the first perception of sound (first Korotkoff sound). The diastolic pressure is determined by the last perception of clear tapping sounds (not muffled). Deflate the cuff to zero pressure.

Record the resting systolic and diastolic pressures to the nearest two mmHg in the appropriate space on the Physical Fitness Test Battery Score Sheet (see exhibit E).

If the resting systolic blood pressure is 140 mmHg or more and/or the resting diastolic pressure is 90 mmHg or more, wait an additional five minutes (have participant wait quietly) and repeat the measurement.

A participant should not be permitted to take any physical fitness tests or begin an exercise program if:

- the resting systolic pressure is 140 mmHg or more after two readings, or
- the resting diastolic pressure is 90 mmHg or more after two readings.

If either or both of these readings occur, briefly explain that the blood pressure readings are not within the range considered safe for exercise. Write the person's name and resting heart rate and blood pressure readings in the appropriate places on the Physician's Letter (see exhibit D) and instruct the person to take the letter and a signed Medical Information Release Form to a physician along with his/her completed PERQ to obtain a clearance to participate.

NOTE: The coordinator must enter the person's resting heart rate reading on the Physician's letter, even if the heart rate reading is acceptable.

## **2.5 REFERRING THE PARTICIPANT TO A PHYSICIAN**

A participant must pass all pre-screening procedures before beginning the program.

- IF** the participant answers YES to any question on the PERQ,
- OR** has a resting heart rate  $\geq 90$  after two readings,
- OR** has a resting systolic blood pressure of  $\geq 140$  or a resting diastolic blood pressure of  $\geq 90$  after two readings,
- THEN** write the person's resting heart rate and resting blood pressure in the appropriate places on the Physician's Letter,
- AND** instruct the participant to bring the letter along with a copy of his/her completed PERQ and a signed Medical Information Release Form to a physician to obtain a clearance to participate.

## **2.6 CONFIDENTIALITY OF FITNESS PROGRAM INFORMATION**

Because participation in the program requires the disclosure, accumulation and maintenance of medical information, procedures must be followed to assure the confidentiality of such information.

The disclosure of peace officer medical information is governed by two sets of statutes. First, the Confidentiality of Medical Information Act, Civil Code sections 56 et seq., protects the confidentiality of medical information regarding any person who has received health care services from a provider of health care. Second, Penal Code sections 832.7 and 832.8 provide that peace officer personnel records, or information obtained from these records are confidential and cannot be disclosed in any criminal or civil proceeding (except by discovery pursuant to sections 10-13 and 10-48 of the Evidence Code).

The Confidentiality of Medical Information Act prohibits a provider of health care from disclosing medical information regarding a patient of the provider without first obtaining authorization from the patient. For purposes of the Act, medical information is defined as any individually identifiable information in

possession of or derived from a provider of health care regarding a patient's medical history, mental or physical condition, or treatment (Civil Code section 56.05(b)).

Because the Medical Clearance form, to be signed by the physician, requires the physician to disclose medical information as defined in sections 56.05(b), the officer's authorization permitting the physician to disclose the information must be obtained.

The authorization for release of medical information by the physician is valid only if it meets the requirements specified in Civil Code section 56.11. That section provides that the authorization must meet the following requirements:

- "(a) Is handwritten by the person who signs it or is in typeface no smaller than 8-point type.
- "(b) Is clearly separate from any other language present on the same page and is executed by a signature which serves no other purpose than to execute the authorization.
- "(c) Is signed and dated by one of the following:
  - "(1) The patient . . .
- "(d) States the specific uses and limitations on the types of medical information to be disclosed.
- "(e) States the name or functions of the provider of health care that may disclose the medical information.
- "(f) States the name or functions of the persons or entities authorized to receive the medical information.
- "(g) States the specific uses and limitations on the use of the medical information by the persons or entities authorized to receive the medical information.
- "(h) States a specific date after which the provider of health care is no longer authorized to disclose the medical information.
- "(i) Advises the person signing the authorization of the right to receive a copy of the authorization."

To comply with the above restrictions, the medical clearance form to be signed by the physician must be accompanied by an authorization signed by the officer in the form and content required by section 56.11. The form in exhibit D entitled Medical Information Release Form (Authorization For the Release of Medical Information To My Agency) was developed to meet this requirement.

Also, under section 56.20(a) of the Confidentiality of Medical Information Act, each employer who receives medical information is required to establish appropriate procedures to ensure the confidentiality and protection from unauthorized use in disclosure of that information. In order to meet the requirements of the Confidentiality of Medical Information Act and Penal Code Sections 832.7 and 832.8, the fitness coordinator must:

- a) keep all program information in a secure filing system;

- b) control access to the filing system to those who have a need to know and a right to know;  
and
- c) refrain from disclosing (in any manner, including informal discussion) any program information about any individual participant unless specifically authorized to do so by the participant.

## **3: FITNESS ASSESSMENT PROCEDURES**

### **3.0 INTRODUCTION**

Three (3) types of fitness assessment procedures are included in the program:

- 1) General Health Indices
- 2) Physical Fitness Test Battery
- 3) Fitness Knowledge Test

None of these procedures should be administered until after the participant successfully completes the pre-screening requirements presented in chapter 2.

Each test is to be administered according to the procedures described in this chapter. The resulting scores should be recorded on the Physical Fitness Test Battery Score Sheet (see exhibit E). The interpretation of the scores is discussed in chapters 4 and 5.

### **3.1 GENERAL HEALTH INDICES**

Three assessments are made of the participant's general health: RISK0, tobacco use, and cholesterol; each must be completed in order to qualify for any award level (bronze, silver, or gold).

#### **3.1.1 RISK0**

RISK0 is a short questionnaire that is based upon eight factors that have been identified as being significantly related to the development of heart disease. A copy of the form is included in exhibit D. Fitness coordinators should make copies of this form and provide a copy to each participant during the orientation.

Participants are required to complete the RISK0 form prior to their fitness assessment. If officers have questions about completing and interpreting the RISK0 form, the fitness coordinator should be prepared to answer them. Note: Individual scores on the RISK0 form have no bearing on the participant's eligibility for awards.

#### **3.1.2 Tobacco Use**

The coordinator asks when the participant last used tobacco of any form, including cigarettes, cigars, pipe tobacco, snuff or chewing tobacco. The participant's reply is recorded on the Physical Fitness Test Battery Score Sheet.

#### **3.1.3 Cholesterol**

The coordinator asks when the participant last had his/her cholesterol level checked, what the result was and what it means. The participant's reply is recorded on the Physical Fitness Test Battery Score Sheet. Note: If participants do not know their cholesterol level, or if they have not had it checked within the past year, then they must have it checked in order to qualify for any award.

## 3.2 PHYSICAL FITNESS TEST BATTERY

A physical fitness test battery comprised of measures of body composition, cardiovascular fitness, flexibility, and muscular fitness are administered to each participant. A brief description of each is presented below. Test protocols are given in attachment E of the Officer's Manual. Information pertinent to the interpretation of the test results is provided in chapter 4. All five tests in the battery must be administered within a 10-day period.

**Caution: Do not administer the physical fitness test battery under extreme temperature conditions or excessively humid conditions. Outdoor testing activities should be suspended when the Pollutant Standard Index (PSI) is above 100.**

### 3.2.1 Cardiovascular (Aerobic) Fitness

Cardiovascular fitness (also known as aerobic fitness, or cardiopulmonary, or cardiorespiratory fitness) refers to the ability of the heart, lungs and blood vessels to deliver adequate amounts of oxygen and nutrients to working cells during physical activity. Achieving and maintaining an appropriate level of aerobic fitness is considered a key ingredient in any physical fitness program.

This program contains two cardiovascular fitness tests: the 1.5 mile run and an alternative 3.0 mile walk; participants choose which one they want to take. Other measures of cardiovascular fitness may be used provided that reliable norms by age and gender exist. Questions concerning the availability or appropriateness of alternative measures may be addressed to POST.

### 3.2.2 Flexibility

Flexibility refers to the range-of-motion through which limbs or body segments 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 flexibility test in this program is the Sit-and-Reach Test.

### 3.2.3 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.

Two tests of muscular fitness are included in this program: Push-Ups (focusing on the upper body) and Bent-Knee Sit-Ups (focusing on the abdominal area).

### 3.2.4 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. Furthermore, as we

approach 50 years of age and beyond, it becomes increasingly important that we not only have sufficient lean muscular tissue, but that the fat is distributed appropriately.

In view of the importance of body composition, this program contains two body composition assessments: Percent Body Fat and Waist-to-Hip Ratio. However, scores on the Waist-to-Hip Ratio are advisory only.

As indicated, protocols (instructions) for setting up and administering each test in the fitness battery are provided in attachment E of the Officer's Manual; equipment needs are listed in exhibit A. A discussion on how to interpret test scores is given in chapter 4.

### **3.3 PHYSICAL FITNESS WRITTEN EXAMINATION**

A written fitness examination is also included in the program. This test consists of 25 multiple-choice questions of fundamental knowledge required to design a personal fitness program and develop a healthy life-style.

The concepts addressed in the multiple-choice exam include: the components of physical fitness, the principles of conditioning, the components of an exercise session, cholesterol, blood pressure, and the basics of body composition management (weight control). All of the questions in the multiple-choice test are based upon information contained in the Officer's Manual.

Instructions for administering and scoring the fitness knowledge test are provided in exhibit F. Guidelines for interpreting each individual participant's test scores are presented in chapter 4. Copies of the exam will be provided by POST upon written request.

### **3.4 PREPARATION OF A PERSONAL FITNESS PLAN**

The program requires that each participant design a personal exercise program. A form entitled "Personal Fitness Plan" is provided for this purpose (see exhibit E in this manual or attachment D of the Officer's Manual). Briefly, the form calls for the participant to list the activities that he/she proposes to utilize. Minimum requirements for the plan are as follows:

- It must address the following fitness objectives: flexibility, cardiovascular (aerobic) endurance, and muscular fitness.
- An exercise session must occur at least three times per week and include a warm-up, a conditioning period, and a cool-down.
- Each session must be at least 30-minutes in duration, and contain safe activities that are designed to meet the above objectives.

Participants are encouraged to prepare this form ahead of time and turn it in to the coordinator at the time of the multiple-choice fitness knowledge test.

### 3.5 SCORING AND AWARD STRUCTURE

The program uses an award structure which is based on percentile scores referenced to age and gender. The program recognizes officers who reach the performance levels shown in the chart below.

Normative scoring tables based on age and gender are provided in appendix F of the Officer's Manual. These tables must be used when determining an individual's award status.

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 five tests; percentiles are in 5% increments.)		

### 3.6 RECORD KEEPING

Fitness coordinators should prepare a program file for each participant who enters the program. The file should contain the following items:

- a signed Informed Consent form
- a completed PERQ
- physician's clearance (if needed)
- the Physical Fitness Test Battery Score Sheets (accumulated over time)
- a copy of the RSKO form
- a copy of the Personal Fitness Plan form

In addition to the participant files, coordinators should also keep records of equipment purchases, participant injuries, when and how the program began, lists of medical personnel involved in the program, details of any arrangements made for blood cholesterol tests, etc., and documentation for any alternative tests used in the program.

## 4: INTERPRETING RESULTS

This chapter provides information on how to interpret the results of the various fitness assessments made in the program.

### 4.1 PRE-SCREENING INTERPRETATIONS

Informed Consent Form. This form describes the nature of the program and outlines the participant's responsibilities. Before participants sign the form, the fitness coordinator should confirm that it is fully understood. This could lead to some questions about the various test items, exercise requirements, awards, etc. All questions should be welcomed because they provide an opportunity for dialogue and a chance to build rapport and gather information which can be important for an effective counseling session. The Informed Consent form is located in attachment A of the Officer's Manual and exhibit D of this manual.

Physical Exercise Readiness Questionnaire (PERQ). Participants with only "NO" responses are cleared, while those with one or more "YES" responses must be given a Physician's Letter and a Medical Information Release Form and instructed to take it along with their completed PERQ to a physician.

For those individuals who are instructed to see a physician, no attempt should be made to discern or discuss why the participant had a "YES" response.

Resting Heart Rate Measurement. Participants screened out due to a high resting heart rate (i.e.,  $\geq 90$  beats/min) should be referred to a physician in much the same manner as those identified by the PERQ. At the time of the referral, they should be encouraged to return with written clearance to participate from their physician. This clearance is necessary to participate in the program. Since the resting heart rate reflects the rate that the heart must pump to supply oxygenated blood to the tissues, an elevated value suggests that the heart may be working excessively hard.

Because nervousness in anticipation of testing could elevate heart rate, it is important to deal with any concerns participants may have prior to measurement. A few minutes of informal conversation or a tour of the testing area can do much to calm apprehensive individuals.

Resting Blood Pressure Measurement. Blood flows through the vascular system due to pressure generated by the heart as it contracts. The pressure is maintained by elastic tissue in the arterial walls. Contraction of the heart forces blood out of the left ventricle into the aorta which branches into various arteries.

The contraction phase of the ventricles is referred to as systole; hence, the upper blood pressure reading is designated as systolic blood pressure. The relaxation phase of the cardiac cycle is referred to as diastole. The lower blood pressure reading is thus called the diastolic blood pressure. It is a reflection of the resistance to blood flow by the arterial wall.

While it is difficult to define what normal blood pressure is, a systolic blood pressure of 120 mmHg and a diastolic blood pressure of 80 mmHg are considered average. Section 2.4 on page 11 outlines the blood pressure limits above which participants should not be permitted to take the tests or begin the exercise program without clearance from a physician.

Many conditions can cause resting blood pressure to be elevated above the average resting value. Anxiety, for example, can cause a transient increase in blood pressure. The appraiser should learn to recognize when a participant is uncomfortable in the fitness appraisal setting and take steps to alleviate his/her concerns. By taking time to explain the appraisal procedure generally (or blood pressure measurement specifically) and answer questions, the participant's anxieties can be minimized.

## 4.2 INTERPRETING THE GENERAL HEALTH INDICES

**RISKO.** As indicated, RISKO is a short questionnaire that is based upon eight factors that medical science has identified as being significantly related to the development of heart disease. RISKO is used in this program for "information" purposes only. The intent is to make everyone aware of his/her relative risk for heart trouble so that, if it is high, they can begin to do something to reduce it.

Coordinators should not underestimate the contribution that RISKO can have in helping officers become aware of their risk for cardiovascular disease. In fact, five of the factors listed in RISKO are used as specific criteria in this program: body composition, tobacco use, cholesterol, exercise and blood pressure (during the pre-screen).

It is important to note that the five RISKO factors addressed in the program can be controlled (at least to some degree) by the individual. These factors are shown in Table 1. Participants should know what these factors are and that they can reduce their risk by taking charge of them. The form itself (see exhibit D) shows how the factors "add-up" to show one's degree of risk, and in so doing demonstrate fairly clearly how one's overall risk can be reduced.

The three factors that are not controllable (i.e., age, sex, and heredity) are fairly easy to interpret, namely:

- the older you get the higher your risk;
- the more close relatives with heart disease, the higher your risk; and
- males have a higher risk than females.

<b>Table 1: RISKO Factors</b>	
<b>Controllable Risk Factors</b>	<b>Uncontrollable Risk Factors</b>
Tobacco Use	Heredity
Exercise	Sex
Cholesterol	Age
Blood Pressure	
Body Composition	

**Tobacco Use.** The coordinator asks when the participant last used tobacco of any form, including cigarettes, cigars, pipe tobacco, snuff or chewing tobacco. Participants must be told that they cannot advance to the silver level if they have used tobacco in any form during the preceding two months and that the gold level requires abstinence for the preceding twelve months. Current users should be referred to page 26 in the Officer's Manual and encouraged to seek professional help if they are having trouble stopping.

**Cholesterol.** Individuals reporting high cholesterol levels should be advised to have their cholesterol checked a second time. If after a second reading it is still high, the individuals should be advised to talk to their physicians. Participants should also be instructed to read pages 26-28 of their manual, which contains a discussion about cholesterol and what they can do to help reduce or control it.

### **4.3 PHYSICAL FITNESS TEST BATTERY INTERPRETATION**

When interpreting the results of the fitness battery, it is important to remember that the individual's age and gender must be taken into account. Scores which would indicate relatively poor condition for one group may mean excellent physical condition for another group. Norm tables for each test by age and gender are provided in attachment F of the Officer's Manual. If alternative tests are used (e.g., bike ergometers), then copies of the protocols and norms for such tests must be acquired and added to the Officer's Manual.

The norm tables in the Officer's Manual are given in terms of percentiles, which make it easy to compare an officer's score to those of persons in his/her own age group. When dealing with percentile scores, it is always helpful to remember that the 50th percentile is the average for the group of interest.

The correct interpretation of the scores in the norm tables is that a score at any given percentile is the score that was achieved by that percent of the population. In other words, a person who scores at the 75th percentile has scored better than 75 percent of the people in his/her gender and age group. For example, (referring to pages 65-66 in attachment F of the Officer's Manual), a 25-year-old female would need a time of 13:53 (thirteen minutes and fifty-three seconds) on the 1.5 Mile Run to reach the silver level, whereas a 40-year-old male would need a time of 12:34 to reach the silver level.

### **4.4 WRITTEN EXAMINATION RESULTS**

Unlike the physical fitness tests, the multiple-choice examination is not scored according to age and gender. Everyone is required to score at least 80% to achieve any award (gold, silver, or bronze). Scores on the test indicate the participant's level of understanding of the principles of conditioning, self-assessment, nutrition, and weight control. Questions on the test are taken from the information contained in the Officer's Manual. Coordinators should carefully review the test answers of those participants who score less than 80% so that these individuals can be counseled in the area(s) they are having trouble with. All participants should be given additional opportunities to pass the test. The objective of the test is to teach participants about health and fitness concepts. Coordinators should always keep this objective in mind when administering the written exam portion of the program.

The Personal Fitness Plan form (see exhibit E) provides a means for officers to further demonstrate that they understand how the principles of exercise are applied. They do this by actually developing their own exercise programs. Coordinators must review all proposed programs carefully to determine if they are safe and effective. Feedback consultations should be scheduled with each officer to affirm the appropriateness of their proposals and/or to correct deficiencies. To be effective, the feedback should occur as soon after the administration of the tests as possible.

### **4.5 ALTERNATIVE TESTS**

It is permissible to substitute alternative tests for those specified in the program provided that: (1) the new test assesses the same fitness component as the original test, and (2) valid test score norms are available by age and gender for the new test. With respect to the latter, scores corresponding to the 80th, 70th, 60th and 50th percentile for each age/gender group must be available.

#### **4.6 REASONABLE ACCOMMODATION**

To the extent that the fitness program is considered a benefit or privilege of employment, the Americans with Disabilities Act of 1990 (ADA) requires employers to make reasonable accommodations to persons with disabilities. This means that the program must not be restricted to individuals by virtue of their disability status; that is, they must be given an equal opportunity to participate in program activities.

An employer's obligation in this regard would appear to include: (1) ensuring that disabled individuals have equal access to the program, and (2) when/if appropriate, entertaining forms of reasonable accommodation to enable an employee to earn program awards/incentives by means of alternative activities that accomplish the same purpose (e.g., bike ergometer test versus running to demonstrate cardiovascular endurance).

Questions about how the ADA may relate to this in-service physical fitness program should be directed to the POST Standards and Evaluation Services Bureau at (916) 227-4820.

## 5: EXERCISE PRESCRIPTION

Each participant in the program is expected to develop and implement a personal exercise program. This chapter provides guidelines that the fitness coordinator can use to assist participants in selecting appropriate exercise activities to maximize the benefits derived from their individual programs.

### 5.1 PRINCIPLES OF CONDITIONING

Research has shown that there are a number of well established general physical conditioning principles. An understanding of these principles is necessary in order to effectively administer the program. These principles are discussed on pages 6-9 of the Officer's Manual. Coordinators should review this material carefully so that they can help participants design and maintain effective personal exercise programs. Exhibit G contains a reprint of the American College of Sports Medicine's position stand on the recommended types and amounts of exercise for healthy adults. This reprint (which is a bit technical but generally understandable by lay persons) contains a summary of the extensive research that has been conducted in this area. It is strongly recommended that the fitness coordinator review this material in order to gain an understanding of the scientific basis for the principles of conditioning that form the foundation of this program.

### 5.2 CARDIOVASCULAR (AEROBIC) ACTIVITIES

When considering appropriate aerobic exercise for an individual, it is very helpful to keep the "FITTE" factors in mind. The FITTE factors, which are discussed in detail on pages 10-11 of the Officer's Manual, are:

- Frequency:** Aerobic exercise should be performed three to five times per week. Beginning exercisers should begin with three days per week and may gradually increase to five days per week. For persons interested only in cardiovascular health, three days per week is sufficient. However, for persons interested in decreasing their body fat percentage, a five day per week program at low intensity is recommended.
- Intensity:** For maximum aerobic benefit, aerobic exercise should be performed in the training heart rate range (see attachment H, page 77, of the Officer's Manual). For individuals seeking to reduce their body fat percentage, exercise at the lower end of their training heart rate range for longer periods of time is recommended.
- Time:** There are three components to a healthy cardiovascular program. First, the warm-up period should consist of 5 to 10 minutes of walking/jogging followed by stretching of the major muscles. Then the conditioning exercises should be performed for 20 to 40 minutes (beginning exercisers should start at 20 minutes and gradually increase to 40). The cool-down period should consist of 3 to 5 minutes of light activity to allow the heart rate to gradually decrease (e.g., walking) and again, 5 to 10 minutes of stretching. Note: Individuals seeking to reduce their body fat will burn more calories by exercising longer (up to 60 minutes) at the low end of their training heart rate range.
- Type:** The activities of choice are those which involve continuous, repetitive use of large muscle groups, such as walking, jogging, running, cycling, swimming, cross-country

skiing, and aerobic dance (each of these is discussed in attachment I in the Officer's Manual).

Combinations of activities may be chosen, for example: jogging on Monday, Wednesday, and Friday; swimming on Tuesday and Thursday. This method of training is referred to as cross-training. It has the benefits of training more muscle groups, decreasing the incidence of injury, and increasing variety and enjoyment. Cross-training is recommended especially for those who exercise more than three days a week.

It is recommended that the participant occasionally perform the 1.5 Mile Run (or the alternative 3.0 Mile Walk) to help enhance performance on this test.

**Enjoyment:** This is a very important factor in exercise prescription. Although the above factors (frequency, intensity, time, and type) are necessary to improve cardiovascular condition, it will be difficult, if not impossible for the officer to remain committed to his/her program unless the activity is one that he/she enjoys.

### **5.3 FLEXIBILITY**

Flexibility is defined as the range of possible movement in a joint or series of joints. A variety of factors affect this component, and individuals vary in the degree of flexibility they possess. 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 of the surrounding muscles, the pliability of connective tissue, and the structure of the ligaments and tendons.

Muscles, fortunately, have a built in mechanism to help protect them from injury. Within the muscle, sensitive "spindles" monitor its length. When it is stretched, the spindle signals an increase in length, and a stretch reflex may be invoked causing the muscle to contract in an attempt to prevent overstretching and injury.

The key in flexibility development is to remember that the stretch reflex is rate sensitive. If a slow, gentle or stretch-and-hold movement is performed, the stretch reflex will not be invoked, and the muscle can relax and lengthen as desired. However, fast, bouncy, or jerky movements will invoke the stretch reflex, causing the muscle to contract and shorten in an attempt to slow the movement and prevent injury.

To maintain or increase flexibility, stretching should be done before and especially after each exercise session. Remind participants that stretching can be done on non-exercise days at home in front of the television, or perhaps before bedtime.

Participants should be encouraged to occasionally perform the sit-and-reach stretch to check flexibility. They should reach for their toes slowly and hold for several seconds; then repeat.

A sensible stretching program avoids ballistic (bouncing, jerking, or quick moving) exercises. It emphasizes instead, gentle, stretch-and-hold movements followed by relaxation. The stretch should be

to the point of tightness -- a stretched, relaxed feeling. A sense of pain means overstretch is occurring and the exercise may be doing more harm than good. Holding the stretched position for 15 to 20 seconds is a good length of time to begin. The "hold" can be longer as programs progress. Attachment G in the Officer's Manual contains a recommended set of stretching exercises that can be performed nearly anywhere.

## 5.4 MUSCULAR FITNESS: STRENGTH AND ENDURANCE

Muscular strength and muscular endurance are two different capacities of a muscle. Muscular strength is defined as the maximum tension or force a muscle can exert in a single contraction. Weight-lifting is a classic activity demanding muscular strength. Combative encounters may require significant muscular strength.

Muscular endurance relates to the ability of a muscle to perform repeated contractions over a period of time. This quality is important in activities like running, cycling, swimming and cross-country skiing.

While few day-to-day activities require significant muscular strength, many of them demand endurance from a variety of muscle groups. Washing windows, cleaning floors, painting, gardening, raking leaves, and shoveling snow all require prolonged muscular exertion. If the muscles called into play in these activities are unaccustomed to repeated contractions, they will fatigue more quickly and will be more susceptible to potential injury or next day soreness.

Both muscular strength and endurance can be improved through either a weight training or calisthenics program. Although weight-lifting is generally preferred, it requires the use of expensive equipment and facilities which may be unavailable.

Calisthenics: Calisthenics can be performed before or after the cardiovascular conditioning session, or on alternate days to cardiovascular conditioning. Examples of calisthenic exercises are listed below; a recommended set of exercises is provided in attachment K (page 89) in the Officer's Manual.

Upper body exercises: push-ups, bicep curls, tricep extensions, pull-ups/chin-ups, bar dips.

Trunk exercises: crunches, reverse situps, back extensions, windmills.

Lower body exercises: leg lunges, leg lifts for inner and outer thigh.

Weight-training: Weight-training can also be performed before or after the cardiovascular conditioning session, or on alternate days to cardiovascular conditioning. To increase muscular strength, perform fewer repetitions with heavier weights; to increase muscular endurance, perform more repetitions with lighter weights. Examples of weight lifting exercises are listed below.

Upper body exercises: bench press, upright row, bicep curls, tricep extensions, lat pull-down.

Trunk exercises: (performed without weights) same as calisthenic exercises listed above.

Lower body exercises: leg press, toe press, leg extensions, hamstring curls, bar bell lunge.

There are several well written books on weight training listed in the reference section on page 31. Coordinators who wish to increase their expertise in this area are encouraged to acquire and study these references.

Also, the Officer's Manual discusses weight training on pages 12-13 and contains several tips for individuals who are beginning a weight training program.

## 5.5 BODY COMPOSITION AND WEIGHT CONTROL

Unfortunately, much of the information presently available on weight control is inaccurate, and the pursuit of "ideal weight" is often coupled with unrealistic expectations. Because of fads and fashions, the magazine/TV model is currently held up as having the ideal body. Some people come by a lean, thin figure naturally, and others can achieve it through perseverance and hard work, but many people -- given their genetic inheritance -- can never reach this so-called "ideal." The coordinator has an important role to play in discounting the myth of the perfect figure and encouraging participants to be sensible. The weight at which the individual is healthy, feels well, and is reasonably happy with his/her personal appearance is a realistic goal.

A big part of the problem in the past has been our almost total reliance on the bathroom scale as a sign of progress in weight management programs and as a guide for ideal body weight. The scale alone paints a less than complete picture for the individual. A program which includes regular physical activity can lead to a loss of fat-weight, a slight increase in muscle mass, and a trimmer, firmer figure with little overall loss in total body weight.

The emphasis should be on fat loss rather than weight loss. A certain amount of body fat is essential and protects vital organs. This is referred to as essential fat. The remaining non-essential fat represents stored energy in adipose cells just below the skin's surface and around internal organs.

It is now well recognized that both excessively high fat accumulation and excessive leanness increase risk to health. To classify individuals as being underweight or overweight requires a definition of a "normal" weight range. In the past, it has been common practice to define normal weight according to height and weight distribution within the general population.

The insurance industry has provided the primary data from which the traditional height-weight tables have been constructed. These tables have been sharply criticized in recent years since height and weight measures alone are poor estimators of body fatness and, in most cases, no anthropometric measurements of body frame size were made. In addition, since the groups used to develop height/weight tables consist of people accepted for life insurance policies, they cannot be considered representative of the general population. Moreover, the height/weight values for these people were usually obtained by asking the person rather than weighing them directly.

Also, the latest research indicates that where fat is located on the body, as well as how much body fat one has, is closely related to morbidity (incidence of disease) and mortality (incidence of death). There are two body types based on location of fat: a central fat pattern, where fat is concentrated in the upper body, abdominal and trunk regions (apple shape); and a peripheral fat pattern, where fat is located primarily in the hips, buttocks and thigh region (pear shape). Recent studies have shown that a centralized versus a peripheral pattern of fat distribution is more directly associated with abnormal

carbohydrate and fat metabolism and possibly high blood pressure. Thus, a person with an apple shape may be at significant risk for metabolic problems, such as hyperlipidemia (high levels of fats in the blood) and glucose intolerance (inability to metabolize blood sugar).

As indicated previously, the tests of body composition and fat distribution used in the program are skinfold measurement and waist-to-hip ratio. To reduce health risk, it is generally recommended that males have a waist-to-hip ratio less than .9, with percentage body fat in the range of about 6% to 15%. Females should have a waist-to-hip ratio of less than .8 with a percentage of body fat in the range of 8% to 23%.

A program of regular aerobic exercise will do much to maintain lean tissue and promote fat loss. To direct the exercise program toward one of fat loss (as well as cardiovascular conditioning), the participant should stay in his/her lower training heart rate range (60% to 70%, depending upon fitness level) so that the activity can be sustained for a longer period of time (30 to 60 minutes). The participant should gradually work toward a five day per week program to burn additional calories.

In addition to regular aerobic exercise, participants who need to reduce body fat should be encouraged to review their eating habits and monitor their food intake. Attachment L in the Officer's Manual provides valuable information and helpful techniques to aid persons in controlling their body composition.

## 6: COUNSELING

### 6.0 INTRODUCTION

A major role of the fitness coordinator is to serve as a resource person or "coach" for program participants. That is, to motivate individuals to succeed in the program and to provide sound advice on exercise and fitness. In order to do this, the coordinator needs to be able to establish rapport with each participant, to communicate the results of the fitness assessment, and to help individuals identify and achieve personal fitness goals. The purpose of this chapter is to assist the coordinator in fulfilling this role.

### 6.1 ESTABLISH RAPPORT

The ability to establish rapport is an important part of the program because participants approach fitness appraisal with a variety of feelings about what is going to happen to them. These feelings may range all the way from excitement about the challenge involved, through mild concern about the nature of the task, to acute anxiety about their fitness levels.

These emotions are quite natural and the coordinator should be careful not to judge anyone negatively because of them. Often, the intensity of these feelings can be lessened simply by having participants identify them. If you take the time to make participants feel comfortable, their experience of the assessment will be more positive and meaningful.

Since some participants feel vulnerable when their physical condition is under scrutiny, it is important to develop trust. When you develop trust, you minimize defensiveness, which allows people to be more honest about their goals than they might otherwise be. The more friendly, relaxed and open the coordinator is, the greater the participant's trust. Reminding each participant of the confidentiality of his/her results and noting that he/she cannot "fail the tests" are helpful reminders.

To help the participants relax:

- Show them around the area.
- Explain the testing procedures and how the equipment is used.
- Ask them how they feel.
- Acknowledge their feelings by showing that you accept them.
- Answer questions.

During the testing process:

- Position yourself so that a desk or other obstacle doesn't separate the two of you.
- Face the participant.
- Maintain good eye contact.

- Smile.
- Be relaxed and informal.

## 6.2 DISCUSS TEST RESULTS

The fitness coordinator should explain test results so that the participant understands what was measured as well as the implications of the scores. To do this, the coordinator must speak to the participant's level of understanding. For some, explanations can be short and simple. For other, more inquiring individuals, the coordinator may need to consult various references in order to supply the required information.

Keep the following suggestions in mind when discussing results:

- Don't be judgmental in your comments. Avoid statements such as, "You only did 12 sit-ups," "Your results are poor," or, "Been watching too much T.V., huh?"
- Be descriptive and factual. People want to know how they did in comparison to others of the same age and gender. "You did 12 sit-ups. According to norms for your age group, your score is better than \_\_ percent of this group."
- Ask for feedback. Was your information understood?
  - "Did I answer your question about flexibility clearly?"
  - "Do you have any questions about percent body fat?"
- Use charts, tables, diagrams, etc. to help make the results more understandable. The counseling aids found in exhibit H can be a useful tool in helping the participant understand fitness concepts.

## 6.3 DISCUSS ACTIVITY PREFERENCES AND INTERESTS

Activity preferences and interests of the participant should not be overlooked. Exercise programs based on appraisal results alone are rarely successful. Unless the personal exercise programs include activities that participants are interested in, there is little chance of long-term adherence to the program. Even the most well-intentioned individual will only stay with a displeasing activity for so long.

One way to obtain this information is to use open-ended exploratory questions such as:

- "What kind of physical activities do you like to do?"
- "What activity have you always wished you could do?"
- "What activities did you enjoy when you were younger?"
- "What activities do you do or would like to do with your family or friends?"

## **6.4 ESTABLISH GOALS**

The more you discover about each participant's goals, the more helpful you can be. Once identified, these goals (rather than just level of fitness) can become the major focus of the exercise program. The test results can be interpreted and activities selected appropriate to the desired lifestyle goals.

Imagine, for example, that an officer's test results show that his body composition indices are quite poor, while his performance in the 1.5 mile run is average. In this case, emphasizing the link between aerobic activities and weight control may be more meaningful than linking aerobic activities to cardiovascular health.

The point here is that the more closely you can link test results to the participant's specific goals, the more likely the participant will hear your recommendations and act on them. To this end:

- Find out what the participant's lifestyle goals are.
- Get to know more about the participant's lifestyle by talking to him/her about work, family, and hobbies.
- Establish links between goals and exercise activities.

## **6.5 EXERCISE PROGRAM REVIEW: ADJUSTING THE PLAN TO MEET GOALS**

This step is the culmination of the assessment activity. It pulls together all the information gathered during the testing process to provide the participant with an effective plan of action. At this point, the coordinator must decide if a detailed plan is called for, or if a simple, less-structured approach is better. The more interested and more motivated the participant, the more useful a detailed, step-by-step action plan will be.

Three forms are available to help with this step. These are intended to help with behavior reinforcement and are included in exhibit H. The Action Plan Worksheet, once developed, can serve as a daily reminder of goals as well as the steps necessary to reach them. The Self-Contract can help participants focus on their goals and consider obstacles which may have to be overcome to achieve them. The Fitness Program Progress Report is used to keep track of the participant's progress in the program and to remind the participant of components that may not have been completed. The coordinator is encouraged to make copies of these forms and to use them as appropriate.

## **6.6 EXERCISE-RELATED INJURIES**

Participants should be reminded of the principles of conditioning and that the prevention of injuries is always a concern in any fitness program. Coordinators should constantly stress the importance of the warm-up and cool-down, and caution participants about trying to do too much too soon. The Officer's Manual contains a section on injury prevention and treatment (see pages 19-24) which the coordinator should read and understand. Coordinators should encourage officers to review this section of the Officer's Manual. Being aware of how certain injuries can happen will reduce their occurrence.

## **6.7 GETTING STARTED**

Now that you have read through this Coordinator's Manual, your next step is to read the Officer's Manual. The Officer's Manual contains much of the material that you will need to operate the program, including the test protocols and scoring tables.

Following your reading of the Officer's Manual, it will be very helpful to review the current manual a second time, particularly chapter 1.

If after you are done you still have questions, please call the POST Standards and Evaluation Services Bureau at (916) 227-4820.

# REFERENCES

## PERIODICALS

University of California, Berkeley Wellness Letter, Published by Health Letter Associates, P.O. Box 420148, Palm Coast, FL 32142

Journal of the National Strength and Conditioning Association

Running and Fitness News, Published by American Running and Fitness Association, 9310 Old Georgetown Rd, Bethesda, MD 20814, Phone: (301) 897-0197

## POST DOCUMENTS

POST Basic Academy Physical Conditioning Manual (1990). Available from POST upon request.

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## TEXTS

Anderson, Bob (1980). Stretching, Bolinas, CA: Shelter Publications.

Cooper, Kenneth H. (1982). The Aerobics Program For Total Well Being, Toronto: Bantam Books.

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Lombardi, V. Patterson (1989). Beginning Weight Training, Dubuque, Iowa: William C. Brown Publishers.

Perl, W. (1985). Getting Stronger, Bolinas, CA: Shelter Publications.

Sharkey, Brian J. (1984). Physiology of Fitness: Prescribing Exercise for Fitness, Weight Control, and Health, (2nd ed.), Champaign, IL: Human Kinetics Publishers.

Westcott, Wayne (1982). Strength, Fitness, Physiological Principles and Training Techniques, Boston: Allyn and Bacon Inc.

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# EXHIBIT A

## Physical Fitness Testing Equipment

The following equipment is required to administer the fitness test battery:

### General:

- ▶ room thermometer
- ▶ table and chairs
- ▶ pens, pencils and clipboards

### For heart rate and blood pressure measurements:

- ▶ chair with arm support
- ▶ stethoscope and sphygmomanometer (blood pressure cuff)
- ▶ stopwatch

### For anthropometric (body composition) measurements:

- ▶ measuring tape for height measurement
- ▶ calibrated (accurate) scale for weight measurement
- ▶ Harpenden or Lange skinfold calipers
- ▶ anthropometric tape measure (preferably metal and spring-ended)

### For the flexibility test:

- ▶ sit and reach box

### For muscular strength and endurance tests:

- ▶ stopwatch
- ▶ wall
- ▶ gym mat
- ▶ masking tape or chalk

### For cardiopulmonary fitness tests:

- ▶ stopwatch
- ▶ distance measuring device
- ▶ traffic cones

### For cognitive test:

- ▶ table, chairs, and pencils



## EXHIBIT B

### Emergency Equipment and Procedures

The chances of an injury-related incident occurring during the testing are minimal if proper pre-test screening and test administration take place. The most common incident likely to occur is a dizzy spell or fainting, particularly after the cardiovascular test (see instructions on page 9 of the Officer's Manual for proper cool-down to help prevent this from occurring). If this reaction occurs, have the participant lie down on his/her back and elevate the legs. This will help restore blood circulation to normal. Have the subject remain in this position until blood pressure returns to the pre-exercise level. If the participant does not recover within one minute, the Emergency Medical System (911) should be requested at once. Contact the participant's personal physician, if possible.

In the event of a more serious occurrence, such as a heart attack, it is imperative that the coordinator act immediately. The Emergency Medical System (911) should be requested immediately.

A thorough knowledge of emergency equipment and procedures is advised. Basic equipment and procedures are outlined below. All fitness coordinators and all persons who assist in proctoring the fitness battery should be currently certified in first aid and cardiopulmonary resuscitation (CPR).<sup>3</sup> Courses are offered by the American Heart Association and the American Red Cross.

Equipment. When an emergency occurs, there is often little time to think. In order to respond quickly, the coordinator should have emergency equipment close at hand. The following is a checklist of supplies which are helpful should an emergency situation arise.

- ▶ Phone (have change ready if its a pay phone).
- ▶ List of emergency numbers readily accessible.
- ▶ Emergency kit and supplies (bandages, gauze, tape, cloth, blanket, splints, ice, etc.).

Procedures. The coordinator should be familiar with emergency procedures so that quick and proper action can be taken when necessary.

- ▶ Stay calm. This will help to reassure the injured person.
- ▶ Be prepared. Familiarize yourself with the location of emergency equipment. Pre-plan the course of action and occasionally run practice drills.
- ▶ Check for a medical alert identification tag.
- ▶ Contact the Emergency Medical System (911) as soon as possible.
- ▶ Know CPR techniques.

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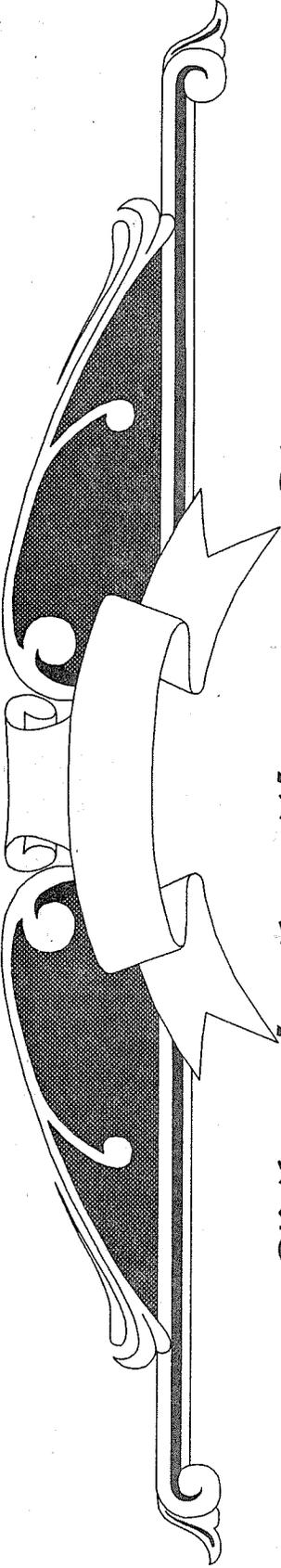
<sup>3</sup>This requirement is consistent with the Standards and Guidelines for Health and Fitness Institutions published by the American College of Sports Medicine (1992), the Industry Standards for Health and Fitness Facilities published by the Association of Quality Clubs (1993) and section 8.3.1 and 8.3.2 of POST's Guidelines for Student Safety in Certified Courses (1990).

- ▶ Administer artificial respiration or CPR if necessary.
- ▶ Find out how the injury occurred. Observe the scene of the injury, ask the injured person what happened (if the injured person is unconscious or semi-conscious, ask witnesses).
- ▶ Check vital signs: Level of consciousness, heart rate, respiratory (breathing) rate, bleeding, blood pressure, eye pupil size and response, evidence of broken bones, loss of sensation or muscle function and reaction to pain (especially in the neck or back). If you are in doubt, assume there is an injury to the neck or back and do not move the victim unless absolutely necessary.

**EXHIBIT C**

**SAMPLE CERTIFICATES OF RECOGNITION**





# Physical Fitness Award

*Presented to:*

\_\_\_\_\_

The above named individual is hereby recognized  
for outstanding achievement in the P.O.S.T.  
In-Service Physical Fitness Program.

## GOLD

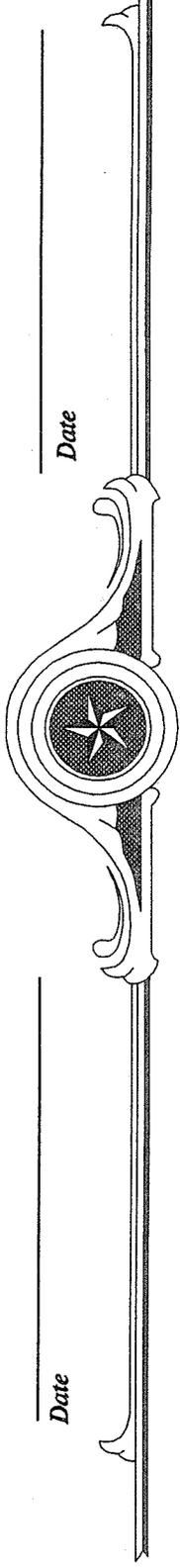
## Award

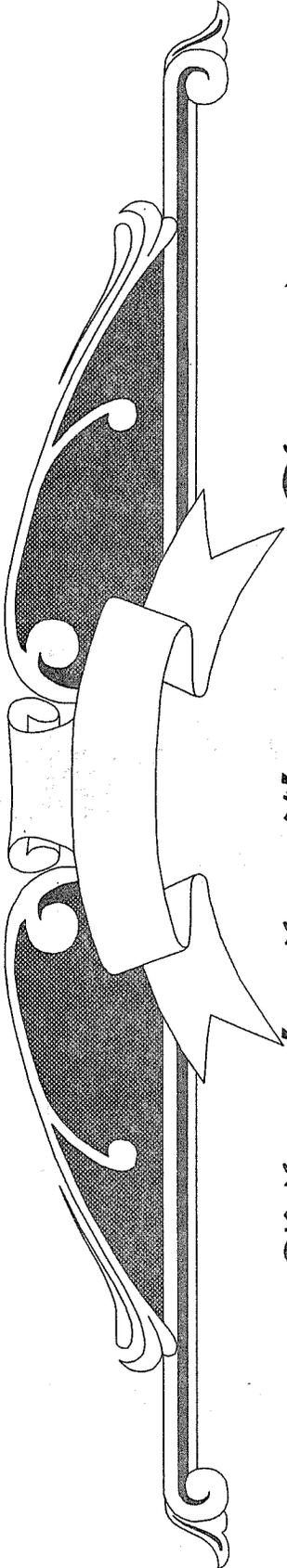
\_\_\_\_\_  
*Fitness Coordinator*

\_\_\_\_\_  
*Local Agency Administrator*

\_\_\_\_\_  
*Date*

\_\_\_\_\_  
*Date*





# Physical Fitness Award

*Presented to:*

\_\_\_\_\_

The above named individual is hereby recognized  
for outstanding achievement in the P.O.S.T.  
In-Service Physical Fitness Program.

## SILVER

### Award

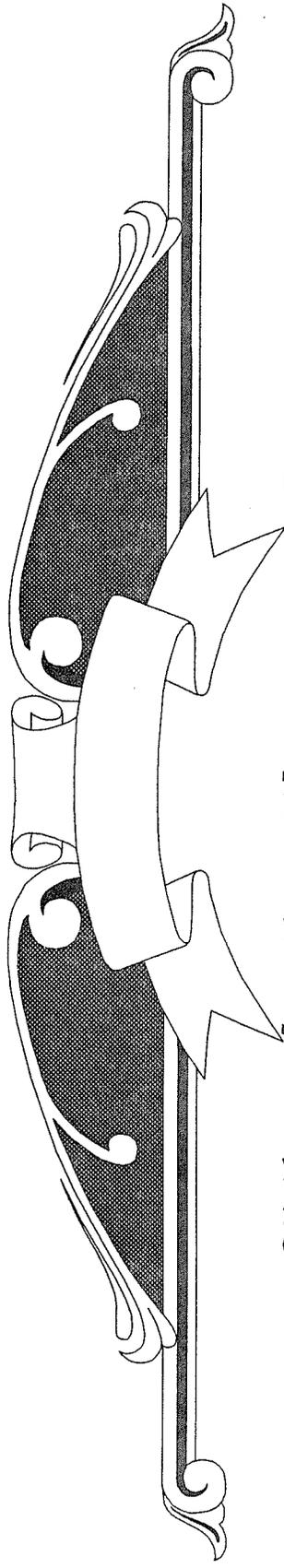
\_\_\_\_\_  
*Fitness Coordinator*

\_\_\_\_\_  
*Local Agency Administrator*

\_\_\_\_\_  
*Date*

\_\_\_\_\_  
*Date*





# Physical Fitness Award

*Presented to:*

\_\_\_\_\_

The above named individual is hereby recognized  
for outstanding achievement in the P.O.S.T.  
In-Service Physical Fitness Program.

## BRONZE

### Award

\_\_\_\_\_

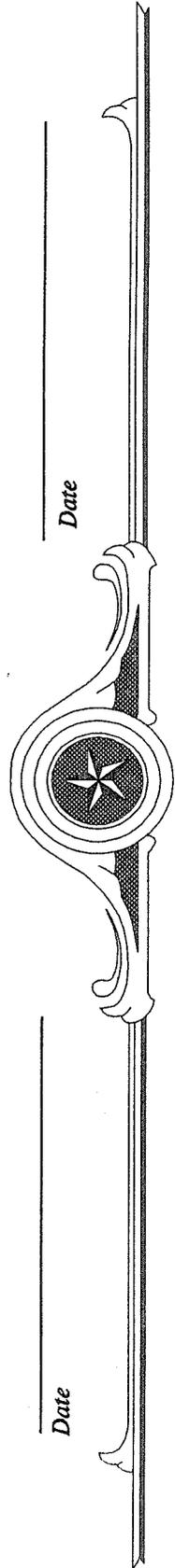
*Fitness Coordinator*

*Local Agency Administrator*

\_\_\_\_\_

*Date*

*Date*





**EXHIBIT D**

**INFORMED CONSENT**

**PHYSICIAN'S LETTER**

**MEDICAL CLEARANCE FORM**

**PERQ**

**MEDICAL INFORMATION RELEASE FORM**

**RISKO**





## 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 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.)		

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.

Dear Physician:

The officer whose name appears below is employed by the (name of department), and has expressed the desire to participate in a physical fitness program being administered by the department. The program was developed by the California Commission on Peace Officer Standards and Training (POST).

Officer's Name: \_\_\_\_\_

The program consists of an evaluation of blood cholesterol, body composition (skinfolds and waist-to-hip ratio), cardiopulmonary endurance (1.5 Mile Run or 3.0 Mile Walk), lower back and hamstring flexibility (sit and reach test) and muscular strength and endurance (maximal number of push-ups and abdominal crunches in 1 minute). These tests are not performed under medical supervision, but the participants are closely monitored by CPR-certified testing officers. The pre-screening procedure consists of administering a Physical Exercise Readiness Questionnaire and determining resting heart rate and blood pressure.

After entering the program, officers are expected to develop and implement a personal exercise plan designed to improve their fitness in three areas: flexibility, cardiovascular (aerobic) endurance and muscular strength/endurance. The personal fitness program consists of a warm-up, a conditioning period and a cool-down, is conducted at least three days a week and each day's session is at least 30 minutes in duration. Examples of flexibility exercises include stretches. Examples of aerobic conditioning include jogging, cycling, swimming, and fast walking. Examples of muscular strength/endurance conditioning include calisthenics and weight training (free weights and Universal-type weight machines).

Upon pre-screening, this officer was found to have the following readings for resting heart rate and blood pressure:

Heart Rate \_\_\_\_\_ Blood Pressure \_\_\_\_\_ / \_\_\_\_\_

The officer's completed Physical Exercise Readiness Questionnaire is attached for your review.

Because of the officer's resting heart rate, blood pressure and/or responses to the questionnaire, we have prohibited this officer from performing the fitness tests and starting the program until clearance is obtained from a physician.

Please complete the attached Medical Clearance form following your examination.

If you have any questions, please call me at (\_\_\_\_\_) \_\_\_\_\_.

Thank you for your cooperation.

Sincerely,

\_\_\_\_\_  
Physical Fitness Testing Coordinator

**MEDICAL CLEARANCE**

**TO PARTICIPATE IN THE IN-SERVICE  
PHYSICAL FITNESS PROGRAM**

\_\_\_\_\_  
Print name of individual

Having reviewed the above-named individual's Physical Exercise Readiness Questionnaire and having read the description provided of the In-Service Physical Fitness Program, and having personally examined the above-named individual, it is my professional opinion that:

Check (✓) one:

\_\_\_\_\_ It is unlikely that participation in the In-Service Physical Fitness Program (i.e., physical fitness testing and participating in a graduated exercise program) will pose a significant medical risk to the above-named individual

\_\_\_\_\_ The above-named individual's participation in the In-Service Physical Fitness Program should be restricted as follows:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_ The above-named individual should not participate in the In-Service Physical Fitness Program because:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Physician's Signature

\_\_\_\_\_  
Date

# PHYSICAL EXERCISE READINESS QUESTIONNAIRE (PERQ)

Name: _____	Agency: _____
-------------	---------------

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 <b>YES</b> to one or more questions	If you answered <b>NO</b> to all questions
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.	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.

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



# MEDICAL INFORMATION RELEASE FORM

## AUTHORIZATION FOR THE RELEASE OF MEDICAL INFORMATION TO MY AGENCY

To: Any licensed physician, other licensed practitioner, hospital, clinic or other medically-related facility who/which is in possession of medical records pertaining to:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

In order to determine my suitability to begin a physical fitness exercise program with my agency, I authorize you to copy and to transmit to the Physical Fitness Coordinator listed below the completed "Medical Clearance To Participate in the In-Service Physical Fitness Program," and any other data or records that concern my physical health as it relates specifically to engaging in a regular program of strenuous physical exercise.

Physical Fitness Coordinator's Name: \_\_\_\_\_

Agency: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Telephone: (        ) \_\_\_\_\_

This authorization shall be valid for a period of 90 days after the date of my signature or earlier if revoked by me in writing.

I hereby acknowledge that I have been informed of my right to receive a copy of this authorization upon request.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



## RISK

### 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.



**EXHIBIT E**

**PHYSICAL FITNESS TEST BATTERY SCORE SHEET**

**PERSONAL FITNESS PLAN**



# PHYSICAL FITNESS TEST BATTERY SCORE SHEET

NAME: \_\_\_\_\_

BIRTHDATE: \_\_\_\_\_

GENDER:  Male  Female

TODAY'S DATE: \_\_\_\_\_

## PRE-TEST SCREENING

INFORMED CONSENT FORM

INFORMATION RELEASE (if required)

RESTING HEART RATE: \_\_\_\_\_ BPM

PERQ COMPLETED

RESTING BLOOD PRESSURE: \_\_\_\_\_ / \_\_\_\_\_ mmHg

Referred to Physician (if required)

Cleared to Participate

## GENERAL HEALTH INDICIES

### RISKO

Completed

### TOBACCO USE:

- Current User  
 Not in last 2 months  
 Not in last 12 months

### CHOLESTEROL:

- Doesn't know own level  
 Knows own level  
 Date analyzed: \_\_\_\_\_

## BODY COMPOSITION Percent Body Fat

### MALES

Chest \_\_\_\_\_  
 Abdm \_\_\_\_\_  
 Thigh \_\_\_\_\_

### FEMALES

Tricp \_\_\_\_\_  
 Supra \_\_\_\_\_  
 Thigh \_\_\_\_\_

Sum of 3 measures = \_\_\_\_\_

% Body Fat = \_\_\_\_\_ %

## PHYSICAL FITNESS TEST BATTERY

### BODY COMPOSITION Waist-Hip Ratio

Waist: \_\_\_\_\_ Hip: \_\_\_\_\_ Ratio: \_\_\_\_\_

### CARDIOVASCULAR

1.5 Mile Run -or-  3 Mile Walk (Check only one box)

Min: \_\_\_\_\_ Sec: \_\_\_\_\_

### FLEXIBILITY Sit and Reach Test

Trial #1 \_\_\_\_\_ Trial #2 \_\_\_\_\_ Trial #3 \_\_\_\_\_

Best: \_\_\_\_\_

### MUSCULAR STRENGTH

Push-ups (Maximum in proper form)

Push-ups \_\_\_\_\_

Bent-Knee Sit-ups (Maximum in 1 minute)

Sit-ups \_\_\_\_\_

Height: \_\_\_\_\_ (ins) Weight: \_\_\_\_\_ (lbs)

## WRITTEN TEST SCORE

[( \_\_\_\_\_ / 25) X 100]

Score \_\_\_\_\_

## CERTIFICATION

The undersigned certify that the above data are accurate.

\_\_\_\_\_  
 (Coordinator's Signature)

\_\_\_\_\_  
 (Date)

\_\_\_\_\_  
 (Officer's Signature)

\_\_\_\_\_  
 (Date)

## MALES

### PERCENT BODY FAT

	20-29	30-39	40-49	50-59	60 +
GOLD	9.4	13.9	16.3	17.9	18.4
SILVER	11.8	15.9	18.1	19.8	20.3
BRONZE	14.1	17.5	19.6	21.3	22.0

## FEMALES

	20-29	30-39	40-49	50-59	60 +
GOLD	17.1	18.0	21.3	25.0	25.1
SILVER	19.0	20.0	23.5	26.6	27.5
BRONZE	20.6	21.6	24.9	28.5	29.3

### WAIST-HIP RATIO

	20-29	30-39	40-49	50-59	60 +
GOLD	.81	.83	.86	.89	.90
SILVER	.83	.84	.88	.90	.91
BRONZE	.84	.86	.90	.92	.93

*ADVISORY  
ONLY*

	20-29	30-39	40-49	50-59	60 +
GOLD	.69	.71	.72	.73	.75
SILVER	.72	.73	.74	.75	.77
BRONZE	.73	.75	.76	.77	.79

### 1.5 MILE RUN

	20-29	30-39	40-49	50-59	60 +
GOLD	10:16	10:47	11:44	12:51	13:53
SILVER	10:47	11:34	12:34	13:45	14:53
BRONZE	11:41	12:20	13:14	14:24	15:29

	20-29	30-39	40-49	50-59	60 +
GOLD	12:51	13:43	14:31	15:57	16:20
SILVER	13:53	14:24	15:26	16:27	16:58
BRONZE	14:24	15:08	15:57	16:58	17:46

### SIT AND REACH TEST

	18-25	26-35	36-45	46-55	56 +
GOLD	19	18	17	17	15
SILVER	18	17	16	15	14
BRONZE	17	16	15	14	13

	18-25	26-35	36-45	46-55	56 +
GOLD	22	21	20	19	18
SILVER	21	20	19	18	17
BRONZE	20	19	17	17	16

### PUSH-UPS

	20-29	30-39	40-49	50-59	60 +
GOLD	34	27	21	17	16
SILVER	30	24	19	14	11
BRONZE	27	21	16	11	10

	20-29	30-39	40-49	50-59	60 +
GOLD	26	24	22	17	15
SILVER	22	21	18	13	12
BRONZE	20	17	14	10	10

### BENT-KNEE SIT-UPS

	20-29	30-39	40-49	50-59	60 +
GOLD	41	34	30	25	21
SILVER	38	32	27	23	18
BRONZE	36	30	25	21	15

	20-29	30-39	40-49	50-59	60 +
GOLD	34	27	23	17	15
SILVER	31	25	21	14	13
BRONZE	29	23	18	11	10

# 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 \_\_\_\_\_

# EXHIBIT F

## INSTRUCTIONS FOR ADMINISTERING AND SCORING THE WRITTEN EXAMINATION

### Test Security

Fitness coordinators must maintain the security of all test booklets and the scoring key at all times. The only time that program participants or potential participants should see the exam is when they are taking it. Participants should not be shown the answer key under any circumstances.

### Test Booklets

POST will provide one (1) master copy of the 25-item multiple-choice Fitness Knowledge Examination. Local agency fitness coordinators are responsible for reproducing the booklet for use in their agencies.

### Answer Sheets

There are four (4) options on each test question in the Fitness Knowledge Exam: A, B, C, and D. Thus, local coordinators may use any kind of multiple-choice answer sheet that provides for 4 or more response options.

### Time Frame

A time limit of 30 minutes is allowed for administering the exam.

### Test Administration

The exam should be administered in a well-lit comfortable room. Participants may not use notes, or any type of reference material. This is not an open-book test.

Participants should be seated at a table or desk with plenty of elbow room. There is no talking during the test.

### Scoring

The Fitness Knowledge Exam is scored by hand. A scoring key is provided along with the master test booklet. The number of correct answers is the score on the test.

### Passing Score

The passing score on the exam is 80 percent correct. This corresponds to 20 correct answers.



## **EXHIBIT G**

### **AMERICAN COLLEGE OF SPORTS MEDICINE POSITION STAND**

#### **THE RECOMMENDED QUANTITY AND QUALITY OF EXERCISE FOR DEVELOPING AND MAINTAINING CARDIORESPIRATORY AND MUSCULAR FITNESS IN HEALTHY ADULTS**





**AMERICAN COLLEGE  
of SPORTS MEDICINE**

POSITION STAND

# The Recommended Quantity and Quality of Exercise for Developing and Maintaining Cardiorespiratory and Muscular Fitness in Healthy Adults

*This Position Stand replaces the 1978 ACSM position paper, "The Recommended Quantity and Quality of Exercise for Developing and Maintaining Fitness in Healthy Adults."*

Increasing numbers of persons are becoming involved in endurance training and other forms of physical activity, and, thus, the need for guidelines for exercise prescription is apparent. Based on the existing evidence concerning exercise prescription for healthy adults and the need for guidelines, the American College of Sports Medicine (ACSM) makes the following recommendations for the quantity and quality of training for developing and maintaining cardiorespiratory fitness, body composition, and muscular strength and endurance in the healthy adult:

1. Frequency of training: 3–5 d·wk<sup>-1</sup>.
2. Intensity of training: 60–90% of maximum heart rate (HR<sub>max</sub>), or 50–85% of maximum oxygen uptake (VO<sub>2max</sub>) or HR<sub>max</sub> reserve.<sup>1</sup>
3. Duration of training: 20–60 min of continuous aerobic activity. Duration is dependent on the intensity of the activity; thus, lower intensity activity should be conducted over a longer period of time. Because of the importance of "total fitness" and the fact that it is more readily attained in longer duration programs, and because of the potential hazards and compliance problems associated with high intensity activity, lower to moderate intensity activity of longer duration is recommended for the nonathletic adult.
4. Mode of activity: any activity that uses large muscle groups, can be maintained continuously, and is rhythmic and aerobic in nature, e.g., walking-hiking, running-jogging, cycling-bicycling, cross-country skiing, dancing, rope skipping, rowing, stair climbing, swimming, skating, and various endurance game activities.
5. Resistance training: Strength training of a moderate intensity, sufficient to develop and maintain fat-free

<sup>1</sup> Maximum heart rate reserve is calculated from the difference between resting and maximum heart rate. To estimate training intensity, a percentage of this value is added to the resting heart rate and is expressed as a percentage of HR<sub>max</sub> reserve (85).

weight (FFW), should be an integral part of an adult fitness program. One set of 8–12 repetitions of eight to ten exercises that condition the major muscle groups at least 2 d·wk<sup>-1</sup> is the recommended minimum.

## RATIONALE AND RESEARCH BACKGROUND

### Introduction

The questions "How much exercise is enough," and "What type of exercise is best for developing and maintaining fitness?" are frequently asked. It is recognized that the term "physical fitness" is composed of a variety of characteristics included in the broad categories of cardiovascular-respiratory fitness, body composition, muscular strength and endurance, and flexibility. In this context fitness is defined as the ability to perform moderate to vigorous levels of physical activity without undue fatigue and the capability of maintaining such ability throughout life (167). It is also recognized that the adaptive response to training is complex and includes peripheral, central, structural, and functional factors (5,172). Although many such variables and their adaptive response to training have been documented, the lack of sufficient in-depth and comparative data relative to frequency, intensity, and duration of training makes them inadequate to use as comparative models. Thus, in respect to the above questions, fitness is limited mainly to changes in VO<sub>2max</sub>, muscular strength and endurance, and body composition, which includes total body mass, fat weight (FW), and FFW. Further, the rationale and research background used for this position stand will be divided into programs for cardiorespiratory fitness and weight control and programs for muscular strength and endurance.

**Fitness versus health benefits of exercise.** Since the original position statement was published in 1978, an important distinction has been made between physical activity as it relates to health versus fitness. It has been pointed out that the quantity and quality of ex-

ercise needed to attain health-related benefits may differ from what is recommended for fitness benefits. It is now clear that lower levels of physical activity than recommended by this position statement may reduce the risk for certain chronic degenerative diseases and yet may not be of sufficient quantity or quality to improve  $\dot{V}O_{2\max}$  (71,72,98,167). ACSM recognizes the potential health benefits of regular exercise performed more frequently and for a longer duration, but at lower intensities than prescribed in this position statement (13A,71,100,120,160). ACSM will address the issue concerning the proper amount of physical activity necessary to derive health benefits in another statement.

**Need for standardization of procedures and reporting results.** Despite an abundance of information available concerning the training of the human organism, the lack of standardization of testing protocols and procedures, of methodology in relation to training procedures and experimental design, and of a preciseness in the documentation and reporting of the quantity and quality of training prescribed make interpretation difficult (123,133,139,164,167). Interpretation and comparison of results are also dependent on the initial level of fitness (42,43,58,114,148,151,156), length of time of the training experiment (17,45,125,128,139,145,150), and specificity of the testing and training (5,43,130,139,145A,172). For example, data from training studies using subjects with varied levels of  $\dot{V}O_{2\max}$ , total body mass, and FW have found changes to occur in relation to their initial values (14,33,109,112,113,148,151); i.e., the lower the initial  $\dot{V}O_{2\max}$  the larger the percentage of improvement found, and the higher the FW the greater the reduction. Also, data evaluating trainability with age, comparison of the different magnitudes and quantities of effort, and comparison of the trainability of men and women may have been influenced by the initial fitness levels.

In view of the fact that improvement in the fitness variables discussed in this position statement continues over many months of training (27,86,139,145,150), it is reasonable to believe that short-term studies conducted over a few weeks have certain limitations. Middle-aged sedentary and older participants may take several weeks to adapt to the initial rigors of training, and thus need a longer adaptation period to get the full benefit from a program. For example, Seals et al. (150) exercise trained 60–69-yr-olds for 12 months. Their subjects showed a 12% improvement in  $\dot{V}O_{2\max}$  after 6 months of moderate intensity walking training. A further 18% increase in  $\dot{V}O_{2\max}$  occurred during the next 6 months of training when jogging was introduced. How long a training experiment should be conducted is difficult to determine, but 15–20 wk may be a good minimum standard. Although it is difficult to control exercise training experiments for more than 1 yr, there is a need to study this effect. As stated earlier, lower

doses of exercise may improve  $\dot{V}O_{2\max}$  and control or maintain body composition, but at a slower rate.

Although most of the information concerning training described in this position statement has been conducted on men, the available evidence indicates that women tend to adapt to endurance training in the same manner as men (19,38,46,47,49,62,65,68,90,92,122,166).

### Exercise Prescription for Cardiorespiratory Fitness and Weight Control

Exercise prescription is based upon the frequency, intensity, and duration of training, the mode of activity (aerobic in nature, e.g., listed under No. 4 above), and the initial level of fitness. In evaluating these factors, the following observations have been derived from studies conducted for up to 6–12 months with endurance training programs.

Improvement in  $\dot{V}O_{2\max}$  is directly related to frequency (3,6,50,75–77,125,126,152,154,164), intensity (3,6,26,29,58,61,75–77,80,85,93,118,152,164), and duration (3,29,60,61,70,75–77,101,109,118,152,162,164,168) of training. Depending upon the quantity and quality of training, improvement in  $\dot{V}O_{2\max}$  ranges from 5 to 30% (8,29,30,48,59,61,65,67,69,75–77,82,84,96,99,101,102,111,115,119,123,127,139,141,143,149,150,152,153,158,164,168,173). These studies show that a minimum increase in  $\dot{V}O_{2\max}$  of 15% is generally attained in programs that meet the above stated guidelines. Although changes in  $\dot{V}O_{2\max}$  greater than 30% have been shown, they are usually associated with large total body mass and FW loss, in cardiac patients, or in persons with a very low initial level of fitness. Also, as a result of leg fatigue or a lack of motivation, persons with low initial fitness may have spuriously low initial  $\dot{V}O_{2\max}$  values. Klissouras (94A) and Bouchard (16A) have shown that human variation in the trainability of  $\dot{V}O_{2\max}$  is important and related to current phenotype level. That is, there is a genetically determined pre-training status of the trait and capacity to adapt to physical training. Thus, physiological results should be interpreted with respect to both genetic variation and the quality and quantity of training performed.

**Intensity-duration.** Intensity and duration of training are interrelated, with total amount of work accomplished being an important factor in improvement in fitness (12,20,27,48,90,92,123,127,128,136,149,151,164). Although more comprehensive inquiry is necessary, present evidence suggests that, when exercise is performed above the minimum intensity threshold, the total amount of work accomplished is an important factor in fitness development (19,27,126,127,149,151) and maintenance (134). That is, improvement will be similar for activities performed at a lower intensity-

longer duration compared to higher intensity-shorter duration if the total energy costs of the activities are equal. Higher intensity exercise is associated with greater cardiovascular risk (156A), orthopedic injury (124,139) and lower compliance to training than lower intensity exercise (36,105,124,146). Therefore, programs emphasizing low to moderate intensity training with longer duration are recommended for most adults.

The minimal training intensity threshold for improvement in  $\dot{V}O_{2\max}$  is approximately 60% of the  $HR_{\max}$  (50% of  $\dot{V}O_{2\max}$  or  $HR_{\max}$  reserve) (80,85). The 50% of  $HR_{\max}$  reserve represents a heart rate of approximately 130–135  $\text{beats} \cdot \text{min}^{-1}$  for young persons. As a result of the age-related change in maximum heart rate, the absolute heart rate to achieve this threshold is inversely related to age and can be as low as 105–115  $\text{beats} \cdot \text{min}^{-1}$  for older persons (35,65,150). Patients who are taking beta-adrenergic blocking drugs may have significantly lower heart rate values (171). Initial level of fitness is another important consideration in prescribing exercise (26,90,104,148,151). The person with a low fitness level can achieve a significant training effect with a sustained training heart rate as low as 40–50% of  $HR_{\max}$  reserve, while persons with higher fitness levels require a higher training stimulus (35,58,152,164).

**Classification of exercise intensity.** The classification of exercise intensity and its standardization for exercise prescription based on a 20–60 min training session has been confusing, misinterpreted, and often taken out of context. The most quoted exercise classification system is based on the energy expenditure ( $\text{kcal} \cdot \text{min}^{-1} \cdot \text{kg}^{-1}$ ) of industrial tasks (40,89). The original data for this classification system were published by Christensen (24) in 1953 and were based on the energy expenditure of working in the steel mill for an 8-h day. The classification of industrial and leisure-time tasks by using absolute values of energy expenditure have been valuable for use in the occupational and nutritional setting. Although this classification system has broad application in medicine and, in particular, making recommendations for weight control and job placement, it has little or no meaning for preventive and rehabilitation exercise training programs. To extrapolate absolute values of energy expenditure for completing an industrial task based on an 8-h work day to 20–60 min regimens of exercise training does not make sense. For example, walking and jogging/running can be accomplished at a wide range of speeds; thus, the relative intensity becomes important under these conditions. Because the endurance training regimens recommended by ACSM for nonathletic adults are geared for 60 min or less of physical activity, the system of classification of exercise training intensity shown in Table 1 is recommended (139). The use of a realistic time period for training and an individual's relative exercise intensity makes this system amenable to young,

TABLE 1. Classification of intensity of exercise based on 20–60 min of endurance training.

Relative Intensity (%)		Rating of Perceived Exertion	Classification of Intensity
$HR_{\max}^*$	$\dot{V}O_{2\max}^*$ or $HR_{\max}$ reserve		
<35%	<30%	<10	Very light
35–59%	30–49%	10–11	Light
60–79%	50–74%	12–13	Moderate (somewhat hard)
80–89%	75–84%	14–16	Heavy
$\geq 90\%$	$\geq 85\%$	>16	Very heavy

Table from Pollock, M. L. and J. H. Wilmore. *Exercise in Health and Disease: Evaluation and Prescription for Prevention and Rehabilitation*, 2nd Ed. Philadelphia: W.B. Saunders, 1990. Published with permission.

\*  $HR_{\max}$  = maximum heart rate;  $\dot{V}O_{2\max}$  = maximum oxygen uptake.

middle-aged, and elderly participants, as well as patients with a limited exercise capacity (3,137,139).

Table 1 also describes the relationship between relative intensity based on percent  $HR_{\max}$ , percentage of  $HR_{\max}$  reserve or percentage of  $\dot{V}O_{2\max}$ , and the rating of perceived exertion (RPE) (15,16,137). The use of heart rate as an estimate of intensity of training is the common standard (3,139).

The use of RPE has become a valid tool in the monitoring of intensity in exercise training programs (11,37,137,139). It is generally considered an adjunct to heart rate in monitoring relative exercise intensity, but once the relationship between heart rate and RPE is known, RPE can be used in place of heart rate (23,139). This would not be the case in certain patient populations where a more precise knowledge of heart rate may be critical to the safety of the program.

**Frequency.** The amount of improvement in  $\dot{V}O_{2\max}$  tends to plateau when frequency of training is increased above 3  $\text{d} \cdot \text{wk}^{-1}$  (50,123,139). The value of the added improvement found with training more than 5  $\text{d} \cdot \text{wk}^{-1}$  is small to not apparent in regard to improvement in  $\dot{V}O_{2\max}$  (75–77,106,123). Training of less than 2  $\text{d} \cdot \text{wk}^{-1}$  does not generally show a meaningful change in  $\dot{V}O_{2\max}$  (29,50,118,123,152,164).

**Mode.** If frequency, intensity, and duration of training are similar (total kcal expenditure), the training adaptations appear to be independent of the mode of aerobic activity (101A,118,130). Therefore, a variety of endurance activities, e.g., those listed above, may be used to derive the same training effect.

Endurance activities that require running and jumping are considered high impact types of activity and generally cause significantly more debilitating injuries to beginning as well as long-term exercisers than do low impact and non-weight bearing type activities (13,93,117,124,127,135,140,142). This is particularly evident in the elderly (139). Beginning joggers have increased foot, leg, and knee injuries when training is performed more than 3  $\text{d} \cdot \text{wk}^{-1}$  and longer than 30 min duration per exercise session (135). High intensity interval training (run-walk) compared to continuous jogging training

was also associated with a higher incidence of injury (124,136). Thus, caution should be taken when recommending the type of activity and exercise prescription for the beginning exerciser. Orthopedic injuries as related to overuse increase linearly in runners/joggers when performing these activities (13,140). Thus, there is a need for more inquiry into the effect that different types of activities and the quantity and quality of training has on injuries over short-term and long-term participation.

An activity such as weight training should not be considered as a means of training for developing  $\dot{V}O_{2max}$ , but it has significant value for increasing muscular strength and endurance and FFW (32,54,107, 110,165). Studies evaluating circuit weight training (weight training conducted almost continuously with moderate weights, using 10–15 repetitions per exercise session with 15–30 s rest between bouts of activity) show an average improvement in  $\dot{V}O_{2max}$  of 6% (1,51–54,83,94,108,170). Thus, circuit weight training is not recommended as the only activity used in exercise programs for developing  $\dot{V}O_{2max}$ .

**Age.** Age in itself does not appear to be a deterrent to endurance training. Although some earlier studies showed a lower training effect with middle-aged or elderly participants (9,34,79,157,168), more recent studies show the relative change in  $\dot{V}O_{2max}$  to be similar to younger age groups (7,8,65,132,150,161,163). Although more investigation is necessary concerning the rate of improvement in  $\dot{V}O_{2max}$  with training at various ages, at present it appears that elderly participants need longer periods of time to adapt (34,132,150). Earlier studies showing moderate to no improvement in  $\dot{V}O_{2max}$  were conducted over a short time span (9), or exercise was conducted at a moderate to low intensity (34), thus making the interpretation of the results difficult.

Although  $\dot{V}O_{2max}$  decreases with age and total body mass and FW increase with age, evidence suggests that this trend can be altered with endurance training (22,27,86–88,139). A 9% reduction in  $\dot{V}O_{2max}$  per decade for sedentary adults after age 25 has been shown (31,73), but for active individuals the reduction may be less than 5% per decade (21,31,39,73). Ten or more yr follow-up studies where participants continued training at a similar level showed maintenance of cardiorespiratory fitness (4,87,88,138). A cross-sectional study of older competitive runners showed progressively lower values in  $\dot{V}O_{2max}$  from the fourth to seventh decades of life, but also showed less training in the older groups (129). More recent 10-yr follow-up data on these same athletes (50–82 yr of age) showed  $\dot{V}O_{2max}$  to be unchanged when training quantity and quality remained unchanged (138). Thus, lifestyle plays a significant role in the maintenance of fitness. More inquiry into the relationship of long-term training (quantity and qual-

ity), for both competitors and noncompetitors, and physiological function with increasing age is necessary before more definitive statements can be made.

**Maintenance of training effect.** In order to maintain the training effect, exercise must be continued on a regular basis (18,25,28,47,97,111,144,147). A significant reduction in cardiorespiratory fitness occurs after 2 wk of detraining (25,144), with participants returning to near pretraining levels of fitness after 10 wk (47) to 8 months of detraining (97). A loss of 50% of their initial improvement in  $\dot{V}O_{2max}$  has been shown after 4–12 wk of detraining (47,91,144). Those individuals who have undergone years of continuous training maintain some benefits for longer periods of detraining than subjects from short-term training studies (25). While stopping training shows dramatic reductions in  $\dot{V}O_{2max}$ , reduced training shows modest to no reductions for periods of 5–15 wk (18,75–77,144). Hickson et al., in a series of experiments where frequency (75), duration (76), or intensity (77) of training were manipulated, found that, if intensity of training remained unchanged,  $\dot{V}O_{2max}$  was maintained for up to 15 wk when frequency and duration of training were reduced by as much as  $\frac{2}{3}$ . When frequency and duration of training remained constant and intensity of training was reduced by  $\frac{1}{3}$  or  $\frac{2}{3}$ ,  $\dot{V}O_{2max}$  was significantly reduced. Similar findings were found in regards to reduced strength training exercise. When strength training exercise was reduced from 3 or 2 d·wk<sup>-1</sup> to at least 1 d·wk<sup>-1</sup>, strength was maintained for 12 wk of reduced training (62). Thus, it appears that missing an exercise session periodically or reducing training for up to 15 wk will not adversely affect  $\dot{V}O_{2max}$  or muscular strength and endurance as long as training intensity is maintained.

Even though many new studies have given added insight into the proper amount of exercise, investigation is necessary to evaluate the rate of increase and decrease of fitness when varying training loads and reduction in training in relation to level of fitness, age, and length of time in training. Also, more information is needed to better identify the minimal level of exercise necessary to maintain fitness.

**Weight control and body composition.** Although there is variability in human response to body composition change with exercise, total body mass and FW are generally reduced with endurance training programs (133,139,171A), while FFW remains constant (123,133,139,169) or increases slightly (116,174). For example, Wilmore (171A) reported the results of 32 studies that met the criteria for developing cardiorespiratory fitness that are outlined in this position stand and found an average loss in total body mass of 1.5 kg and percent fat of 2.2%. Weight loss programs using dietary manipulation that result in a more dramatic decrease in total body mass show reductions in both FW and FFW (2,78,174). When these programs are

conducted in conjunction with exercise training. FFW loss is more modest than in programs using diet alone (78,121). Programs that are conducted at least 3 d·wk<sup>-1</sup> (123,125,126,128,169), of at least 20 min duration (109,123,169), and of sufficient intensity to expend approximately 300 kcal per exercise session (75 kg person)<sup>2</sup> are suggested as a threshold level for total body mass and FFW loss (27,64,77,123,133,139). An expenditure of 200 kcal per session has also been shown to be useful in weight reduction if the exercise frequency is at least 4 d·wk<sup>-1</sup> (155). If the primary purpose of the training program is for weight loss, then regimens of greater frequency and duration of training and low to moderate intensity are recommended (2,139). Programs with less participation generally show little or no change in body composition (44,57,93,123,133,159, 162,169). Significant increases in  $\dot{V}O_{2\max}$  have been shown with 10–15 min of high intensity training (6,79,109,118,123,152,153); thus, if total body mass and FFW reduction are not considerations, then shorter duration, higher intensity programs may be recommended for healthy individuals at low risk for cardiovascular disease and orthopedic injury.

### Exercise Prescription for Muscular Strength and Endurance

The addition of resistance/strength training to the position statement results from the need for a well-rounded program that exercises all the major muscle groups of the body. Thus, the inclusion of resistance training in adult fitness programs should be effective in the development and maintenance of FFW. The effect of exercise training is specific to the area of the body being trained (5,43,145A,172). For example, training the legs will have little or no effect on the arms, shoulders, and trunk muscles. A 10-yr follow-up of master runners who continued their training regimen, but did no upper body exercise, showed maintenance of  $\dot{V}O_{2\max}$  and a 2-kg reduction in FFW (138). Their leg circumference remained unchanged, but arm circumference was significantly lower. These data indicate a loss of muscle mass in the untrained areas. Three of the athletes who practiced weight training exercise for the upper body and trunk muscles maintained their FFW. A comprehensive review by Sale (145A) carefully documents available information on specificity of training.

Specificity of training was further addressed by Graves et al. (63). Using a bilateral knee extension exercise, they trained four groups: group A, first ½ of the range of motion; group B, second ½ of the range of motion; group AB, full range of motion; and a control group that did not train. The results clearly showed that

the training result was specific to the range of motion trained, with group AB getting the best full range effect. Thus, resistance training should be performed through a full range of motion for maximum benefit (63,95).

Muscular strength and endurance are developed by the overload principle, i.e., by increasing more than normal the resistance to movement or frequency and duration of activity (32,41,43,74,145). Muscular strength is best developed by using heavy weights (that require maximum or nearly maximum tension development) with few repetitions, and muscular endurance is best developed by using lighter weights with a greater number of repetitions (10,41,43,145). To some extent, both muscular strength and endurance are developed under each condition, but each system favors a more specific type of development (43,145). Thus, to elicit improvement in both muscular strength and endurance, most experts recommend 8–12 repetitions per bout of exercise.

Any magnitude of overload will result in strength development, but higher intensity effort at or near maximal effort will give a significantly greater effect (43,74,101B,103,145,172). The intensity of resistance training can be manipulated by varying the weight load, repetitions, rest interval between exercises, and number of sets completed (43). Caution is advised for training that emphasizes lengthening (eccentric) contractions, compared to shortening (concentric) or isometric contractions, as the potential for skeletal muscle soreness and injury is accentuated (3A,84A).

Muscular strength and endurance can be developed by means of static (isometric) or dynamic (isotonic or isokinetic) exercises. Although each type of training has its favorable and weak points, for healthy adults, dynamic resistance exercises are recommended. Resistance training for the average participant should be rhythmical, performed at a moderate to slow speed, move through a full range of motion, and not impede normal forced breathing. Heavy resistance exercise can cause a dramatic acute increase in both systolic and diastolic blood pressure (100A,101C).

The expected improvement in strength from resistance training is difficult to assess because increases in strength are affected by the participants' initial level of strength and their potential for improvement (43,66,74,114,172). For example, Mueller and Rohmert (114) found increases in strength ranging from 2 to 9% per week depending on initial strength levels. Although the literature reflects a wide range of improvement in strength with resistance training programs, the average improvement for sedentary young and middle-aged men and women for up to 6 months of training is 25–30%. Fleck and Kraemer (43), in a review of 13 studies representing various forms of isotonic training, showed an average improvement in bench press strength of 23.3% when subjects were tested on the

<sup>2</sup> Haskell and Haskell et al. (71,72) have suggested the use of 4 kcal·kg<sup>-1</sup> of body weight of energy expenditure per day for a minimum standard for use in exercise programs.

equipment with which they were trained and 16.5% when tested on special isotonic or isokinetic ergometers (six studies). Fleck and Kraemer (43) also reported an average increase in leg strength of 26.6% when subjects were tested with the equipment that they trained on (six studies) and 21.2% when tested with special isotonic or isokinetic ergometers (five studies). Results of improvement in strength resulting from isometric training have been of the same magnitude as found with isotonic training (17,43,62,63).

In light of the information reported above, the following guidelines for resistance training are recommended for the average healthy adult. A minimum of 8–10 exercises involving the major muscle groups should be performed a minimum of two times per week. A minimum of one set of 8–12 repetitions to near fatigue should be completed. These minimal standards for resistance training are based on two factors. First, the time it takes to complete a comprehensive, well-rounded exercise program is important. Programs lasting more than 60 min per session are associated with higher dropout rates (124). Second, although greater frequencies of training (17,43,56) and additional sets or combinations of sets and repetitions elicit larger strength gains (10,32,43,74,145,172), the magnitude of difference is usually small. For example, Braith et al. (17) compared training 2 d·wk<sup>-1</sup> with 3 d·wk<sup>-1</sup> for 18 wk. The subjects performed one set of 7–10 repetitions to fatigue. The 2 d·wk<sup>-1</sup> group showed a 21% increase in strength compared to 28% in the 3 d·wk<sup>-1</sup> group. In other words, 75% of what could be attained in a 3 d·wk<sup>-1</sup> program was attained in 2 d·wk<sup>-1</sup>. Also, the 21% improvement in strength found by the 2 d·wk<sup>-1</sup> regimen is 70–80% of the improvement reported by other programs using additional frequencies of training and combinations of sets and repetitions (43). Graves et al. (62,63), Gettman et al. (55), Hurley et al. (83) and Braith et al. (17) found that programs using one set to fatigue showed a greater than 25% increase in strength. Although resistance training equipment may provide a

better graduated and quantitative stimulus for overload than traditional calisthenic exercises, calisthenics and other resistance types of exercise can still be effective in improving and maintaining strength.

## SUMMARY

The combination of frequency, intensity, and duration of chronic exercise has been found to be effective for producing a training effect. The interaction of these factors provide the overload stimulus. In general, the lower the stimulus the lower the training effect, and the greater the stimulus the greater the effect. As a result of specificity of training and the need for maintaining muscular strength and endurance, and flexibility of the major muscle groups, a well-rounded training program including resistance training and flexibility exercises is recommended. Although age in itself is not a limiting factor to exercise training, a more gradual approach in applying the prescription at older ages seems prudent. It has also been shown that endurance training of fewer than 2 d·wk<sup>-1</sup>, at less than 50% of maximum oxygen uptake and for less than 10 min·d<sup>-1</sup>, is inadequate for developing and maintaining fitness for healthy adults.

In the interpretation of this position statement, it must be recognized that the recommendations should be used in the context of participants' needs, goals, and initial abilities. In this regard, a sliding scale as to the amount of time allotted and intensity of effort should be carefully gauged for both the cardiorespiratory and muscular strength and endurance components of the program. An appropriate warm-up and cool-down, which would include flexibility exercises, is also recommended. The important factor is to design a program for the individual to provide the proper amount of physical activity to attain maximal benefit at the lowest risk. Emphasis should be placed on factors that result in permanent lifestyle change and encourage a lifetime of physical activity.

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# **EXHIBIT H**

## **COUNSELING AIDS:**

**ACTION PLAN WORKSHEET**

**SELF-CONTRACT**

**FITNESS PROGRAM PROGRESS REPORT**



# Action Plan Worksheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Goals and Action Steps:

## Time Frame:

Goal #1 \_\_\_\_\_

\_\_\_\_\_

### Action Steps

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

Goal #2 \_\_\_\_\_

\_\_\_\_\_

### Action Steps

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

## Prescription for Physical Activity:

(Type, Frequency, Intensity, etc.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Success Indicators:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

Date for next fitness test: \_\_\_\_\_

# SELF-CONTRACT

1. My fitness goal is:

---

---

2. What I would need to change to achieve it is:

---

---

3. What I am willing to do to make it happen is:

---

---

4. Others will know about the change I am making when:

---

---

5. I might sabotage my plan by:

---

---

6. Therefore, my contract to myself is:

---

---

7. Check-up dates: \_\_\_\_\_  
\_\_\_\_\_

Signed:

---

(Participant)

---

(Fitness Coordinator)

# FITNESS PROGRAM PROGRESS REPORT

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

	<u>COMPLETED</u>	<u>NOT COMPLETED</u>
Informed Consent Form		
Resting Heart Rate		
Blood Pressure		
PERQ		
Cholesterol Test		
1.5 Mile Run/3 Mile Walk		
Body Fat Measurement		
Flexibility		
Push-ups		
Sit-ups		
Written Test Score		
Fitness Plan		
RISKO		

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

