



THE BASIC CURRICULUM

Municipal Police Training Committee

Health and Wellness Fitness Preparation Guide

3/2016

Academy Physical Fitness and Training Guidelines

Every student officer in an MPTC operated or sponsored academy is expected to participate fully in all physical fitness training sessions for the duration of the academy and is subject to the conditions of the Modified Health and Wellness standards for non-participation. Modified Health and Wellness is defined as anything less than full participation. Every student officer must fully participate in 70% of the sessions assigned to physical fitness. The following guidelines are intended to help student officers achieve this standard and maximize the benefit of their training programs.

1. Each student officer applying for a position in an MPTC operated or sponsored police academy must read the Physical Fitness Preparation Guide as such by signature on the Application for Enrollment form. The purpose of the Preparation Guide is to help student officers understand the rigorous training regimen of the academy and to arrive on day one in shape to meet the demands.
2. Each student officer is expected to fully participate in all training sessions and is subject to dismissal from the academy for non-participation in more than 30% of those sessions. The number of physical fitness training sessions may vary from academy to academy; the 30% rule is based on the total number of sessions assigned to physical fitness for the particular academy. The first assessment is not considered a training day and therefore not included in the 30% rule.
3. Physical training will include aerobic, anaerobic, and endurance events. **Initial endurance runs will be 1.5 miles in length and will increase incrementally to a maximum of 5 miles. The minimum pace at the start of the academy for endurance runs will be 11 minutes/mile, progressively becoming more challenging in pace (decrease in allotted time to complete the run) and mileage (increasing in mileage) throughout the academy.** Academy Directors may schedule “motivational runs” longer than 5 miles *as long as they are held within the last week of the academy*, are optional, and student officers are provided alternative exercise choices or are allowed to stop at 5 miles.
4. A student officer who cannot fully participate in a workout session shall be placed into the Modified Health and Wellness program for that day, which will be recorded as a non-participation day. Non-participation is defined by the following conditions:
 - a. The student officer is assigned to alternate exercise due to illness or injury.
 - b. The student officer is absent from the academy for any reason.
 - c. The student officer cannot maintain the minimum pace for the entire distance of an endurance run.
 - d. The student officer displays less than full effort in exercise routines that require repetitions or skills that are not quantifiable, such as jumping rope.
5. Non-participation days cannot be made up.
6. A student officer who disagrees with the designation of Modified Health and Wellness for a particular day may appeal to the Academy Director in writing within 24 hours as outlined on the MPTC website. The Academy Director will make the final decision on any appeal.
7. The Academy Director must notify the Statewide Coordinator for Health and Wellness as well as the respective police department when a student officer reaches the 25% non-participation, 50% non-participation, and 75% non-participation milestones. Reasonable efforts should be made to assist the student officer to achieve the standard.

Academy Fitness Preparation Guidelines

The MPTC has had cardiovascular and strength training duration guidelines in effect for several years. However, with the adoption of the Modified Health and Wellness Plan, which allows for dismissal of student officers who fail to fully participate in fitness training at least 70% of the allocated number of sessions, it is more important than ever for student officers to arrive at the Academy prepared to meet the requirements. In addition to a concern for the prevention of injuries, the MPTC is committed to optimizing the opportunity for all student officers to fully benefit from and to be successful in completing the Health and Wellness program. In order to meet these goals, student officers must know what to expect ahead of time and must prepare well in advance of the first day of the academy. The most significant factors in this preparation are: weight control, aerobic capacity, muscular strength and endurance, and flexibility.

Student officers entering the **academy are expected to be able to run a distance of 1.5 miles at a minimum pace of 11 minutes/mile. The minimum time allotted for completion of the 1.5 mile run will progressively decrease through each training phase for the duration of the academy. Distances run will increase incrementally to a maximum of 5 miles, with concurrent progression of pace.** Student officers who cannot complete a run in the time allotted will be placed on Modified Health and Wellness for the day. It is important to remember that this standard is a minimum standard and that with early preparation student officers can and should be prepared to exceed the minimum.

In addition to endurance runs, student officers should also expect other cardiovascular, callisthenic, and resistance training exercise routines. These will include push-ups, sit-up, abdominal crunches, jumping rope, and sprint work. **The minimum requirement for pushups in one minute at the start of the academy is 15 for males and 6 for females, progressing with each training phase throughout the duration of the academy. The minimum requirement for sit-ups in one minute at the start of the academy is 22 for males and 18 for females, progressing with each training phase throughout the duration of the academy.** Early preparation will greatly increase the likelihood of a student officer's success in these high-intensity activities. Student officers are expected to fully participate in these workout routines and may be assigned to Modified Health and Wellness for failure to display full effort. It is recommended that each candidate for a police academy prepare to run 3 miles in approximately 30 minutes prior to the start of the academy by using the guidelines in this booklet. Entering the academy in good condition will decrease the likelihood of sustaining an injury or being assigned to Modified Health and Wellness. Conditioning occurs when the body adapts to stress or load. This principle is true for aerobic, anaerobic, and flexibility training. Give yourself time; the body needs time to repair and adapt to the stress. When running, ways to increase stress moderately and safely include course variations, training at different paces and distances, inclusion of moderate inclines, fartlek training, and interval training.

Flexibility is a key component of fitness training. Some stretches can be used as part of a warm-up, while stretching for the purpose of increasing flexibility can be done after a workout when the body is warm. Stretch slowly and sustain the stretch for 30-40 seconds. You should feel mild discomfort but never pain. Stretching is too often neglected or allotted too little time. Try to devote at least ten minutes at the end of a workout to stretching.

Academy Week	Workout Type	Maximum Durations	Maximum Distance for Endurance Runs	Target Number of Days per Week
One	Cardio Training Resistance Training	16:30 minutes 40 minutes	1.5 miles	1-5
Two	Cardio Training Resistance Training	16:30 minutes 40 minutes	1.5 miles	1-5
Three	Cardio Training Resistance Training	19:15 minutes 40 minutes	1.75 miles	1-5
Four	Cardio Training Resistance Training	19:15 minutes 40 minutes	1.75 miles	1-5
Five	Cardio Training Resistance Training	22:00 minutes 40 minutes	2.0 miles	1-5
Six	Cardio Training Resistance Training	24:45 minutes 40 minutes	2.25 miles	1-5
Seven	Cardio Training Resistance Training	27:30 minutes 40 minutes	2.5 miles	1-5
Eight	Cardio Training Resistance Training	28:53 minutes 40 minutes	2.75 miles	1-5
Nine	Cardio Training Resistance Training	31:30 minutes 45 minutes	3.0 miles	1-5
Ten	Cardio Training Resistance Training	31:30 minutes 45 minutes	3.0 miles	1-5
Eleven	Cardio Training Resistance Training	34:08 minutes 45 minutes	3.25 miles	1-5
Twelve	Cardio Training Resistance Training	36:45 minutes 45 minutes	3.5 miles	1-5
Thirteen	Cardio Training Resistance Training	39:23 minutes 45 minutes	3.75 miles	1-5
Fourteen	Cardio Training Resistance Training	42:00 minutes 45 minutes	4.0 miles	1-5
Fifteen	Cardio Training Resistance Training	42:30 minutes 45 minutes	4.25 miles	1-5
Sixteen	Cardio Training Resistance Training	45:00 minutes 45 minutes	4.5 miles	1-5
Seventeen	Cardio Training Resistance Training	45:00 minutes 45 minutes	4.5 miles	1-5
Eighteen	Cardio Training Resistance Training	47:30 minutes 45 minutes	4.75 miles	1-5
Nineteen	Cardio Training Resistance Training	47:30 minutes 45 minutes	4.75 miles	1-5
Twenty	Cardio Training Resistance Training	50:00 minutes 45 minutes	5.0 miles	1-5
Twenty +	Cardio Training Resistance Training	50:00 minutes 45 minutes	5.0 miles	1-5

One Minute Sit Up	One Minute Push Up	1.5 Mile Run
Phase I MPTC Standard: Female: 18 Repetitions Male: 22 Repetitions	Phase I MPTC Standard: Female: 6 Repetitions Male: 15 Repetitions	Phase I MPTC Standard: Female: 16:30 Male: 16:30
Phase II MPTC Standard: Female: 24 Repetitions Male: 28 Repetitions	Phase II MPTC Standard: Female: 10 Repetitions Male: 22 Repetitions	Phase II MPTC Standard: Female: 15:45 Male: 15:45
Phase III MPTC Standard: Female: 28 Repetitions Male: 34 Repetitions	Phase III MPTC Standard: Female: 14 Repetitions Male: 28 Repetitions	Phase III MPTC Standard: Female: 15:00 Male: 15:00

MPTC Modified Health and Wellness Plan

Definition:

“Modified Health and Wellness” (MHW) is defined as anything less than full participation by a Student Officer during health and wellness training on an academy day. A Student Officer will be considered on MHW for each day that s/he cannot fully perform the health and wellness training and/or assessments required under the current Municipal Police Training Committee’s (MPTC) Health and Wellness Guidelines. This simple philosophy will govern the determination of whether or not a Student Officer is on MHW for the day, no exceptions. A Student Officer must fully participate in health and wellness 70% of the time and can only be placed on MHW for up to 30% of the time before being dismissed, without prejudice, from the academy. Each MPTC academy shall determine the amount of days that constitutes 30% of their health and wellness academy block and notify the Statewide Health and Wellness Coordinator of this fact. Full disclosure to all student officers will also be made at the time of orientation for the upcoming police academy.

Rationale:

It is the strong belief of the Municipal Police Training Committee that in order to obtain the optimum training and proper preparation to become a police officer, a Student Officer must fully participate in all subject areas of the academy a reasonable amount of time, including health and wellness training. The health and wellness academy block is carefully designed to prepare the Student Officer for both the physical and mental aspects of a police officer's job.

It is the belief of the MPTC that participation in a Health and Wellness program will provide the Student Officers with a basic level of strength, cardiovascular endurance and flexibility that is not only required to perform the essential duties of the police officer profession, but is also needed to safely participate in other training areas of the academy such as Defensive Tactics and Applied Patrol Procedure. Furthermore, it is the belief of the MPTC that participation in the Health and Wellness program will also result in a positive effect for the Student Officer both psychologically, (lowered anxiety, increased self-esteem, tools for stress and illness reduction, and career longevity); and physically, (improved tolerance to fatigue, reduced risk during physical tasks, and improved ability to mobilize the body efficiently).

This training will in turn benefit the residents of the Commonwealth of Massachusetts by reducing health costs associated with injured or ill police officers and provide them with a better prepared, more efficient and effective police officer.

Application:

This assignment of MHW to a Student Officer will be a requirement whether the injury/illness occurred within or outside of the academy setting. It will be assigned regardless of if the Student Officer fully misses the health and wellness training for the day due to an absence of any kind or doctor’s note requiring no participation; or partially misses the health and wellness training due to injury, illness or lack of conditioning.

Whenever a Student Officer cannot fully participate in the daily Health and Wellness training or assessments, this fact will be recorded on the proper Municipal Police Training Committee (MPTC) form for that Student Officer. This form will include the date and reason for the Student Officer being considered on MHW, and will be initialed by both the Student Officer and the Lead Health and Wellness Instructor of the day. The Lead Health and Wellness Instructor of the day will be determined at the sole discretion of the Academy Director. The form will be immediately forwarded to the Academy Director for review and signature. On every ninth day of being assigned to MHW, the Student Officer will be required to bring this form back to their police department and have the Chief or his/her designee sign it. This signature will serve as official notice that the department has been made aware of the issue. If a Student Officer fails to have this form properly completed within the time limits set by the Academy Director, s/he will be subject to disciplinary action up to and including dismissal from the academy. If a Student Officer disagrees with the Lead Health and Wellness Instructor's determination that s/he should be considered on MHW for a certain day, s/he must appeal to the Academy Director in writing within twenty-four (24) hours of the determination. After looking at all of the facts surrounding the determination, the Academy Director will then assess the situation. The Academy Director's determination will be final.

Examples:

- If Student Officer Jones is unable to fully participate in a cardiovascular activity per the MPTC Health and Wellness Guidelines (and needs to walk at any point during the training or assessment or is unable to run at least a 10 minute mile), s/he will be considered on MHW for the day.
- If Student Officer Jones suffers a hamstring injury at week 4 and can only participate in upper body training for the next 2 weeks, s/he will be considered on MHW for each day that s/he is not fully participating in lower body training.
- If Student Officer Jones has a cold and comes to the academy but does not perform all of the physical requirements of the day, s/he will be considered on MHW for the day.
- If during a Health and Wellness Assessment (other than the first assessment) Officer Jones cannot perform any of the individual exercises such as push-ups, sit-ups or running for required time or distance, s/he will be considered on MHW for the day.

DISCLAIMER

This guide is intended to provide current and accurate physical fitness information that can be utilized in preparation for a recruit Physical fitness program. It is offered as an information aid only, and is not rendering individual professional or medical advice. Any discomfort, injuries or questions regarding the capability of a person to perform any of the tests, programs, or activities set forth in this guide should be referred to the individual's medical practitioner.

MPTC Physical Fitness Preparation Guide

INTRODUCTION

Physical fitness preparedness will be paramount to your success in completing a training regimen at the MPTC Academy. Statistics have shown that the majority of people that fail to successfully complete the training program fail as a result of not being properly prepared to meet the physical demands of training.

In order to increase your chances of successfully completing the training program at the Police Academy, it is essential to participate in a proper physical fitness routine prior to entering the academy.

It is recommended that you develop and participate in a personal fitness program that meets your individual needs. However, it is important that you adhere to sound guidelines and safe procedures when planning and participating in any fitness program. In preparation of attending the Police Academy and to optimize your safety during an exercise training program, some initial screening for important medical and health factors is necessary. The Physical Activity Readiness Questionnaire (PAR-Q) is recommended as a minimal standard for screening prior to beginning an exercise program. The PAR-Q is designed to identify the small number of adults for whom physical activity might be inappropriate and should have medical clearance prior to participating in an exercise program. If, after reading the following information, you are still not sure how to properly train for increased physical activity, seek out the advice of a trained and certified fitness specialist.

This guide will provide you with current and accepted health and fitness information on various topics of physical fitness. These range from aerobic and strength conditioning to equipment and nutrition planning. Use the information to assist you in developing a physical fitness program in order to better prepare yourself for the training challenges and demands you will encounter at the Police Academy.

PHYSICAL FITNESS

According to the President's Council on Physical Fitness and Sports, physical fitness is the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to engage in leisure time pursuits and to meet the above average physical stresses encountered in emergency situations.

Physical fitness may also be defined as an organic condition of the body which enables an individual to use his or her body in activities requiring strength, muscular endurance, cardio respiratory fitness, flexibility, coordination, agility, power, balance, speed and accuracy - without the experience of fatigue or exhaustion.

STRETCHING & FLEXIBILITY

Flexibility is defined as the range or extent of motion possible within a given joint. Applying the term flexibility to muscles refers to range of motion of the joint and surrounding soft tissue.

There are 4 basic types of stretching:

1. **Ballistic stretching** should be avoided. This involves stretching to your limit and performing repetitive, bouncing movements, usually quickly. This type of stretching may do more harm than good, increasing the risk of tiny muscle tears, soreness, and injury.
2. **Static stretching** is gradual stretching through a muscle's full range of motion until you feel resistance or the beginning of discomfort. You hold the maximum position for 10 to 30 seconds, relax, and then repeat this several times.
3. **Dynamic Stretching** is done by gradually increasing active range of motion about a joint through dynamic movements. Examples include linear and lateral leg swings, arm circles, and torso rotations.
4. **Proprioceptive neuromuscular facilitation stretching** is more complex. One type is called contract-relax stretching. Here you first contract a muscle against a resistance, usually provided by another person, and then relax into a static extension of the muscle.

Prior to and after each exercise session, all recruits will participate in a full body stretching regimen. Stretching before and after physical exercise will help reduce the risk of injuries, enhance athletic performance and increase strength and mobility. Before stretching begins; each recruit will perform a short aerobic exercise (e.g. 60 side-straddle hops). This will allow freshly oxygenated blood to engorge the muscle thus increasing individual performance. Proper stretching will increase flexibility. Increased flexibility will aid in the reduction of athletic injuries.

Some basic rules to follow for proper stretching are:

- Always warm-up by doing light aerobic movements for 5-8 minutes before engaging in a stretch routine
- Stretch before and after your actual workout
- Hold each stretch for 30-40 seconds Stretch for 10 to 15 minutes
- Stretch to the point of mild resistance
- Relax as you hold a stretch Do not hold your breath, Do not lock out joints
- Stretching should be smooth and controlled no bouncing
- Stop the stretch at the first sign of pain.

AEROBIC EXERCISE

Aerobic exercise, also known as Cardio respiratory and cardiovascular exercise, is exercise that requires the use of large amounts of oxygen and use of large muscle groups in a continuous and rhythmic manner for a sustained period of time. Aerobic exercise provides a person with numerous benefits, including but not limited too:

- Decreased blood pressure
- Decreased body fat and triglyceride levels
- Decreased risk of developing cardiovascular disease
- Increased bone density

Before engaging in any cardiovascular exercise, you should understand the four basic components to a cardiovascular program:

- Mode
- Frequency
- Intensity
- Duration

Mode is the kind or type of activity you decide to participate in. Primary aerobic activities include brisk walking, running, swimming and cross country skiing. Secondary aerobic activity could include stair climbing, racquetball and circuit type weight training.

Frequency refers to how often you participate in a type of exercise. Under ideal conditions, aerobic exercise two days a week can maintain a person's current fitness level. However, in order to improve your aerobic conditioning level, 2-5 days of aerobic exercise is usually needed.

FINDING YOUR TARGET HEART RATE

Participating in a proper stretching routine before and after your workout provides the following fitness advantages:

- Reduction of injuries due to the tearing of muscle tissue
- Increases range of motion
- Increases muscular strength
- Promotes muscle relaxation
- Promotes faster recovery from soreness due to strenuous activity
- Promotes better circulation
- Make strenuous activity like running, cycling, and swimming easier

- 1) Find Resting Heart Rate (RHR)
First thing in the morning.
- 2) $220 - \text{age} = \text{MHR}$.
- 3) $\text{MHR} - \text{RHR} = \text{HR Reserve}$.
- 4) $\text{HRR} \times \% \text{ training zone} = \text{IL}$.
- 5) $\text{IL} + \text{RHR} = \text{THR or Training Zone}$.

RHR=Resting Heart Rate
MHR-Maximum Heart Rate
HRR=Heart Rate Reserve IL-
Intensity Level THR=Target
Heart Rate % Training zone
refers the level you wish to
workout. 50 % to 60 % is
usually used for beginners and
65%- 80% used for athletes.

Duration refers to the amount of time you continuously perform an exercise. It is important to remember that in order for an exercise to be aerobic, it must involve continuous motion of the large muscles of the body. How long you exercise will depend on your individual physical conditioning goal. Normally, 15 to 60 minutes of continuous activity is acceptable. Recent research has also shown the exercise duration could be quantified over a period of one day. Simply stated, aerobic fitness levels can improve with as little as 4 minutes of exercise duration, as long as the exercise is of an aerobic or anaerobic mode and performed several times.

Intensity refers to the difficulty of the exercise. With regards to aerobic conditioning, this does not mean harder, more intense levels are better. Moderate intensity levels are almost always more appropriate and enjoyable than high intensity workouts. Individuals that are just starting a fitness routine, suffer from or are recovering from an injury or illness, or are significantly overweight, should first consult with trained medical and fitness personnel before participating in even a low intensity aerobic exercise program.

To receive the maximum benefits from aerobic exercise, the intensity level should be maintained within your aerobic training zone. In general, individuals just starting an aerobic program, people that are at a poor or very poor levels of fitness or significantly overweight, should calculate their training zone between 50-60% of their maximum heart rate (MHR). Individuals that are of average fitness level should calculate an intensity level of between 65-80% MHR. Calculating your training zone can be done using three methods. One of the best and most precise methods of monitoring your training zone is by monitoring your actual heart rate. This can be done manually by taking your pulse or by use of an electronic heart rate monitor. Other more simplified, but less accurate methods are: The Borg Scale or rating of perceived exertion scale and the so-called "talk test," where you should be able to comfortably talk or take on a conversation while performing aerobic exercise.

RPE	
• 6	
• 7	Very, Very Light
• 8	
• 9	Very Light
• 10	
• 11	Fairly Light
• 12	
• 13	Somewhat Hard
• 14	
• 15	Hard
• 16	
• 17	Very Hard
• 18	
• 19	Very, Very Hard
• 20	

Borg Scale of perceived exertion. Exercise between 11 & 15 are considered aerobic.

It is always important to gradually increase your duration, intensity and frequency over a period of time. In addition, the more aerobic training you participate in, the more important it is to cross train or change the mode of the exercise.

A warm-up stretching routine and cool-down stretching routine before and after aerobic exercise is also important to increase the benefits of aerobic exercise and decrease the chances of exercise related injuries.

RESISTANCE TRAINING

There are two types of muscular fitness needed for daily living and for physical performance:

- **Muscular strength:** This is the muscle's ability to generate force. (e.g. bench, 1 rep, squat 6 rep, lift a heavy object).
- **Muscular endurance:** This is the muscle's capacity to perform repeated sub-maximal contractions. (e.g. pushups, reps).

The principles of muscular strength and endurance are:

- **Overload** - To increase strength or endurance at a higher workload than provided by daily activity must be imposed on the muscle.

- **Progression** - Progressively greater workloads must be placed on the muscle to continue improvement.
- **Specificity** - Training effects are specific to the muscle, contraction joint angle, equipment, and demand placed on the muscle.
- **Muscular Balance** – Antagonistic muscle groups should be trained equally.
- **Frequency** - The muscle must work against resistance a minimum of 1-3 times a week consistently.
- **Recovery** – Utilize recovery techniques including active and passive recovery, soft tissue treatments, SMFR, proper nutrition and hydration, and adequate quality sleep.

When planning a weight-training program follow these steps:

- Develop a full body routine
- Perform the routine 2-3 times per week
- Start the program using lighter weight and gradually increase the resistance as strength improves
- Work large muscle groups before smaller muscle groups
- Alternate antagonistic muscle groups
- Do multi-joint movements such as bench press before single joint movements such as curls
- Seek trained professional advice

UNDER RECOVERING and/or OVERTRAINING

Under recovering involves placing an excessive amount of stress on the body without adequate recovery to a point where the body can no longer adapt and adjust, ultimately leading to a breakdown of the body. One of the most common causes of under recovering is doing too much too soon without allowing for proper recovery and associated adaptation. It is important to remember that an increase in physical fitness comes from dedication over a long period of time. Training more than is necessary or desirable, engaging in exercise in an excessive degree, or engaging in an intensity level over your ability is neither wise nor beneficial.

Some signs of under recovering are:

- Loss of appetite
- Sudden dramatic loss in weight
- Cold or flu like symptoms

- Difficulty sleeping
- Changes in mood, depression or irritability
- Constant sore, aching or injured joints and muscles

It is best to design a training program that allows the body to recover. A few tips to follow that will help you prevent under recovery problems are:

- Utilize periodization models that allow for different intensities, body parts, rest intervals, tempos, volume, and exercise selection throughout the week and phases of training.
- Be cautious increasing your intensity level from week to week or month to month
- Allow your body the time to adapt to your training routine
- Rest and maintain a regular sleep schedule
- Incorporate supportive nutrition

DETERMINE YOUR BODY COMPOSITION

One of the greatest misconceptions in regards to a diet and exercise program is that weight loss indicates a successful program. Since weight loss is not always an indication of loss of body fat, body composition should be used in its place. Body composition has proven to be a more accurate and reliable method of determining overall fitness levels, in addition to determining an individual's risk to many types of health related diseases. The three most common ways to determine body composition are:

Body Fat Percent
Body Mass Index or BMI
Waist to Hip Ratio

Body Fat Percent:

Probably one of the most well known methods of determining body composition is body fat percent. Body fat percent is determined by various methods. The most common method is using a device called a skinfold caliper. By measuring folds of skin with subcutaneous fat at various locations of the body, an average percentage of body fat can be calculated. Other methods such as

Hydrostatic Weighing, Ultrasound, DEXA and Bioelectric Impedance are other methods. However, these methods are often times cumbersome and expensive and usually achieve similar results as the fat caliper method.

With all body fat calculation methods, it is important to remember that a margin of error exists, and even the most accurate results are estimate calculations and contingent on numerous factors. As a result, body fat percent should be used more for the purposes of result comparison over a period of time to determine the effectiveness of your fitness program, rather than a single measurement to determine average body fat percent.

Maximum Desirable Body Fat Levels (+/-: 2%)

Male		Female	
Age	% Body Fat	Age	% Body Fat
≤24	15%	≤20	17%
25-27	17%	20-22	18%
28-29	18%	23-25	19%
30-32	19%	26-29	20%
33-39	20%	> 30	22%
>40	22%		

(Durnin et al 1985, Katch & McArdle 1973, Durnin & Rahaman 1967, Royal College of Physicians 1983.

Body Mass Index: (BMI)

Since BMI is a measurement of an individual's "mass" rather than body fat or weight alone, it is considered a predicator to the development of chronic diseases such as high blood pressure, heart disease and diabetes. BMI is calculated by obtaining a ratio between your weight and height. A BMI ≥30 has been shown to be a potential risk factor of an individual's risk of developing a health disorder. To calculate your BMI use the following equation:

$$\text{BMI} = \frac{\text{weight in lbs.} \times 703}{\text{height in inches squared}}$$

BMI Norms*

Emaciated	Less than 15.0
Severely underweight	15.0 to 16.9
Underweight	17.0 to 18.9
Normal weight	19.0 to 24.9
Overweight	25.0 to 29.9
Obese	30 to 39.9
Severely obese	40.0 or more

* Information taken from: Whitney E, s Rolfes, Understanding Nutrition, 6th ed. NY: West Publishing Co. 1993 p255

Waist to hip Ratio:

Location of where body fat accumulates is also an important predictor of various types of disease. Regardless if you are overweight or not, increased fat distribution viscally or primarily around the waist is an important independent risk factor for diseases such as diabetes and stroke.

A ratio consisting of measurements from the narrowest point of the waist and the widest point of the hips determines your risk.

Male at risk above .8* Female at risk above .9*

* Pentz, Jane, Nutrition for professionals, 5th ed. MA: LMA Publishing, 1999 p99

TRAINING LOGS

Training logs are used to ensure improvement in cardio-respiratory (aerobic), muscular strength and/or muscular endurance conditioning. This is accomplished by helping to:

- Remember and record the details of each workout session
- Monitor the frequency of workout sessions
- Receive adequate rest and recovery between workouts
- Keep track of progress

After an aerobic workout always record the frequency, intensity (exercise heart rate), and duration of each workout session. During weight training, always record the amount of weight, sets, and reps for each workout session.

Included in this guide book is an example of a training log record sheet for cardio-respiratory, strength and/or muscular endurance training.

The information below, including an indication of signs and symptoms suggestive of underlying diseases, risk factors for heart disease which, in combination, suggest the need for medical screening, and a list of conditions which may increase the risk of complications during exercise.

1. Major Signs or Symptoms which Suggest Heart, Lung, or Metabolic Disease:

- Leg pain
- Discomfort, or numbness in the chest, arm, jaw, neck, or back
- Unaccustomed shortness of breath or shortness of breath with mild exertion
- Difficult or painful breathing
- Ankle swelling
- Palpitations or racing heart rate
- Known heart murmur

If you have any of these symptoms, vigorous exercise should be postponed until medical clearance is obtained.

2. Major Heart Disease Risk Factors:

- Systolic blood pressure ≥ 160 or diastolic blood pressure ≥ 90 mmHg (measured on at least 2 separate occasions)
- Serum cholesterol ≥ 240 mg/dl
- Cigarette smoking
- Family history of heart disease or stroke in parents or siblings prior to age 55

If you have two or more of these risk factors, vigorous exercise should be postponed until medical clearance is obtained.

3. Diabetics who:

- take insulin
- have had diabetes for more than 15 years
- who do not take insulin but are over 35 years of age

4. It is also recommended that men over the age of 40 and women over the age of 50 have a physical exam prior to beginning a vigorous exercise program. **"Vigorous" means that the amount of exercise represents a challenge and may result in fatigue within 20 minutes.** Healthy persons of any age should be able to begin a low intensity exercise program without physician clearance provided that they adhere to the above conditions.

No set of guidelines can cover every conceivable situation. In general, if you know that you have a problem or disease, see your physician first. Some other conditions which indicate a need for medical screening include alcoholism, drug use or abuse, problems with dehydration or an inability to tolerate heat, and acute infections (including severe colds and flu symptoms).

Pregnant women, or women who think they may be pregnant, should consult a physician prior to beginning an exercise program if they have not been physically active prior to the pregnancy.

Smoking

Inhaled smoke has been linked to lung cancer, lung disorders, and coronary heart disease. Smoking also affects a person's ability to perform aerobic tasks. The same mechanisms that eventually lead to lung disorders limit the ability of the lungs to take in air and distribute oxygen to the blood. This ability is particularly crucial when performing tasks that involve large muscle groups are continually contracting for several minutes or longer. A candidate who smokes may be specifically affected in his or her ability to climb stairs or walk or run for any length of time, especially while carrying equipment. A smoker may not be able to do as well on an event that involves this type of activity as a non-smoker of similar size, ability and training. Therefore, in order to maximize their potential applicants who smoke are urged to quit smoking as soon as possible. **Candidates are reminded that, by law, they must be non-smokers to work as municipal or MBTA police officers.**

Weight Control

Carrying excess weight in the form of fat will reduce an applicant's performance potential. Excess weight increases the work that the muscles, heart, and lungs have to do when performing tasks. For example, when an overweight person walks up stairs, the leg muscles have to lift more weight. The heart also has to pump more blood to those working muscles, putting additional stress on the heart. When muscles have to work harder, against the stress of carrying excess weight, injuries can result ranging from pulled leg muscles to a heart attack.

In an effort to promote safety and optimal health, it is recommended that overweight applicants try to lose weight. To best accomplish this, overweight applicants should begin a weight reduction program that contains both nutrition and an exercise component. Weight loss can best be achieved by: (a) decreasing the amount of food you normally eat through the reduction of portion sizes, (b) changing a few "bad habits" such as the amount of highly processed, high glycemic, trans-fatty food selections you may be making, and (c) increasing the amount of exercise you are presently getting.

1. Through reduction of food intake

A successful weight loss program always includes an eating plan designed to provide the right amount of vitamins, minerals, and calories to avoid hunger pangs and any possible nutrient deficiencies. Nutritionists suggest the following method to assess your current calorie intake and to cut back calories appropriately. To determine your current caloric intake: **multiply your present weight by the number 15.**

The answer is the average number of calories you are eating daily to maintain your current body weight. The number 15 is used because it takes approximately 15 calories to maintain one pound of body weight.

Now that you know the average number of calories you're eating, to lose weight, you need to reduce this amount by between 500-1000 calories per day. To demonstrate the effect of reducing your calorie intake, look at the following examples:

3500 calories = 1 pound of body weight
500 calories x 7 days a week = 3500 calories (1 pound) 1000
calories x 7 days a week = 7000 calories (2 pounds)

By cutting back 500 calories per day, you will be able to lose approximately 1 pound of body weight per week. Cutting back 1000 calories per day allows you to lose approximately 2 pounds of body weight per week. Losing any more than 2-3 pounds of body weight in one week could be detrimental to your health and also increases the chances of gaining the weight back more quickly. So go slowly and steadily.

Some people will lose less than a pound one week and 2 pounds the next. There often is no clear way to gauge weight loss, but be confident that if you're cutting back on calories, you will definitely see a difference over the long haul.

2. **Through exercise** An exercise program is also a key component of losing weight and keeping it off. For example, if you don't want to cut your calories by 1000 per day but still want to lose 2 pounds of weight per week, you can cut calories by 500 and increase exercise by 500 calories. The results will be the same ... a 2 pound weight loss. Here are some examples of ways to burn roughly 500 calories through energy expenditure:

Ways to Burn 500 Calories

- walk 5 miles (takes 100 minutes)
- jog 5 miles (takes about 55 minutes)
- climb stairs for 80 minutes
- cycle or row for 60 minutes

3. **Through appropriate food selection** Now that you realize some of your weight loss options, the next step is to select the appropriate foods. Our first aim is to identify the foods you're currently eating that are high in unhealthy trans fats, high fructose corn syrups, chemical or processed ingredients, and sugar. Some examples include:

- Fast foods
- Microwaveable meals
- Margarine
- High glycemic index carbohydrates
- Fried foods
- Highly processed cereals and snacks
- High sugar and fat desserts
- Heavily processed meats containing MSG, nitrites, and nitrates

Although fat is an essential nutrient, most Americans may not be eating enough high quality fats while eating too much low quality fats, especially when combined with high amounts of high fructose corn syrup and sugar. About 20-30 percent of your total daily calories from quality fats may be a good goal for some individuals. Your goal should be to monitor your body composition, fitness level, waist to hip ratio, cholesterol/serum triglyceride levels, resting and reactive blood sugar, and more.

The next step is to assess how many fruits and vegetables you're eating. The recommended number and types of fruits can vary dependent upon individual goals. Vegetables can be eaten cooked or raw to total 2-4 cups per day. In many cases, vegetables can be eaten in any quantity due to their very low calorie content.

Next, assess how many foods you eat from the complex carbohydrate category. The recommendations can vary, dependent upon individual factors including goals, glucose tolerance, bodyfat %, and activity levels. Several studies have shown low to moderate carbohydrate diets to be effective in weight and bodyfat loss, while other studies have pointed toward a balanced macronutrient approach.

Examples of complex carbohydrates include: brown rice pasta/noodles, sweet potatoes, corn, peas, dried beans such as navy, pinto, garbanzo and black beans, quinoa, and more.

Protein rich foods include beef, fish, chicken, bison, eggs, milk, Greek yogurt, and other dairy products. There is debate regarding quality of protein sources, as studies have found quality, grass-fed, organic meats to contain higher levels of antioxidants and lower levels of antibiotics and growth hormone.

An example of a balanced macronutrient eating plan that can be adapted to your desired caloric intake follows. **The following is an example of a balanced macronutrient Eating Plan:**

Breakfast
3-5 Grass Fed Organic Eggs 2-6 Slices of Organic Uncured Bacon 1 cup of Blueberries (or other low glycemic/high antioxidant berry)
Snack
Cup of macadamia nuts with cup of low glycemic dried fruit
Lunch
Grilled Chicken and avocado on garden salad with Balsamic Vinegar Dressing
Snack
Apple with sunflower or nut butter
Dinner
Baked Cod Brussel Sprouts 1-2 Cups of Brown Rice

Meal Planning

Try to plan for three regular size meals as shown in the example Eating Plan, or five to six small meals every day. The purpose behind this advice is twofold. First, spread your calories out throughout the day allowing adequate blood sugar for energy. Second, by eating periodically, you are never "starving." By withholding calories as in skipping a meal, you allow your blood sugar to drop to low levels leading to cravings for high sugar/fat calories, including candy bars and other immediate sweets, to satisfy the craving. This can actually be prevented by eating regularly.

Select foods that contain carbohydrate, protein, and fat for each meal. Since carbohydrates empty from the stomach the quickest, they provide shorter lasting, more immediate energy. Protein and fat are the nutrients that leave the stomach last, helping to keep you feeling full for a longer period of time, since they stay in the stomach longer. There are many misconceptions and fallacies about diets and exercise. Common misconceptions are discussed below:

1. **TRUE:** Exercise will increase your appetite.

Exercise does increase appetite. Research has shown exercise can have a stimulating effect on the two primary appetite hormones, Ghrelin and Peptide YY, with cardiovascular exercise affecting both, while weightlifting has a greater effect on Ghrelin only. Due to an increase in body temperature during the workout, exercise can actually act as an acute appetite suppressant. Once the body temperature restores back to normal, appetite may then increase. Exercise can also serve to stimulate metabolic rate, or the rate at which you burn calories, for a period of time after the exercise is over.

2. **FALSE:** A lot of extra weight is "water-weight" and you can lose weight by sweating or drinking less fluid.

Exercising in rubber suits, in saunas, or steam rooms will only increase your loss of body water and dehydrate you, giving you a "false sense" of weight loss. Dehydration is not an effective way to lose weight. Since the body is made up of roughly 70% water, it makes sense to drink plenty of fluids each day to maintain proper fluid balance. We lose body fluids without really knowing it through our skin as well as through sweating. Weighing yourself after exercise and seeing a decrease in body weight is not an appropriate way to assess true weight loss. You need to drink fluids to replace lost water. In fact, you should drink a little more water than what quenches your thirst to fully prevent dehydration.

3. **FALSE:** Fad diets are effective in the long term.

These diets can have both an acute and long term effect on your hormones. Altered testosterone, thyroid, and satiety hormone production have been found in individuals who partake in these caloric restriction diets.

4. **TRUE:** Dieting is a short-term way to lose weight.

The concept of "diet" typically implies some form of eating plan that you'll follow for a short period of time. Consequently, losing weight by changing eating habits must be continued to maintain lost weight. By "going off the diet" you will inevitably gain the lost weight back. For better, longer lasting results concentrate on changing bad habits slowly and permanently and include exercise.

5. **FALSE:** Quick-reducing diets are effective.

Diets that promise rapid weight loss are typically short-term programs. When you lose more than 2-3 pounds per week, you are not only losing fat, but also muscle mass and water. As soon as the low calorie diet and/or quick weight loss scheme wears you down, you may revert back to your old habits of

eating and gain all the lost weight back, and potentially, more.

6. **FALSE:** You can spot-reduce in specific areas of your body through diet.

While certain hormones do play a role in body fat distribution patterns, you cannot effectively "spot-reduce" through dietary and training means alone. In other words, by cutting back on your calories or changing your macronutrient content, you cannot specify where the changes in body fat reduction will occur. By exercising specific body parts, you can effectively strengthen and hypertrophy certain muscle groups to give you a leaner, stronger look, but fat does not selectively disappear from those areas.

Three primary factors play key roles in determining weight loss in any given individual. The first is heredity: If you were born to overweight parents, you may have a predisposition to being overweight. As a result, your ability to maintain or lose weight easily may be somewhat impaired due to 'your genetics, but can be overcome through conscious effort. Secondly, environment plays a big role. What kinds of foods do you keep in the house, where do you socialize and does socialization usually mean food? Third, what is your activity level? Are you typically a more sedentary person? Try watching less television and work on more projects in the evening. Do you snack while sitting around? Try more movement in general. Think about where you can fit in exercise. Other factors may include hormonal profile, toxic burden, PH balance, sleep patterns, and stress tolerance.

In conclusion, successful, long-term weight loss involves many factors. Cutting back calories or altering macronutrient content are critical to weight loss, but it won't make you more fit or promote long-term weight management. That's where exercise fits in. The combination of supportive nutrition and healthy activity levels is an effective approach. Set some realistic (1-2 pounds per week) goals for weight loss through a change in eating habits and increased exercise.

Keep food records to assess accurately what you are eating. Write down everything you eat for about a week and assess where you think some changes could reasonably be made. Keep an activity log. Strive to add a few extra minutes of activity periodically until you reach 30-60 minutes of exercise a day.

PRINCIPLES OF TRAINING:

Terms

Some of the terms used in this training program are explained below, as are some of the principles upon which this training program is based. (Sharkey, 1979)

Physical Fitness

Physical fitness is defined as "the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure-time pursuits and to meet "unforeseen emergencies" (President's Council on Physical Fitness and Sports). An adequate level of physical fitness is required to perform many jobs, to provide energy for recreational activities, and to help avoid certain diseases (such as heart disease and osteoporosis). Physical fitness consists of the following components: cardiovascular fitness, muscle strength, muscular endurance, and flexibility. In order to perform optimally at work and in our other daily activities it is necessary to develop and maintain adequate levels of fitness in each of these components. The training program is designed to develop all components of fitness because of their role in maintaining good overall health.

Cardiovascular fitness (aerobic endurance, stamina) is a measure of heart and lung function. It is the ability to maintain whole body activity for a length of time without fatiguing or running out of breath. An adequate level of cardiovascular fitness is also associated with decreased mortality from many diseases.

Muscle strength (also referred to in this Preparation Guide simply as "strength") is a measure of the greatest amount of force a muscle can apply; that is, the most weight a muscle group can move one time. In addition to its importance in many job-related tasks, improving muscular strength also helps prevent injuries to the muscles and makes bones and tendons stronger.

Muscular endurance is a measure of a muscle's ability to maintain a sub-maximal force or repeatedly apply a sub-maximal force without a rest; that is, the number of times you can lift a certain amount of weight. Adequate levels of muscular endurance allow your muscles to perform a task for a longer period of time before the muscles get tired. Poor endurance of the back and abdominal muscles has been implicated in the low back pain suffered by American adults.

Flexibility is a measure of the range of motion at a joint. Adequate levels of flexibility are necessary in order to make daily movements with ease and to help prevent injuries to muscles and joints. In addition, there is evidence to suggest that inadequate flexibility of the back and legs is related to low back pain.

Adaptation

The stress of repeated exercise produces changes in the body that are called training effects. Your body undergoes some changes in structure and function that allow it to respond better to the demands of physical work and exercise. The body adapts to the extra demands imposed by training by undergoing the following changes:

- Heart function and circulation are improved.
- Blood pressure and cholesterol levels are improved.
- Muscle strength and muscular endurance are improved.
- Muscle mass increases.
- Fat mass may decrease.

Training consists of exercising specific muscles or muscle groups and stressing different systems of the body. It involves having the muscle or muscles apply and maintain a force for a short time and/or repeatedly. Calisthenics, weight training, stretching, and aerobic activity are all important training methods that will result in adaptations that will enable the body to perform more effectively. The rate of improvement or adaptation is related to the following:

- Frequency of activity (the number of times per week).
- Intensity of activity (how hard you train).
- Duration of training (the length of each training session).
- Your initial fitness level.

Overload

For improvement in fitness level to take place via adaptation, a part of the body must be subjected to more than it is accustomed to. For example, in order for muscular strength to improve, the muscles must apply a greater force than they normally would apply during regular daily activities. This increase in intensity of force, or overload, elicits an adaptation. Increasing the duration of an activity would also be an overload. As the body adapts to an increased load, more load must be added to continue adaptation.

Specificity

The body adapts specifically to the type of training it receives. The type of training must be related to the desired results or to the purpose of the training. Aerobic activity will cause very different body adaptations than will weight training. Thus, heavy weight training is of little value for long duration cardiovascular endurance,

while long slow distance running is not particularly useful for developing upper body strength. In addition, adaptations are specific to the muscle groups that are trained. Thus, stretching the shoulder muscles in order to improve shoulder flexibility will not improve flexibility at any other joint, nor will it improve strength of the shoulder muscles. Performance of an activity improves when the training is applied to the same muscle groups as are used in the activity in the same way they are used in that activity.

One especially important use of training specificity for police officers is stair climbing. In particular, climbing down stairs involves an action which stretches (rather than contracts) the muscles of the front of the legs. Depending on several variables, this may cause muscle tissue breakdown, which can then lead to muscle soreness. Training that specifically involves stair climbing (up and down, repetitively) will decrease potential for muscle soreness and related problems.

One exception to this specificity principle is cardiovascular endurance. The heart-lung system involved in cardiovascular endurance is vital in all activities that require large muscle groups to be active for any length of time. The specific activity used to train the cardiovascular system is, therefore, not critical, unless one is competing in high level athletic events.

Use and Disuse

The body needs activity and does not "wear out." Lack of activity results in weak muscles, including the heart, poor circulation, shortness of breath, increased body fat and weakening of bones and connective tissue. Regular activity results in good muscle tone, a strong heart, good circulation, endurance, and strong bones and connective tissue (ligaments, tendons, etc.). It has been said that "the human body is made for movement".

Individual Response

Individuals respond differently to the same training program. The differences in response may be the result of any of the following factors: heredity, physical maturity, state of nutrition, habits of rest and sleep, level of fitness, personal habits such as smoking and alcohol intake, level of motivation, the environment, and the influence of physical disability, disease, or injury.

Warm-up

Warm-up is a gradual increase in intensity of physical activity and should always precede strenuous activity. A 5-10 minute warm up period allows the individual to:

- Mentally prepare for exercise,
- Increase body temperature slowly,
- Stretch the muscles and joints, and
- Increase heart rate and breathing gradually.

Warm-ups may consist of low intensity aerobic activity such as walking or slow jogging followed by calisthenics, light stretching, dynamic stretches, and dynamic movements.

Stretching

Muscles groups should be stretched in order to improve flexibility about a joint. Static stretching exercises should be performed slowly and gently, without any bouncing, bobbing, jerking or lunging, while dynamic stretching utilizes active movements with gradual increases in range of motion. Stretching exercises can be performed as part of the warm-up, following 5 minutes of low intensity aerobic activity or as part of the cool-down phase.

Calisthenics

Calisthenics are exercises that can be performed without equipment, although hand, ankle weights, or weight vest may be used. These types of exercises can be used to develop strength, muscular endurance, and flexibility. Calisthenics usually involve the repetitive lifting and lowering of a body segment as in push-ups, curl-ups, and arm circles.

Weight Training

Weight training consists of exercises that involve moving a weight that is external to the body. Such exercises are used to develop strength, muscular endurance, and range of motion. Particular care must be taken if free weights (e.g., barbells) are used in training. They may cause injury if they fall on a person or if undue strain occurs in trying to control the weight (for example, to keep it from falling). This can happen as a result of the hands slipping, if a person attempts to lift a weight that is too heavy for him/her to support, or if poor technique is used. For these reasons, weight machines or dumbbells may be safer for novices to use in weight training. If you use free weights for weight training, be sure always to work with a partner who can assist you.

Aerobic Training

Aerobic training improves cardiovascular fitness. The training of the cardiovascular system is accomplished by continuous rhythmical motion over time, using large muscle groups. Jogging, bicycling, stair climbing, rowing, walking, swimming, hiking, cross country skiing, skating, and aerobic dancing are good activities for aerobic training.

Cool-Down

The cool-down phase is as critical as the warm-up and should last 5-10 minutes. This phase of activity is important for the following reasons:

- It allows heart rate to decrease gradually.
- Continued activity maintains adequate circulation, prevents pooling of blood, and hastens recovery.
- It provides a time for thorough stretching and relaxation activity.

Cooling down consists of slowing down your activity, walking, light calisthenics, and stretching exercises.

Unusual Reactions

If, during or immediately after exercise, you have any of the following reactions, stop exercising immediately and consult a physician as soon as possible:

- Labored or difficult breathing (not the deep breathing normally associated with exercise)
- Loss of coordination
- Dizziness
- Tightness in the chest
- Sharp pain in any muscle or joint
- Numbness

Assessing Your Current Level of Fitness

This section contains instructions for a simple fitness test that you can use to assess your current level of fitness. Take the test now, before you begin a fitness program, to determine your current level of fitness. Also, take the test at several intervals in your training period prior to the start of academy to measure your progress.

The events described in the fitness test are related to the four areas of fitness. A sit and reach test measures flexibility. Curl-ups, push-ups, a flexed-arm hang, dips and a jump and reach test measure muscular strength and endurance. A 1.5-mile run measures cardiovascular fitness.

Keep a record of your results each time you complete the test. Do not be concerned about how your results compare to national standards. Use your results to monitor your progress, to provide motivation, to establish goals, and to determine the effectiveness of your training program.

Here is a list of the equipment and facilities you will need to conduct the fitness test.

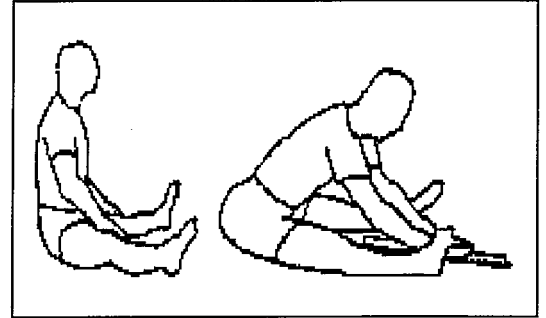
- Yard stick and some masking tape
- Stop watch
- High bar to hang from (about 3/4 inch in diameter)
- Newspaper
- 12 inch high step
- 1.5 mile measured distance (a high school track or measured running path)
- Scale to measure body weight
- Score sheet (included at the end of this section)

Fitness Test Descriptions and Instructions

Before beginning the fitness test, do five to ten minutes of warm-up. See the warm-up exercises section of the guide.

1. Sit and Reach

. Tape a yard stick to the floor at the fifteen inch mark. Sit on the floor with the yardstick between your legs and the zero mark on the yardstick toward you. Keep your legs straight and place your heels even with the fifteen inch mark on the yard stick. Place your hands in front of you, one over the other. Slowly stretch forward, sliding your hands along the yardstick as far as possible. Do not bounce or lunge. Lean forward and stretch slowly as far as you can. Record the farthest distance you can reach in three tries to the nearest inch.



2. Sit-Ups

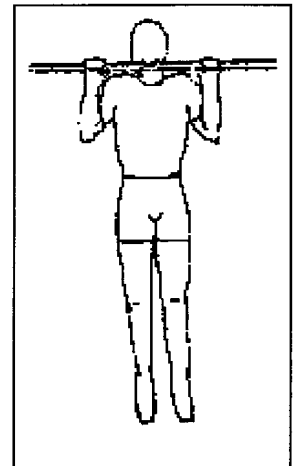
5.



Lie face up on the floor with legs bent and lower back flat against floor. With arms crossed your chest, using the abdominal muscles, pull head and shoulders off of floor until upper body is perpendicular to the floor and elbows over knees. Return to start position with shoulder blades touching the ground in a controlled manner. Record the number of sit-ups completed.

3. Flexed-Arm Hang

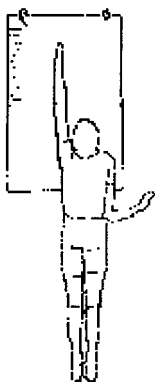
Assume a flexed-arm position, palms facing away from your body, with your chin above the bar. Hold as long as possible. Record the amount of time you can remain with your chin above the bar. As you progress in the flexed-arm hang, feel free to begin adding (if you are able) properly performed, full range of motion pull-up and chin-up variations.



4. Push-ups

Lay flat on the floor in a prone position with head neutral. Align the top of your fingertips with the tops of your shoulders. Your hand width should be anywhere from just below to just outside your shoulders. Legs may be straight with weight on toes, or bent, with weight on knees if your initial strength level is low (if you can't do three or four toe push-ups). Push up, keeping the back straight and upper arms at angle of 45 degrees or less relative to the body. Lock out arms at the end of concentric motion for .5-1.0s. Return until the chest almost touches the floor. Repeat as many times as possible. Record the number of full range of motion push-ups completed.

5. Jump and Reach



Tape a piece of newspaper to the wall above your head. Using the yard stick, make marks on the newspaper at one inch intervals. Dip the fingers of your dominant hand into some water. With your dominant side toward the paper, jump as high as you can, reaching up with your dominant hand. At the top of your jump, touch the paper with your wet fingers. Repeat. Record the height of the highest jump out of two tries.

6. 1.5 Mile Run

Determine the starting and end point for a 1.5 mile distance. Run and/or walk as fast as you can to cover this distance. Record the time it takes to complete the 1.5 mile distance.

FITNESS PROGRAM

General Directions for Fitness Program

The fitness program is divided into the following sections:

- Warm-up
- Strength and Muscular Endurance Exercises (Calisthenics and Weight Training)
- Aerobic Training Exercises
- Cool-Down

The strength and muscular endurance exercises do not have to be done on the same day or during the same exercise session as the aerobics program. In other words, they may be done on separate days or at different times on the same day. However, every exercise session should be preceded by a warm-up period and followed by a cool-down period. For example, if the strength and muscular endurance exercises are done on the same day but at a different time than the aerobics program, warm-up and cool-down exercises should be performed before and after each of the two exercise sessions.

The warm-up exercises are designed not only to get a person physically and mentally ready for the muscular and/or aerobics exercise sessions, but also to help develop flexibility in various joints. The strength and muscular endurance exercises can be done in one of two ways, depending on the availability of equipment. Some degree of strength and muscular endurance can be developed by doing calisthenics which require little or no equipment but is more typically accomplished by training with weights. Training with weights can be done either by using free weights, such as barbells, or by using weight machines, for example, "Universal" or "Nautilus" systems. Once a program has begun using a particular method for strength and muscular endurance exercises, it should be continued for the duration of the training period for comparative purposes.

Since there are no equipment requirements for the aerobics training, the same program can and should be followed by everyone regardless of the particular program (Le., calisthenics vs. weight training) chosen to develop strength and muscular endurance. A weekly log sheet is provided so that applicants can keep track of their progress in developing strength, muscular endurance, and cardiovascular fitness. Two types of log sheets are provided, one for calisthenics and aerobics (for those individuals who use calisthenics to train for strength and muscular endurance), and one for weight training and aerobics (for those individuals who use weights to train for strength and muscular endurance). Of course, applicants should use the log sheet that is designed for the particular exercise program they've chosen to follow. Copies of the log sheet will have to be made for each week of the training program.

Training for the Academy

The stretching exercises have been selected to help develop flexibility in the major joints of the body. Although flexibility will be of particular importance to events that involve performing an activity within a confined space or under conditions that confine one's movement, it will play role in all the academy events.

Appropriate preparation for the Basic Recruit Academy will require the development of strength and endurance in the muscle groups that will be used when performing activities. Muscle strength will be particularly important to those events that require a single application of force such as is involved in dragging a victim over a distance. Both muscle strength and muscular endurance will be important to those activities that involve maintaining a force or the repeated application of a force over a period of time such as is involved in dragging a hose and carrying equipment over a distance. Like flexibility, muscular endurance also will be important to performance as a whole since there will be repeated instances, across events, in which force will need to be applied. Once again, an exercise program that consists of calisthenics or weight training can be used to develop in these areas.

Research suggests that when a female recruit can perform more than 10 pushups and run 1.5 miles in less than 15:20, she has a 95% likelihood of graduating from the academy. If she can complete more than 20 pushups and run 1.5 miles in under 14:00, she has a 98% likelihood of graduating from the academy. Males who can complete more than 20 pushups and run 1.5 miles in under 15:20 have a 95% likelihood of graduating from the academy, while males who can complete more than 40 pushups and run 1.5 miles in under 12:30 improve their likelihood of graduating from the academy to 98%.

Finally, it will be necessary for applicants to develop cardiovascular fitness to perform those events that involve continuous activity over an extended period of time, such as running or the step-mill, as well as to endure through the entire series of test events. As previously mentioned, the aerobic demands of stair climbing, simulated by the step-mill, are very specific, as are running, rowing, and cycling.

The sections which follow describe the exercises that you can perform to develop the four categories of fitness identified previously. The Warm-up Exercises section describes the warm-up exercises which are useful for the development of flexibility and an essential component of any exercise regimen. The Calisthenics and Weight Training sections describe the calisthenics and weight training exercises that can be used toward the development of muscle strength and muscular endurance. The Aerobic Training Program section provides an aerobic training program aimed at enhancing cardiovascular fitness. Finally, the Cool-down section provides cool-down exercises which will aid in recovery from exercise, help develop flexibility and are an important component of any exercise program.

Warm-up Exercises

The warm-up period should last 5-10 minutes. The whole set should be performed before each exercise session. If the strength and muscular endurance exercises are performed on different days or at different times of the day than the aerobic exercises, the warm-up should be performed before each separate exercise session.

Each static stretch should be performed in a slow, gentle manner. Move to the point that a stretch, not pain, is felt in the muscle. Hold that position for 10-20 seconds. Repeat each exercise three to five times. Dynamic stretches can be performed for distance or repetitions. Several static and dynamic stretches are listed below.

Dynamic Movements

Jog	High Knees
Butt Kickers	Russian Kicks
Lunge to HF Stretch	Carioca
Backpedal	Bear Crawl
Calisthenics	Body Squats
Lunges	Pushups
Jumps	Jump Rope
Leg Swings	Arm Swings

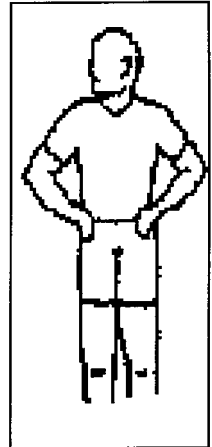
Exercise Descriptions

The following stretches are effective for improving flexibility in each muscle group. Begin your warm-up period by performing light aerobic activity, such as marching or jogging in place and arm circles.

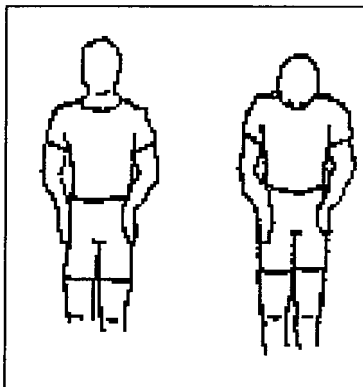
1. Side-to-Side Look

Stretches the neck muscles.

Slowly turn head and look to right. Then slowly turn head back to center and look to left.



2. Forward and Down Look



Stretches the neck muscles.

Slowly look downward. Don't put chin on chest.

3. Standing Cat Stretch



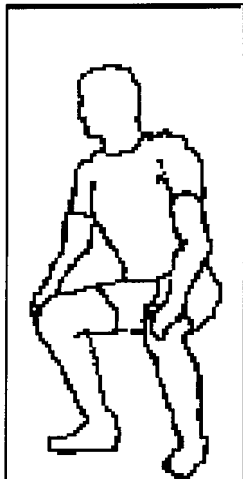
Stretches the upper and lower back

Stand with feet lightly wider than shoulder-width apart. Keep knees bent. Hinge forward at hips and place hands just above knees. Do not bend at the waist. Begin with back straight and flat, arch back up pulling in with abdominals and curl chin towards chest. Return to flat back position. Do not arch back down past the flat back position.

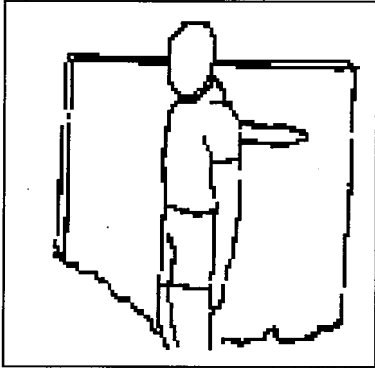
4. Shoulder Turn

Stretches the lower back.

Stand with feet slightly wider than shoulder-width apart. Keep knees bent. Hinge forward at hips and place hands just above knees. Do not bend at the waist. With back straight and flat, gently press left shoulder downward and bring right shoulder upward with a smooth twisting motion. Repeat on other side.



5. Chest Stretch



Stretches the chest muscles

Stand next to wall approximately 8-12 inches away. Extend arm back placing palm of hand on wall below shoulder level. Thumb faces the ceiling. Slowly rotate body away from wall. Repeat on other side.

6. Shoulder Stretch

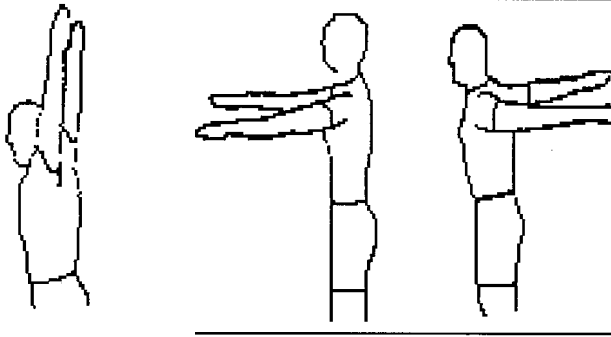
Stretches the shoulders and upper back muscles.

Stand up straight with feet shoulder-width apart and knees slightly bent.

Reach left hand across body to right shoulder. Use right hand to hold arm. Place right hand on back of left arm just above the elbow. Gently press the left arm with the right hand. Do not rotate torso. Repeat on other side.



7. Arm Circles



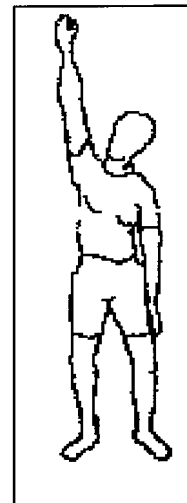
Stretches the chest and shoulder muscles

Standing with feet shoulder width apart and knees slightly bent, perform slow, full arm circles backward 5 to 10 times, then forward the same number of times. The thumb-side of the hand should always lead and the arms should brush past the ears and the sides of the trunk.

8. Side Stretch or Reach

Stretches the muscles on the sides of the trunk.

Standing with feet shoulder-width apart and knees slightly bent, place the left hand on the right outer thigh and extend the right arm overhead with the thumb pointing backward. Reach straight up with the right hand as you slide the left hand down your thigh towards your knee until you feel a stretch up your side. Do not allow the right foot to rise from the floor. Reposition the arms and do the same on the other side.



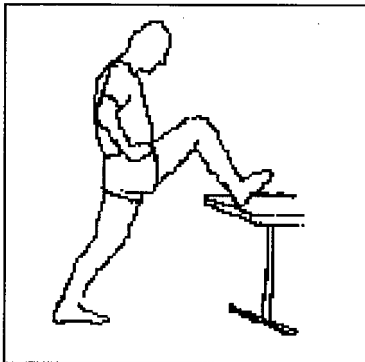


9. Wall Lean

Stretches the muscles in the back of the lower legs.

Stand about arm's distance away from a wall and feet slightly apart. Put both hands on the wall. Keeping the heel on the floor, toe slightly turned in and the leg straight, slide one foot back until a stretch is felt in the calf. Repeat on the other side.

10. Stride Stretch



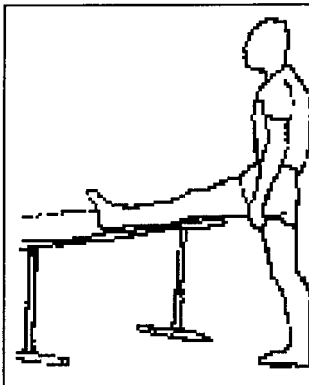
Stretches the muscles in the front of the thigh.

Stand facing sturdy bench approximately 2-3 feet high. Keeping hips and shoulders straight forward, place one foot flat on top of bench. Maintain erect posture while pushing hips forward until you feel the stretch in the front of the hip. Do not allow the front knee to go beyond the mid-foot. Repeat on the other side.

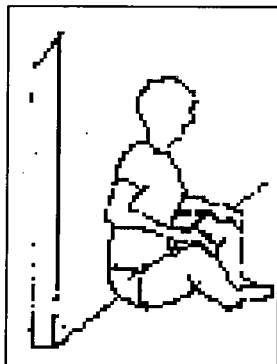
11. Hamstring Stretch

Stretches the muscles in the back of the thigh

Stand facing sturdy bench approximately 2-3 feet high. Keeping hips and shoulders straight forward, place one heel on top of bench. Maintain a flat back while hinging slightly forward at the hips until you feel the stretch. Do not bend at the waist.



12. Groin Stretch



Stretches the muscles of the inner thighs and hips.

Sit with your back flat against the wall. Bring the soles of your feet together and allow your knees to drop to the floor. Gently press the knees toward floor with hands.

6.

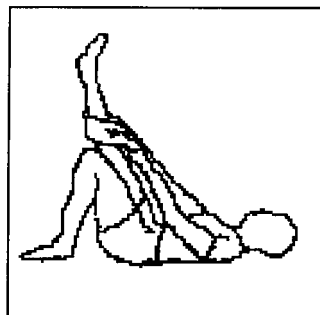
13. Knee to Chest

Stretches the muscles in the lower back and the back of the thighs.

Lie on the floor on your back. Pull one knee toward chest with hands clasped behind your bent knee. Repeat with other leg. Finally, pull both knees toward chest.



14. Supine Leg Stretch



Stretches the muscles of the back of the thigh.

Lie on the floor on your back with one leg bent and foot flat on the floor and the other leg extended in the air. Wrap a towel behind the extended knee. Slowly pull the leg back toward your head. Repeat on the other side.

CAUTION: When it comes to stretching, you should feel the stretching sensation in the muscle, NOT the joints. If you feel pain in the joints, check to be sure you are using the correct position to do the exercise, reposition yourself as necessary, and try again. If you still feel pain in the joints, avoid that exercise.

Flexibility refers to the ability to move the muscles and joints through the full range of motion for which they were designed. Full range of motion and flexibility training is often the most forgotten component of physical fitness when in reality it should be included in every fitness-training program.

The benefits are as follows:

1. It can enhance a recruit's performance of many types of skilled movements;
2. It can increase a recruit's mental and physical relaxation;
3. It can promote development of a recruit's body awareness;
4. It can reduce a recruit's risk of joint sprain or muscle strain;
5. It can reduce a recruit's risk of back problems;
6. It can reduce a recruit's muscle soreness;
7. It can prevent the loss of joint mobility;
8. It can prevent injury from sudden mishaps;
9. It can reduce the severity of painful menstruation for women;
10. It can prevent muscle tendon shortening that may result from inactivity, muscular asymmetry, age and disease.

Stretching refers to the process of elongating the soft tissue about a joint with the intention of restoring or improving range of motion. Stretching is an important component of fitness, especially as we age. It is important to stretch every muscle group after proper warm up. This task may improve your flexibility and relieve muscle soreness. An increase in flexibility can help in preventing injury, enhancing performance, and maintaining daily function as you age. Each stretch should be held anywhere from 10-60 seconds.

Stretching should not be conducted in the following circumstances:

1. Within the first 24-72 hours following a muscle or tendon trauma;
2. Following muscle strains and ligament sprains;
3. When joints or muscles are infected, inflamed or hurt;
4. After a recent fracture;
5. When sharp pains are felt in the joint or muscle;
6. When discomfort is present;
7. If osteoporosis exists or is suspected.

Calisthenics

Calisthenics are exercises that use body weight as the load or resistance. The following exercises were selected in order to increase the strength and muscular endurance in the muscle groups that will be utilized in the Basic Recruit Academy. The exercise routine should be performed 3 to 4 times per week. To begin with, each exercise should be performed as many times as possible at a continuous, steady pace, and that number repeated for each exercise during the first week. Thereafter, the number of repetitions for each exercise should be increased by at least the number indicated for each exercise below. Remember to keep a performance log.

Exercise Descriptions

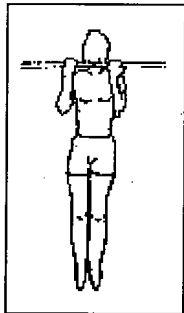
These exercises are listed in the suggested order of performance. Be sure to complete a warm-up period before doing these exercises.

1. Push-ups

For the chest, shoulder region and back of the upper arms.

Lay flat on the floor in a prone position (face down) with head neutral. Align the top of your fingertips with the tops of your shoulders. Your hand width should be anywhere from just below to just outside your shoulders. Legs may be straight with weight on toes, or bent, with weight on knees if your initial strength level is low (if you can't do three or four toe push-ups). Push up, keeping the back straight and upper arms at angle of 45 degrees or less relative to the body. Lock out arms at the end of concentric motion for .5-1.0s. Return until the chest almost touches the floor. Repeat as many times as possible. Record the number of full range of motion push-ups completed. Aim at increasing by at least 1 push-up per week.

2. Chin-ups

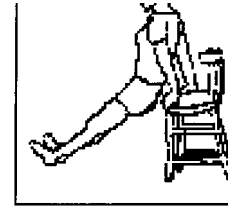


For the shoulder region and arm flexion.

With a supinated grip (palms facing you), grasp the bar with hands roughly shoulder width or slightly closer. Hang from the bar with arms fully extended. Keeping head neutral or looking up slightly, initiate upward pull by retracting shoulder blades toward each other, then begin to pull your chest toward the bar until your chin is over the bar. Lower slowly back to the arms full extended start position. Try to increase by at least 1 per week.

3. Dips

For the muscles in the arms, shoulders and chest. Grasp the sides of a chair and let your feet slide forward while supporting your weight on your arms. Lower your body by bending the elbows to about 60 degrees and then push up to the starting position. Keep body close to the chair. Increase by at least 1 per week.

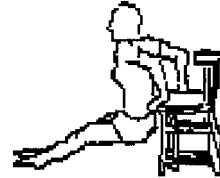


4. Chair Squats

For the leg Muscles



Stand about 6 inches in front of a chair facing away from the chair. With feet slightly wider than shoulder-width, move hips back as you squat until the thighs are almost parallel to the ground, without sitting down on the chair. The kneecaps should be aligned towards the second toe. Hold for 1-2 seconds. Return to the standing position. Increase the number of squats by at least 1 per week, up to a maximum of 25. As an advanced exercise, the exercise can be done with a weight secured to the back, for example, a backpack. Once you are comfortable with the technique and are able to perform 25 repetitions, feel free to progress to body squats. The technique is similar to that of the chair squat, keeping our heels in contact with the ground, torso as erect as you can maintain it, knees in line with the direction of the toes, head posture neutral, while squatting to a depth that you can comfortably achieve without pain or breakdown of posture/technique.



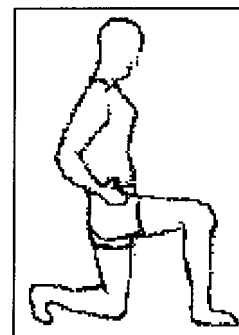
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5. Lunges and Forward Traveling Lunges

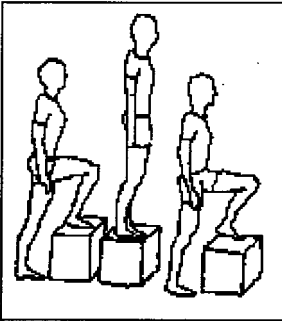
For the leg muscles.

Stand with feet hip-width apart in a stride position and hands on hips. Lower the body directly between the feet by bending the knees to until hamstring touches calf or any discomfort or pain is felt as the flexion angle of the knee decreases. Maintaining the front leg heel down, torso perpendicular to ground and pushing through the ball of the foot, press back up to starting position. Perform the same number of lunges on the other side. Increase the number of lunges by at least 2 per week, up to a maximum of 25.

Variation: Step forward with right foot and lower the body weight to a lunge position. Lower the body directly between the feet by bending the knees to until hamstring touches calf or any discomfort or pain is felt as the flexion angle of the knee decreases. Maintaining the front leg heel down, torso perpendicular to ground and pushing through the ball of the foot, press back up to starting position. Alternate legs.



6. Bench Steps



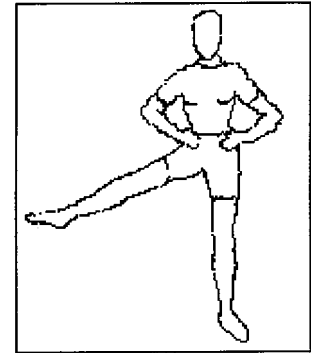
For the leg muscles.

Step up onto a bench that is 8-12" high, bringing up both feet and then down again, one at a time, for 30 seconds (up-up-down-down). Switch the lead foot and repeat for 30 seconds. Increase the time for each lead foot by 10 seconds per week, up to a maximum of 60 seconds of 'stepping up and down with each lead foot.

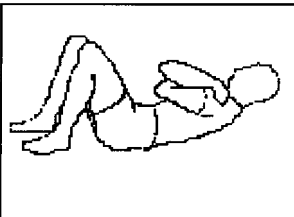
7. Standing Side Leg Lifts

For the hip and outer thigh muscles.

Stand with feet shoulder-width apart and hands on hips. Transfer body weight completely to the left leg. Lift a straight right leg directly to the side. Lower right leg just short of resting foot on the floor then lift again. Maintain erect posture. Perform the same number of lifts on the other side. Increase the number of lifts by at least 2 per week, up to a maximum of 25 per side.



8. Curl-ups



For the abdominal region.

Lie face up on the floor with legs bent and heels approximately 8-12 inches from buttocks. Using abdominal muscles, tilt hips towards ribcage as you raise head and shoulders off of floor pressing lower back towards floor. Eyes stay focused over knees. Hands and arms may be supporting head, crossed over chest, sliding up legs or resting on floor. Increase by at least 2 per week.

9. Opposite Arm and Leg Lifts

For the muscles of back, buttocks and the back of the legs.

Lie face down on the floor with forehead resting on a towel. Arms are stretched overhead with hands shoulder-width apart. Raise the left arm and the right leg approximately 4-8 inches from the floor. Lower to starting position. Repeat on other side. Increase by at least 1 per week, up to a maximum of 15 raises per side.

10. Hand-Grip Strength

For the finger and hand muscles

Use a rubber ball or any commercially available spring loaded hand grip device. Grip and squeeze the ball with one hand 8 times and then alternate to the other hand and grip and squeeze 8 times. Repeat the sequence 4 times for each hand. Increase the number of contractions per hand by 2 each week while keeping the number of repeats for each hand at 4.

Weight Training

Weight training is one method by which an overload can be applied to a muscle or muscle group in order to improve muscular endurance and strength. The program provided here will exercise all the major muscle groups that will be used in the Physical Abilities Test. A 16-week training progression is given on the next page. The table prescribes the following:

Load: refers to the number of pounds of resistance lifted or moved.

Repetitions: refers to the number of consecutive times the exercise is done without interruption or rest, "reps."

Set: One set equals the number of repetitions performed for one exercise. If the prescription is for 3 sets, then 3 groups of "reps" are to be done in the exercise session. It would also be described as one round of all the different exercises, should the "reps" for an exercise not be done consecutively.

The weight training exercises that are prescribed for this program can be performed through the combined use of free weights and weight machines, or through the use of only a weight machine. Two exercises (Le., curl-ups and bench steps from the calisthenics program) that have body weight as the load instead of external weights are included in this training program to ensure that all relevant muscle groups are exercised. The recommended beginning or initial load (IL) is given at the end of each exercise description. If you cannot move the recommended load or cannot complete the 4 reps to start your program, reduce the recommended load by increments of 5 lbs. until you are able to complete 4 consecutive movements. Record the load.

If, on the other hand, the recommended initial load does not appear to stress you for the beginning 4 reps, then add increments of 5 lbs. until you feel that the load represents an overload for that muscle group. Another way of determining the initial load is to use the maximum load you can move once in a specific exercise. Use 80% of that maximum load as the initial load for that exercise. If you use the latter method to determine your initial load, it is extremely important that you have another person there to assist you. In fact, it is a good idea to have another person assist you in the determination of your initial load, or on the first day of training, regardless of the way you determine the initial load for each exercise.

The weight training exercises are presented in the order in which it is suggested they be performed. This program may be performed up to 3 times per week. Keep a log of the loads and number of repetitions, as appropriate. The suggested load increments are provided in the table on the next page.

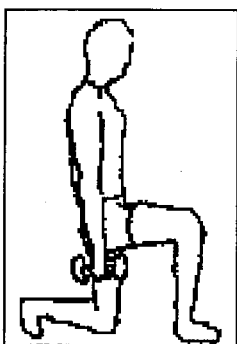
8.

WEIGHT TRAINING PROGRESSION

Week	Load	Reps	Sets
1	Initial Load (IL)	4	3
2	IL	5	3
3	IL	6	3
4	IL	7	3
5	IL	8	3
6	IL+5lb	4	3
7	IL+5lb	5	3
8	IL+5lb	6	3
9	IL+5lb	7	3
10	IL+5lb	8	3
11	IL+10lb	4	3
12	IL+10lb	5	3
13	IL+10lb	6	3
14	IL+10lb	7	3
15	IL+10lb	8	3
16	IL+10lb	9	3

Exercise Descriptions

These exercises are listed in the suggested order of performance. Be sure to complete a warm-up period prior to weight training.



1. Lunges and Traveling Lunges

For the leg muscles.

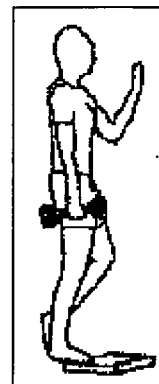
Stand with feet hip-width apart in a stride position. Hold dumbbells next to body or rest bar on your shoulders behind your neck with palms forward hands spread far apart on the bar. Lower the body directly between the feet by bending the knees to until hamstring touches calf or any discomfort or pain is felt as the flexion angle of the knee decreases. Maintaining the front leg heel down, torso perpendicular to ground and pushing through the ball of the foot, press back up to starting position. Perform the same number of lunges on the other side. Suggested initial load: 1/4 of body weight.

Variation: Hold dumbbells next to body or rest bar on your shoulders behind your neck with palms forward hands spread far apart on the bar. Step forward with right foot and lower the body weight to a lunge position. Lower the body directly between the feet by bending the knees to until hamstring touches calf or any discomfort or pain is felt as the flexion angle of the knee decreases. Maintaining the front leg heel down, torso perpendicular to ground and pushing through the ball of the foot back.

2. Toe Raises

For the muscles of the back of the lower leg.

Stand on a platform at least 4 inches high on right leg and hold a dumbbell in right hand. Balance yourself with the left hand. Keeping the right knee straight, raise upward on the ball of the right foot as high as possible then slowly lower the heel towards the floor. Do not stretch down as far as possible. Repeat on other side. Suggested initial load: 1/8 of body weight.



3. Side Leg Raises

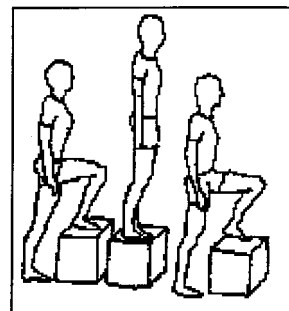
For the hip and thigh muscles.

Standing with your side to the pulley at a pulley station and holding it with one hand, hook the ankle of the outside leg to the pulley. With the knee slightly bent, move your leg to the side, as far as possible, and then return to the starting position. After completing a set, hook the ankle of the inside leg to the pulley. With the knee straight, move your leg in front of the other as far to the side as possible and complete a set. Turn around and repeat the exercises with the opposite legs. Suggested initial load: 1/4 of body weight.

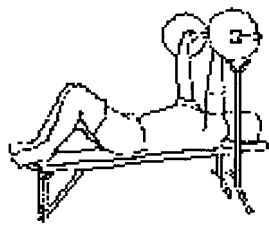
4. Bench Steps

For the leg muscles.

Step up onto a bench 8-12" high, bringing up both feet and then down again, one at a time, for 30 seconds (Up-up-down-down"). Increase the time for each lead foot by 10 seconds per week, up to a maximum of 60 seconds of stepping up and down with each lead foot.



5. Bench Press



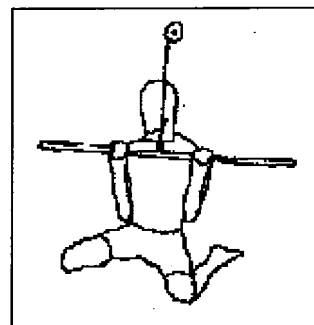
For the muscles in the shoulder, chest and arms.

Lie on your back on a bench with your feet on the bench. Hold the bar above the chest with an overhand grip, hands slightly wider than shoulder width, and elbows straight. Lower the bar to approximately 1 inch above the chest or touching the chest, maintaining upper arms at a 45 degree angle or less relative to your torso, and then return it to the starting position. Suggested initial load: 1/3 of body weight.

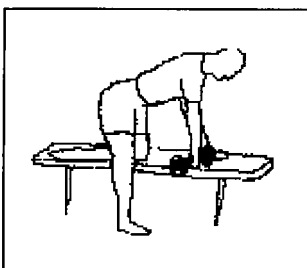
6. Lat Pull-downs

For the muscles of the upper and mid-back.

Grip the bar with either supinated grip, pronated grip, or neutral grip slightly wider than shoulder-width apart or wider. From a sitting position or kneeling position, with arms stretched overhead, lean your torso back slightly and pull the bar towards the chest. It is not necessary to touch the chest. Return to the starting position. Suggested initial load: 1/3 of body weight.



7. Bent Over Row



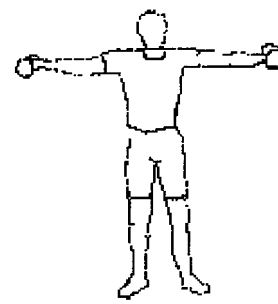
For the muscles of the upper and mid-back.

Stand next to bench with right hand and right knee on top of bench. Maintain flat back position with head neutral. Grasp dumbbell in left hand. Pull left elbow towards ceiling brushing left forearm by ribcage. Slowly return to starting position. Repeat on the other side. Suggested initial load: 1/3 of body weight.

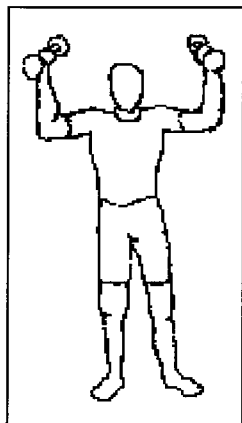
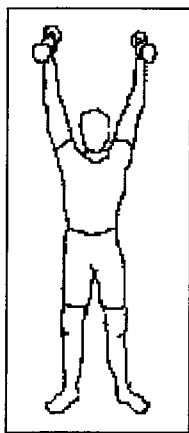
8. Lateral Raise

For shoulders.

Stand erect with feet shoulder width apart and knees slightly bent. Hold dumbbells slightly forward of thighs. Maintain a slight bend in the elbow as you raise the arms to shoulder level. Hands should remain in peripheral vision. Slowly return to starting position. Suggested initial load: 1/20 of body weight.



9. Overhead Press



For the muscles of the shoulders.

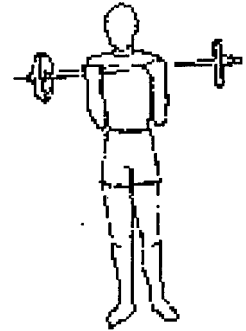
Sit or stand erect with feet shoulder-width apart in a slightly staggered position. Hold dumbbells with palms facing ears, hands positioned directly over the elbows. Push the dumbbells straight up to an overhead position until the arms are straight, trying to shrug the shoulders upwards to the ears, and then lower it in a controlled manner to the starting position. Do not arch your back. Suggested initial load: 1/4 of body weight

9.

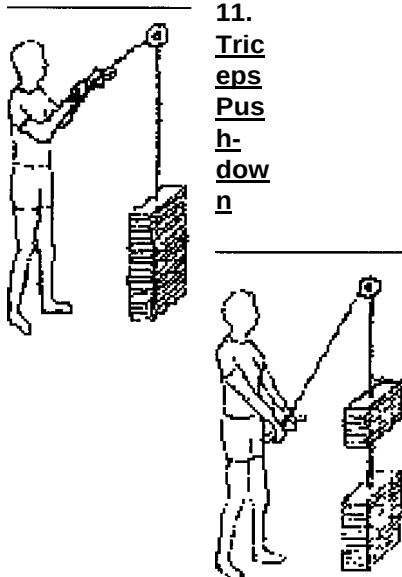
10. Arm Curls

For the muscles that bend the elbow.

Standing with the elbows straight and in front of the thighs, hold the bar with an underhand grip, hands shoulder-width apart. Keeping the elbows close to your sides, bend your elbows and raise the bar to your chest, then slowly lower the bar to the starting position. Do not lean backward while raising the bar or forward when lowering it. Suggested initial load: 1/4 of body weight.



10.



11. Triceps Pushdown

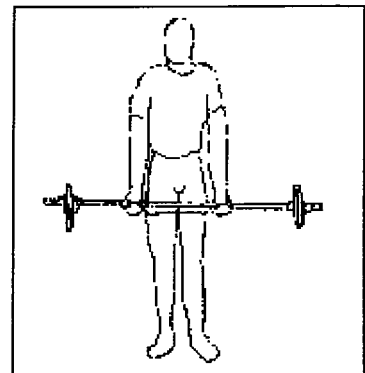
For the muscles that extend the elbow.

Attach bar to the top pulley at pulley station. Stand with feet shoulder-width apart one foot forward of the other and knees slightly bent. Grasp bar with palms forward and shoulder-width apart. Pull bar down so that the elbows are next to but not touching ribcage. Straighten your elbows pressing the bar down towards thighs and then return to the starting position. Suggested initial load: 1/3 of body weight.

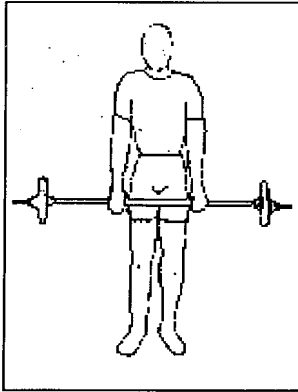
12. Wrist Curls

For the muscles that bend the wrist.

Standing with the elbows straight and in front of the thighs, hold the bar with an underhand grip, hands shoulder-width apart. Keeping the elbows close to your sides, curl your wrists to move the bar up, then slowly lower the bar to the starting position. Suggested initial load: 1/4 of body weight.



13. Reverse Wrist Curls

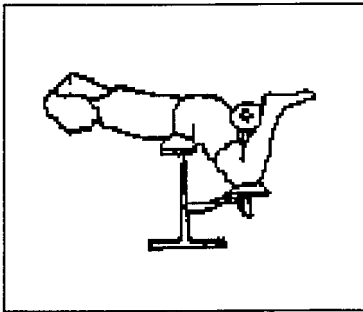


For the muscles that extend the wrist.

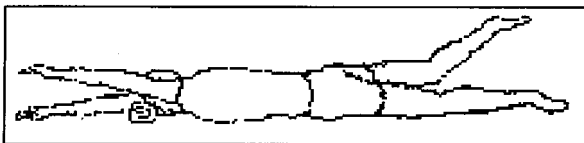
Standing with the elbows straight and in front of the thighs, hold the bar with an overhand grip, hands shoulder-width apart. Keeping the elbows close to your sides, extend your wrists to lift the bar up, then slowly lower the bar to the starting position. Suggested initial load: 1/4 of body weight.

14. Low Back or Hip Extensions

For the muscles in the back, buttocks and back of the legs. Lie on your abdomen, with the trunk unsupported over the edge of the low back extension machine. With the hands locked behind your head or crossed across your chest, slowly lift your trunk and head so that your back is parallel to the ground and then return to the starting position. Suggested initial load: 5 lifts. Increase the number of lifts by at least 1 per week, up to a maximum of 15.



15. Opposite Arm and Leg Lifts



For the muscles of back, buttocks and the back of the legs. Lie face down on the floor with forehead resting on a towel. Arms are stretched overhead with hands shoulder-width apart. Raise the left arm and the right leg approximately 4-8 inches from the floor. Lower to starting position. Repeat on other side. Increase by at least 1 per week, up to a maximum of 15 raises per side.

16. Curl – ups

For the abdominal region.

Lie face up on the floor with legs bent and heels approximately 8 - 12 inches from buttocks. Using abdominal muscles, tilt hips towards ribcage as you raise head and shoulders off of floor pressing lower back towards floor. Eyes stay focused over knees. Hands and arms may be supporting head, crossed over chest, sliding up legs or resting on floor. Increase by at least 2 per wee

