# MASSCHUSETTS STATE POLICE

# HEALTH AND FITNESS GUIDELINE

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## INTRODUCTION

Physical fitness preparedness will be paramount to your success in completing a training regimen at the Massachusetts State Police 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 Massachusetts State Police Academy, it is essential to participate in a proper fitness routine before entering the State Police 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 State 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 (See Appendix E). 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 Massachusetts State 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/her body in activities requiring strength, muscular endurance, cardio respiratory fitness, flexibility, coordination, agility, power, balance, speed and accuracy – without undue experience of fatigue or exhaustion.

## STRETCHING & FLEXIBILITY (Appendix D)

**Flexibility** is defined as: the range or extent of motion possible within a given joint. Applying the term flexibility to muscles means that if your muscles are very elastic and pliable, stretching easily, then maximum joint flexibility will be available to you.

There are three 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. **Proprioceptive neuromuscular facilitation stretching** is more complicated. 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 aerobic power. 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 stretching 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.

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

- Reduces 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
- Makes strenuous activities like running, cycling, and swimming easier

**FINDING YOUR TARGET HEART RATE**

1) Find Resting Heart Rate (RHR) first thing in the morning.
2) 220 – age = MHR.
3) MHR – RHR = HR Reserve.
4) HRR x %training zone = IL.
5) IL + RHR = 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% to 80% used for athletes.

## AEROBIC EXERCISE (Appendix A)

Aerobic exercise, also known as Cardiorespiratory 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 to:

- Decreased blood pressure
- Decreased body fat and tryglyceride 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
- Duration
- Intensity

**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 activities could include stair climbing, racquetball and circuit course type weight training.

**Frequency** refers to how often you participate in a type of exercise. Under ideal conditions, aerobic exercise two days a week will maintain a person's current fitness level. However, in order to improve your aerobic conditioning level, 3-5 days of aerobic exercise is usually needed.

**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 10 minutes of exercise duration, as long as the exercise is of an

aerobic mode and performed several times: Such as 3 to 4 times a day over a 5 day period.

**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 poor or very poor levels of fitness or people that are significantly overweight should calculate their training zone between 50-60% of their maximum heart rate (MHR). Individuals that are of average fitness levels 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.

| | |
|---|---|
| **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 (See Appendix B)**

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 maximum force in one contraction. (e.g. bench, 1 rep).
- Muscular endurance: This is the muscle's capacity to make repeated sub-maximal contractions without much fatigue. (e.g. pushups, reps).

The principles of muscular strength and endurance resistance training are:

- Overload - To increase strength or endurance, a higher workload than provided by daily activity must be imposed on the muscle.
- Progression - Successively higher 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.
- Balance - All muscles should be equally worked.
- Regularity - The muscle must work against resistance 2 to 3 times a week consistently.
- Recovery - The same muscle should not be worked to exhaustion on 2 consecutive days to allow for its recovery.

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 push with pull exercises
- Do multi-joint movements, such as bench press, before single joint movements, such as curls
- Work complimentary body segments during the same workout, such as chest and triceps, or back and biceps
- Seek trained professional advice

## OVER-TRAINING

Over-training involves placing an excessive amount of stress on the body 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 overtraining is doing too much too soon. 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 to an excessive degree, or engaging in an intensity level over your ability is neither wise, nor beneficial.

Some signs of overtraining 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 overtraining problems are:

- Never have two hard days in a row. A hard day would be one that places the body in the upper levels of your training zone (75-85% MHR or 1RM)
- Don't increase your intensity level by more then 10% a week
- Allow your body the time to adapt to your training routine
- Rest and maintain a regular sleep schedule

## 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 of methods is by using a device called a "body fat 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 and Bioelectric Impedance are also available. 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 estimated calculations and dependent on numerous factors. As a result, body fat percent should be used more for the purpose 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 more reliable 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 dramatically increases an individual's risk of developing one of the above health disorders.

To calculate your BMI use the following equation:

$$BMI = \frac{Weight_{lbs} \div 2.2}{[(Height_{inches}) \times (.0254)]^2}$$

| 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 viscerally or primarily around the waist is an 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 (Appendix C)**

Training logs are used to ensure improvement in cardiorespiratory (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 cardiorespiratory, strength and/or muscular endurance training.

## NUTRITION

### Hydration and fluid replacement:

Water is your most important nutrient. Although it contains no calories, water is essential for life. Water makes up 60% of your total body weight and 70% of your muscles. It serves as a transport mechanism for nutrients, gases, and waste products. It is also involved in the heat regulating functions of the body. Without water, your body cannot work at top levels and you may harm yourself. If you are not properly hydrated during a workout, you may encounter cramping and dehydration. Proper hydration is essential for top performance.

Thirst is an unreliable indicator to hydrate. If you feel thirsty, your body has already approached a level of dehydration. The feeling of thirst should be considered a warning indicating increased body heat and approaching heat illness. At the point of feeling thirsty, you should stop any physical activity and immediately replace body fluids, preferably with cool clear water.

**CARDIAC DRIFT & HYDRATION**

Despite the accuracy of electronic heart rate monitors, a phenomenon known as cardiac drift can throw a wrench into the works. Cardiac drift is the tendency of the heart to avoid a constant rate of functioning. As a result of cardiac drift the heart rate may rise slowly throughout your workout even if your pace remains constant. This increase can amount to as much as 20 beats per minute. Apparently, staying well hydrated can minimize the effects of cardiac drift.

Dr. Janet D'Arcy

The following guidelines help maintain proper hydration throughout your working day.

- Weigh in without clothes before and after exercise. For each pound of body weight lost during your workout, drink two cups of fluid.
- Drink 2.5 cups of water two hours before your workout.
- Drink at least one cup of water every 15-20 minutes during your workout.
- Do not restrict fluids before, during or after your exercise regimen.
- Avoid beverages containing caffeine and alcohol, because they increase urine production and add to dehydration.

### Nutrition - food choices - menu planning:

The American diet contains too much fat (particularly saturated fat), too much refined sugar and too many calories. History shows that general recommendations in proper nutrition can curb nutrition related diseases, including heart disease, stroke and obesity. More fruits, vegetables, and whole grains should be consumed, accompanying a decrease in refined sugars and flours, egg yolks and other foods high in fat and cholesterol. In addition, eating meats, fish and poultry that contain less fat and cholesterol is encouraged.

The six essential nutrients are: carbohydrates, proteins, fats, vitamins, minerals and water. The proper "athletic training" diet should include:

60% **Carbohydrates** @ 4 calories per gram
15% **Protein** @ 4 calories per gram
25% **Fat @** 9 calories per gram

*(Based on 2,000 calories per day.)*

Please note that caloric needs are based on age, sex and an individual's Basal Metabolic Rate.

Three key components to proper nutrition are variety, moderation, and nutrient dense food choices. Individuals should practice menu planning and avoid fast food meals of convenience. If you invest time in planning ahead for your day by packing a lunch or having fruits and vegetables on hand, you avoid the urge to grab the first thing that you see when you are hungry. Eating several small meals throughout the day instead of two or three large meals allows you to maintain constant energy levels and avoid the bogged down feeling so commonly experienced after ingesting large high fat and sugar dense meals.

Breakfast is the most important meal of the day and provides the jump-start your body needs to begin the day. Choices should include foods high in complex carbohydrates and fiber and low in fats and refined sugar. Increase fluid intake to hydrate the body and avoid everyday consumption of coffee or other caffeine containing beverages that tend to cause dehydration.

Supplement healthy snack choices for the traditional high fat and sugar containing ones. Better snack choices may include the following:

| Traditional | Healthy Alternative |
|---|---|
| Donut | Small bagels |
| Chips | Crackers |
| Pizza slice | Cheese (low fat) |
| Candy bar | Fig or Granola bars (low fat) |
| Soda | Water, Fruit or Sports drinks |
| Cookies | Graham crackers or Fresh fruit |
| **Other healthy alternatives:** | |
| yogurt (low fat) | breakfast bars |
| fresh vegetables | whole grain cereal |
| pretzels | |

**SUPPLEMENTS**

The consumption of performance-enhancing supplements, protein powders, amino acids, plant extracts, herbal supplements and other non-food substances is perhaps the trendiest area of sports nutrition. Athletes and laypersons believe that these supplements will give them a competitive edge when, in fact, they may be harmful to both health and performance.

The types of supplements used by athletes are continuously changing. There is a wide range of substances used. Substances are often marketed without any supportive scientific data to indicate the potential benefits or possible harmful side effects. Food and performance supplements are NOT regulated by the Federal Food and Drug Administration as many people believe. In fact, there is no independent or federally sanctioned agency that regulates the purity and safety of food supplements. Therefore, the Massachusetts State Police Academy does not recommend, endorse or encourage the use of any performance enhancing supplements.

**Drug use:**

The use of anabolic steroids and other performance-enhancing drugs such as testosterone, growth hormone, insulin and erythropoietin are not only very dangerous, but illegal. Any positive performance results from taking these drugs are usually short lived and are more than often accompanied by serious side effects and can even have fatal results.

Do not take any drug, in any form, which is not recommended or prescribed by a licensed medical practitioner. Be aware of people that offer you any substance that they claim will enhance your sports performance. Seek the advice of a physician or other licensed medical practitioner if you have questions.

**OVERUSE INJURIES**

Overuse/Inflammatory conditions may develop slowly and become chronic or may come and go before settling in. Signs and symptoms of overuse injury may include one or several of the following:

| | |
|---|---|
| Aching | Tingling |
| Pain | Cracking |
| Diminished Coordination | Tenderness |
| Decreased Joint Movement | Swelling |
| Decreased Strength | Numbness |

It is important to be aware of your body and what it is telling you. Continuing a training program while injured will not speed or increase your fitness results and could possibly lead to a long term disability.

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Physical training is intrinsically linked with injury prevention. We recognize that a lack of physical fitness is one of the primary causes of injury. Muscular imbalance, improper timing because of poor neuromuscular coordination, a lack of ligamentous, tendonous and muscle strength, lack of flexibility and inadequate muscle bulk are among the major causes of injury directly attributable to insufficient or improper physical conditioning.

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**PREVENTING OVERUSE INJURIES:**

The Six "**S**" Approach to analyzing the cause of overuse injuries from running:

**Shoes:** Footwear is a runner's most important piece of equipment**.** Footwear is designed to protect the bottom of the foot and provide flexibility and/or stability to the foot. Shock absorption and energy return are both key functions of footwear.

Go to a reputable shoe store with competent staff. Go to different stores and try on several pairs. Take your old shoes with you. They will tell an experienced sales person a lot about the way you wear your shoes. Take a pair of socks that you think you might wear with your shoes to get the proper fit. Remember that sneakers do not "break-in". For length, there should be a space the width of your thumbnail between the end of the toe box and the tip of your longest toe on your longest foot. Make sure you can freely wiggle your toes. The heel should feel snug, but comfortable. Get your feet measured every time you buy new shoes. Aging and injury can change your size.

Running shoes should be replaced every 300-400 miles if you run on hard surfaces and every 500 miles if you run on soft surfaces. Investing in the proper footwear can cost upwards of $75.00 – $90.00. Be cautious of purchasing bargain footwear. This footwear is often inferior in design and may not be appropriate for athletic training use.

**Surface:** Choose blacktop roads, without defects, whenever possible. If you run on a track be sure to change direction approximately every four laps. Run on even soft surfaces whenever possible to enhance shock absorption and to avoid injury.

**Speed:** Too many people try doing too much, too soon. Avoid increasing running mileage more than 10% a week. Use progression with speed and distance of training.

**Structure:** Your predisposed body composition. Address limitations and accommodate for leg length discrepancy, flat feet, bunions, etc.

**Strength:** Muscle balance over muscle imbalance. Stronger muscles provide more power for running up inclines. Equally important, they offer better shock absorption, hence injury protection when running downhill.

**Stretch:** Increased flexibility. If stretching is done properly, it prepares the muscle for imposed demands and reduces injury.

**Reducing pain and injury:**

Immediate care of overuse injuries is kept simple by using the **R.I.C.E.** principle. **R.I.C.E.** is an acronym for **R**est, **I**ce, **C**ompression and **E**levation.

These techniques reduce further trauma to the injured area, decrease blood flow and keeps swelling of effected area to a minimum.

**NSAIDs (non-steroidal anti-inflammatory drugs) such as Advil, Motrin or Acetaminophen may also aid in reducing signs and symptoms.*

** It is recommended that you obtain the advice of a physician before taking any type of medication.*

Please remember: this information is not intended as a substitute for medical treatment. Consult a physician or health care professional if the injury does not resolve.

**CLOSING**

Understanding the personal benefits and barriers of exercise and developing the skills and resources for regular physical activity are important in maintaining a planned approach to exercise. What motivates one person to become and remain physically active will differ from another. **The Health & Fitness staff at the Massachusetts State Police Academy wants you to succeed.** It is hoped that by providing you with the previous information you will have the basics to initiate or modify your current physical fitness training program. The physical challenges you will encounter at the State Police Academy are great. The more you prepare yourself for this challenge, the greater chance you will have to successfully complete the recruit training program at the Massachusetts State Police Academy.

On behalf of the Health and Fitness staff, we wish you the best of health and fitness.

**DISCLAIMER**

This preparation 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 intended to render 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.

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# APPENDIX A

## Cardiovascular Prescription

Recommended Cardiovascular Training Program Using Heart Rate.

| Factor | Low Fitness level<br>Very Poor & Poor | Average Fitness Level<br>Fair & Good | High Fitness Level<br>Excellent & Superior |
|---|---|---|---|
| Frequency (Days/Week) | 3 | 3 or 4 | 5 |
| Duration (Minutes at THR) | 10-30 | 15-45 | 30-60 |
| Intensity (% HR Reserve) | 50-60 | 60-70 | 70-85 |
| Mode* (Type of Exercise) | Walk, Swim, Cycle | Walk, Jog, Run, Swim, Cycle | Jog, Run, Swim, Cycle |

* Other activities such as cross country skiing, roller-blading, rowing and stair climbing may also be used.

Over a sixteen (16) week period, gradual increases in duration and intensity should be made. Increases should take place only after completion of a full week or two of continuous training. No more than a 10% increase is recommended at a time. Remember that aerobic benefits are measured by monitoring heart rates and not necessarily duration and intensity alone. Even though you may increase duration, frequency and intensity, your "target heart rate" should always stay in your designated training zone during your training.

# APPENDIX B

## Weight Training Exercises

| MUSCLE GROUPS | NO WEIGHTS | FREE WEIGHTS | RESISTANCE MACHINES |
|---|---|---|---|
| BACK (UPPER) Lattissimus Dorsi | Pull-up | Dumbbell row | Lat pull-down |
| LEGS (TOP FRONT) | Squats | Squat | Leg extension |
| CHEST Pectoralis | Push-ups | Bench press | Seated chest press |
| LEGS (TOP BACK) Hamstrings | Lunge | Lunges | Leg curl |
| SHOULDERS Deltoids | Dip | Seated press | Shoulder press |
| WAIST-STOMACH Abdominal | Crunches | Crunches w/weights | Ab machine |
| ARMS (UPPER FRONT) Biceps | Chin-up | Bicep curl | Curl machine |
| CALVES Gastrocnemius | Heel raise | Heel raise w/weights | Calf raise machine |
| ARMS (UPPER BACK) Triceps | Dips | Tricep extension | Tricep press-down |

## Sample resistance training program

| EXERCISE | REPS / SETS | DAYS | MUSCLE GROUP |
|---|---|---|---|
| 1. Leg Extension | 8-12 / 2-3 | MWF | Lower Leg (thigh) |
| 2. Leg Curl | 8-12 / 2-3 | MWF | Lower Leg (hamstring) |
| 3. Calf / Toe Raise | 8-12 / 2-3 | MWF | Lower Leg (calf) |
| 4. Pullover / Bent Rows | 8-12 / 2-3 | MWF | Back |
| 5. Bench Press | 8-12 / 2-3 | MWF | Chest |
| 6. Dumbbell Overhead Press | 8-12 / 2-3 | MWF | Upper Back / Shoulders |
| 7. Shoulder Shrugs | 8-12 / 2-3 | MWF | Shoulders |
| 8. Triceps Extension | 8-12 / 2-3 | MWF | Upper Arm (back) |
| 9. Biceps Curl | 8-12 / 2-3 | MWF | Upper Arm (front) |
| 10. Wrist Curls | 8-12 / 2-3 | MWF | Lower Arm (forearms) |
| 11. Ab Crunch (50% max) | 3 sets | MWF | Abdominal / Stomach |
| | | | |
| 1. Push Ups (50% max) | 3 sets | T / Th | Back / Chest / Arm |
| 2. Pull Ups (50% max | 3 sets | T / Th | Back / Arms |
| 3. Abdominal Crunch (50% max) | 3 sets | T / Th | Abdominal / Stomach |

***NOTE**: 50% max refers to the maximum amount of repetitions you can perform in one minute.

Remember goal-setting guidelines for both dynamic and absolute strength is about eight (8) weeks in order to see a significant one-category change. A category change is a 10% increase in either maximum repetitions or your maximum amount of weight you can lift in one repetition. Over a 16 week period a two-category increase is expected.

# APPENDIX C
# CARDIOVASCULAR TRAINING LOG

| Wk. | Date: Exercise Info | Mon. / / | Tues. / / | Wed. / / | Thur. / / | Fri. / / | Sat. / / | Sun. / / |
|---|---|---|---|---|---|---|---|---|
| ____ | Activity | | | | | | | |
| | Duration | | | | | | | |
| | Level/Dist. | | | | | | | |
| | Exer. HR | | | | | | | |
| | Weight | | | | | | | |
| ____ | Activity | | | | | | | |
| | Duration | | | | | | | |
| | Level/Dist. | | | | | | | |
| | Exer. HR | | | | | | | |
| | Weight | | | | | | | |
| ____ | Activity | | | | | | | |
| | Duration | | | | | | | |
| | Level/Dist. | | | | | | | |
| | Exer. HR | | | | | | | |
| | Weight | | | | | | | |
| ____ | Activity | | | | | | | |
| | Duration | | | | | | | |
| | Level/Dist. | | | | | | | |
| | Exer. HR | | | | | | | |
| | Weight | | | | | | | |
| ____ | Activity | | | | | | | |
| | Duration | | | | | | | |
| | Level/Dist. | | | | | | | |
| | Exer. HR | | | | | | | |
| | Weight | | | | | | | |

*** Refer to Appendix A for recommended modes of exercise.**

**Name (print): _____**

**Signature: _____**

**Date: _____**

## APPENDIX C continued
## STRENGTH TRAINING LOG

| Wk. | **Exercise** | **Date** | Mon. / / | Tues. / / | Wed. / / | Thur. / / | Fri. / / | Sat. / / | Sun. / / |
|---|---|---|---|---|---|---|---|---|---|
| ____ | | Weight | | | | | | | |
| | | Sets | | | | | | | |
| | | Reps | | | | | | | |
| ____ | | Weight | | | | | | | |
| | | Sets | | | | | | | |
| | | Reps | | | | | | | |
| ____ | | Weight | | | | | | | |
| | | Sets | | | | | | | |
| | | Reps | | | | | | | |
| ____ | | Weight | | | | | | | |
| | | Sets | | | | | | | |
| | | Reps | | | | | | | |
| ____ | | Weight | | | | | | | |
| | | Sets | | | | | | | |
| | | Reps | | | | | | | |
| ____ | | Weight | | | | | | | |
| | | Sets | | | | | | | |
| | | Reps | | | | | | | |
| ____ | | Weight | | | | | | | |
| | | Sets | | | | | | | |
| | | Reps | | | | | | | |
| ____ | | Weight | | | | | | | |
| | | Sets | | | | | | | |
| | | Reps | | | | | | | |
| ____ | | Weight | | | | | | | |
| | | Sets | | | | | | | |
| | | Reps | | | | | | | |
| ____ | | Weight | | | | | | | |
| | | Sets | | | | | | | |
| | | Reps | | | | | | | |

*** Refer to Appendix B for recommended modes of exercise.**

**Name (print): _____**

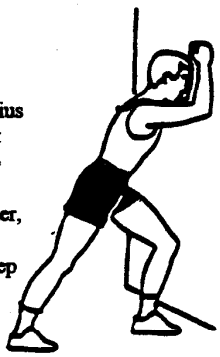
**Signature: _____**

**Date: _____**

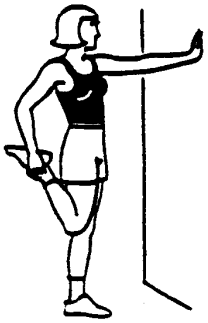
# APPENDIX D

## The Basic stretching session

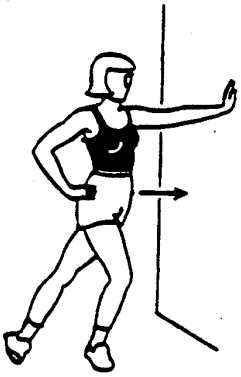
1. NECK STRETCH. Tilt head to right, keeping shoulders down. Place right hand on left side of head. Gently pull head toward right shoulder for 10 to 30 seconds. Switch sides and repeat.



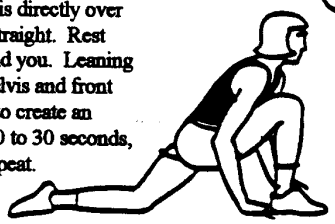
2. CALF STRETCH (for gastrocnemius and soleus musces). Stand 2 to 3 feet froma wall, with feet perpendicular to wall and lean against it for 10 to 30 seconds. Keep feet parallel to each other, make sure rear heel stays on floor. Switch legs and repeat. Variation: keep rear knee slightly bent during stretch.



3. THIGH STRETCH (for quadroceps). Placing left hand against wall for balance, grab right ankle with right hand and pull heel gently toward buttocks for 10 to 30 seconds. Do not arch back. Switch sides and repeat.



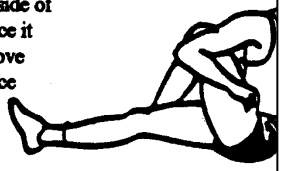
4. OUTER THIGH STRETCH (for inoubial band). Placing left hand against wall for balance, place left foot behind and beyond right foot. Bend left ankle and lean into wall. Hold for 10 to 30 seconds, then switch and repeat.

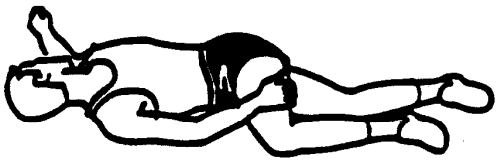


5. HIP STRETCH (for hip flexor). From a kneeling position, bring right foot forward until knee is directly over ankle; keep right foot straight. Rest left knee on floor behind you. Leaning into front knee,lower pelvis and front of left hip toward floor to create an easy stretch. Hold for 10 to 30 seconds, then switch legs and repeat.

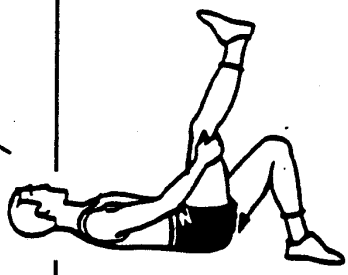
6. BUTTERFLY STRETCH (for adductor muscles in groin). Sit on floor, bringing heels together neear groin and holding feet together. Have a partner gently push your legs down; hold for 5 seconds. Try to bring your knees upward as partner provides resistance. Relax, then have partner gently push down again for a greater stretch. Repeat. You can do the first part without a partner, simpy by lowering your knees as far as possible.

7. SPINAL TWIST 9for back and sides). Sit with right leg straight out, and left knee bent, with left foot placed on the outside of right knee. Bend right elbow and place it on outside of upper left thigh, just above knee, to kieep that leg stationary. Place left hand behind you, slowly turn head to look over left shouldeer, and twist upper body toward left arm. Hold for 10 to 30 seconds. Switch sides and repeat.

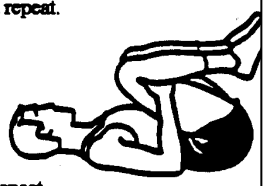




8. CROSSOVER STRETCH (for lower back). Lying on back, bend left knee at 90° and stretch arms out to sides. Place right hand on left thigh and pull that bent knee over right leg. Keeping head on floor, turn to look toward outstretched left arm. Pull bent left nee toward floor, keep shoulders flat on floor. Hold for 10 to 30 seconds, then switch sides and repeat.



9. THIGH STRETCH (for hamstrings). Lie on back with both knees bent. Grasp behind the right thigh with both hands and pull toward chest. Slowly straighten leg, keeping foot relaxed. Hold for 10 to 30 seconds, then lower leg, switch legs, and repeat.



10. LUMBAR STRETCH (for lower back). Lying on back, clasp one hand under each knee. Gently pull both knees toward chest, keeping lower back on floor. Hold for 10 to 30 seconds, relax, then repeat.

## APPENDIX E

## MASSACHUSETTS STATE POLICE ACADEMY
## APPENDIX F

## SAMPLE PHYSICAL TRAINING SCHEDULE

# Physical Training Protocol
# Week Four

| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| 0700-0715 | Warm Up & Stretch | Warm Up & Stretch | Warm Up & Stretch | Warm Up & Stretch | Warm Up & Stretch |
| 0715-0815- | **Class Run - 3 Miles**<br>**Upper body Calisthenics** | **Class Run - 3 Miles**<br>Lower Body **Calisthenics** | **Defensive Tactics Circuit** | **Calisthenics Circuit**<br>**Class Run** | **Class Run and Sprints**<br>**Calisthenics** |
| 0815-0830 | Cool Down & Stretch | Cool Down & Stretch | Cool Down & Stretch | Cool Down & Stretch | Cool Down & Stretch |

- Weather will be a determining factor on outside activity. Safety will be paramount in all physical fitness training.
- Staff members will ensure recruits are properly hydrating at all times.
- Any recruit sustaining an injury will report immediately to the Medical staff.
- Week Four P.T. plan will consist primarily of continuation of the Cardiovascular Endurance building phase (2-4 mile runs in class formation).
- The runs will be led by a member of the Health and Fitness staff.