

# Recruit Officer Course



Commonwealth of Massachusetts  
Municipal Police Training Committee

## Health & Wellness Preparation Guide

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The Municipal Police Training Committee (MPTC), an agency of the Executive Office of Public Safety and Security (EOPSS), serves the Commonwealth by establishing training standards, oversight and policy guidance for policing professionals.

### I. Introduction

**Note:** This “Preparation Guide” must be issued to each student officer candidate as required reading. It is also a supplement to the Volume I: [Officer Wellness](#) lesson.

The definition of 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.”*

To graduate from the academy, student officers must demonstrate the ability to *“meet above average physical stresses encountered in emergency situations,”* especially those relevant to law enforcement as measured by participation in physical training activities and by successful completion of all skills training and practical exercises.

The academy health and wellness training program has three primary objectives.

- A. Provide student officers with needed levels of strength and endurance to participate in specific academy training programs.
- B. Ensure student officers graduate with needed levels of strength and endurance to perform essential police officer job tasks.
- C. Promote lifestyle habits to enhance the student officer’s long-term health throughout his or her law enforcement career.

However, the ultimate goal is to provide the Commonwealth’s citizens with police officers who are more efficient, effective and less likely to be injured on the job and who are better prepared for providing service and protection to their communities.

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### II. Entry Level Fitness Assessment

Fitness assessment tests are administered at the beginning, middle and end of every academy (Phases 1, 2 & 3). This section contains general instructions for completing common academy fitness assessment events.

#### A. Preparation

To ensure optimal performance, student officers should do the following when preparing for a fitness assessment test:

1. Get at least 8 hours of uninterrupted sleep the night before.
2. Do not drink caffeine or use tobacco products 3 hours prior to test.
3. Do not eat a large meal or foods high in sugar or fat 3 hours prior to test.
4. Wear clothes that are comfortable, flexible, and appropriate for weather conditions.
5. Between events, drink enough water to remain hydrated.
6. Between events, keep muscles warm by walking, stretching, and moving.

#### B. Push-Ups

A push-up test is used to measure upper body muscular endurance, specifically the anterior deltoid, pectoralis major, and triceps. The test counts the number of correct push-ups completed in 1-minute.

1. For *full-body* push-ups, lie face down on the ground with hands slightly wider than shoulder width apart, and fingers pointed forward and feet together. Feet cannot be braced against a wall. The body must form a straight line from ankles through the knees, hips, back and shoulders to the head.

Begin *full-body* push-up test in the up planked position where the body forms a straight line from the head to the ankles. Head must

be in a neutral position with feet together.

Taker must keep back straight at all times and lower the body to the floor until chest is approximately 3" from the floor, then return to the up position. This is 1 repetition. A test administrator or partner will place his or her fist under the taker's chest in the middle of the sternum to verify down position was achieved.

2. The *modified* push-up is performed on the hands and knees with the back straight and hands slightly in front of the shoulders in the up position.

Begin *modified* push-up test in the up position. Head must be in a neutral position with feet together. Taker must keep back straight at all times and lower upper body to the floor until chest is approximately 3" from the floor, then return to the up position. This is 1 repetition. A test administrator or partner will place a fist under taker's chest in the middle of the sternum to verify down position was achieved. For female takers, a 3-inch-high sponge will be used in lieu of fist when a male is administering / counting.

3. Resting for *full-body* and *modified* push-ups must be done in the up position. Both hands must remain in contact with the floor at all times. No piking or arching is allowed at any time; the back must be kept straight.
4. Breathing during the test should remain as normal as possible by exhaling when pushing up and inhaling when going down. Do not hold your breath at any time during the test.
5. If at any time the form described above is broken by raising or piking the buttocks, sagging the body's midsection, arching the back, lifting a hand or foot, not going all the way down or up, lifting the neck or any other item outside of proper form, then the incorrect push-up(s) will not be counted. If the continual incorrect form is deemed unsafe, terminate the test

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6. The total number of correct push-ups in 1-minute is recorded as the score. The table below lists the minimum push-up standards for each phase of basic training.

PHASE	AGE	MEN	WOMEN (modified)
<b>1</b> Entry	<b>20-29</b>	<b>26</b>	<b>13 (20)</b>
	<b>30-39</b>	<b>20</b>	<b>9 (15)</b>
	<b>40-49</b>	<b>15</b>	<b>7 (10)</b>
	<b>50-59</b>	<b>10</b>	<b>NA (9)</b>
	<b>60+</b>	<b>8</b>	<b>NA (3)</b>
<b>2</b>	<b>20-29</b>	<b>29</b>	<b>15 (23)</b>
	<b>30-39</b>	<b>24</b>	<b>11 (19)</b>
	<b>40-49</b>	<b>18</b>	<b>9 (13)</b>
	<b>50-59</b>	<b>13</b>	<b>NA (12)</b>
	<b>60+</b>	<b>10</b>	<b>NA (5)</b>
<b>3</b>	<b>20-29</b>	<b>29</b>	<b>15 (23)</b>
	<b>30-39</b>	<b>24</b>	<b>11 (19)</b>
	<b>40-49</b>	<b>18</b>	<b>9 (13)</b>
	<b>50-59</b>	<b>13</b>	<b>NA (12)</b>
	<b>60+</b>	<b>10</b>	<b>NA (5)</b>

### C. Prone Plank

A prone plank test is used to measure core strength and endurance. The test will be graded by completing the appropriate plank form (see below) for the given time limit (30 seconds for entry evaluation/1-minute for Phase 2 Academy evaluation).

1. To start the test, test administrator will give the command "GET READY". Hands must be on the ground. Hands can either be in fists with the pinky side of the hand touching the ground or lying flat with palms down, no more than shoulder width apart. Elbows must be bent and in contact with the ground, shoulders must be directly over the elbows, and forearms flat on the ground. One or both knees resting on the ground before the start of the event.
2. Once proper set-up is achieved, the test administrator will give the

command "GET SET, GO". The candidate/recruit will lift both of their knees off the ground and position the body into a straight line from the shoulders, to the hips, to the knees, to the ankles. The feet may be hip-width apart or together.

3. Shaking or trembling due to maximum exertion is permitted as long as the proper plank position described above is maintained.
4. A plank will not count if:
  1. The body position during the plank is not in a straight line from the shoulders, through the hips, to the knees, and ankles.
  2. The feet, forearms, or hands lose contact with the floor or fingers interlace.
  3. If you rest on the ground, your plank event will be terminated.
5. The test administrator will inform candidates/potential recruits when they achieve the 15 seconds mark and the 30 second completion time during the entry level evaluation. During the Phase 2 Academy evaluation, test administrators will inform recruits when they achieve the 15 second, 30 seconds, 45 second, and 60 second completion mark.
6. Scores will be recorded by test administrators.

### D. 1.5 Mile Run

The 1.5 mile run measures aerobic endurance, which is the ability to perform at a continuous effort for extended durations.

1. Prior to the test, warm-up for at least 5 minutes per normal training regimen.
2. Begin test at the start line and run as fast as possible until the 1.5-mile finish line is crossed (or total number of laps are completed).
3. A test administrator or partner will record taker's time in minutes and seconds using a stopwatch.

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4. After finishing the 1.5-mile run, cool down for 3-5 minutes by walking or continuously moving.
5. If distress is felt at any time during the test, do not continue.
6. The table below lists the minimum 1.5 mile run times for each phase of training.

PHASE	AGE	MEN	WOMEN
1 Entry	20-29	13:16	15:52
	30-39	13:46	16:38
	40-49	14:34	17:22
	50-59	15:58	18:59
	60+	17:38	21:20
2	20-29	12:38	14:50
	30-39	13:04	15:38
	40-49	13:49	16:21
	50-59	15:03	18:07
	60+	16:46	20:06
3	20-29	12:38	14:50
	30-39	13:04	15:38
	40-49	13:49	16:21
	50-59	15:03	18:07
	60+	16:46	20:06

### E. 300-Meter Run

The 300-meter run measures aerobic power, which is the ability to perform at a maximum effort for limited duration.

1. Prior to the test, warm-up for at least 5-minutes per normal training regimen.
2. Begin test at designated start line and run as fast as possible until the 300-meter finish line is crossed.

3. Pacing devices, external assistance, or instruments that impair takers from hearing instructions are prohibited during test.
4. A test administrator or partner will record taker's time in minutes and seconds using a stopwatch.
5. After finishing the 300-meter run, cool down for 3-5 minutes by walking or continuously moving.
6. If distress is felt at any time during the test, do not continue.
7. The table below lists the minimum 300-meter run times for each phase of training.

PHASE	AGE	MEN	WOMEN
<b>1 Entry</b>	<b>20-29</b>	<b>1:02.1</b>	<b>1:15</b>
	<b>30-39</b>	<b>1:03</b>	<b>1:22</b>
	<b>40-49</b>	<b>1:17</b>	<b>1:46.7</b>
	<b>50-59</b>	<b>1:27</b>	<b>NA</b>
	<b>60+</b>	<b>NA</b>	<b>NA</b>
<b>2</b>	<b>20-29</b>	<b>0:59</b>	<b>1:11</b>
	<b>30-39</b>	<b>0:58.9</b>	<b>1:19</b>
	<b>40-49</b>	<b>1:12</b>	<b>1:34</b>
	<b>50-59</b>	<b>1:23.2</b>	<b>NA</b>
	<b>60+</b>	<b>NA</b>	<b>NA</b>
<b>3</b>	<b>20-29</b>	<b>0:59</b>	<b>1:11</b>
	<b>30-39</b>	<b>0:58.9</b>	<b>1:19</b>
	<b>40-49</b>	<b>1:12</b>	<b>1:34</b>
	<b>50-59</b>	<b>1:23.2</b>	<b>NA</b>
	<b>60+</b>	<b>NA</b>	<b>NA</b>

### III. Physical Training Participation

Every student officer must participate in scheduled assessments and physical training (PT) sessions. If a student officer fails the phase 2 fitness assessment and re-test after two weeks, they will be dismissed from the academy. During the re-test, the student officer must only pass the specific event they failed.

### IV. Injury Notification

Student officers must immediately report any injury to their physical training instructor. For any day a student officer cannot fully participate in the scheduled PT sessions due to a minor injury, they will be allowed alternate exercises that will not put stress on the student officer's injury. If the student officer's injury is significant or lasts longer than two days, or they cannot perform the activity safely, they must schedule an appointment with their physician.

Procedure for return-to-training medical releases following a student officer injury.

- The student officer who sustains an injury that requires treatment by a physician shall obtain a medical release before they are authorized to resume training.

All student officer injuries must be documented on an injury/illness form to include date and reason. The injury/illness form must be signed by the student officer and forwarded to the Academy Director for review. In addition, the student officer must prepare a To/From memorandum describing how the injury occurred.

Student officers who disagree with the injury designation may appeal to the Academy Director in writing within 24 hours.

The Academy Director will inform the department representative about the student officer's status regarding any injury/illness.

Examples of injury/illness designation include, but are not limited to the following:

- Missing any portion of a scheduled assessment or PT session due to an injury or illness.
- Student officer is assigned to alternate exercise due to illness or injury.

## V. Preparing for the Academy

**Disclaimer:** This “Guide” provides general information to help student officers prepare for academy physical fitness training. Consult with a health care professional before beginning any physical exercise program.

A lack of preparation is one reason why student officers do not successfully complete the academy’s health and wellness program and ultimately graduate.

### A. Physical Activity Readiness Questionnaire (PAR-Q)

Effective fitness programs are safe and meet individual needs. The PAR-Q is a basic health screening questionnaire used to identify risk factors that may need medical clearance prior to participating in an exercise program.

Consult with a health care professional if you answer YES to any question below and before beginning any exercise program.

PAR-Q Questions	Yes
1. Have you ever had chest pains or difficulty breathing during or after exercise?	
2. Do you have hypertension (high blood pressure)?	
3. Do you have an illness or condition that is aggravated by exercise/activity?	
4. Do you have now, or ever had any difficulty with physical exercise?	
5. Have you ever had surgery? If yes, for what?	
6. Have you given birth in the last 3 months? Could you be pregnant now?	
7. Do you have seasonal allergies or asthma?	
8. Do you have existing injuries that may be aggravated by physical activity?	
9. Do you have now or ever had Diabetes or a Thyroid condition?	
10. Did you ever or do you now smoke cigarettes?	
11. Were you ever or are you now considered overweight?	
12. Do you have now or ever had increased blood cholesterol?	
13. Do you have now or ever had a Hernia?	
14. Do you have any physical pain or discomfort now? If yes, where?	

15. Are you on any medications (Rx or over-the-counter).	
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**Note:** Prior to the academy, every student officer must be examined by a licensed physician. Copies of all regulations and required forms are available at: [www.mass.gov/civilservice](http://www.mass.gov/civilservice).

Signs, symptoms, risk factors, and known conditions outlined below may prevent physical exercise. When unsure, consult with a health care professional before beginning any exercise program.

### 1. Signs or Symptoms

The following signs and symptoms may indicate heart, lung or metabolic disease.

- a) Ankle swelling
- b) Consistent leg pain
- c) Difficult or painful breathing
- d) Heart palpitations
- e) Shortness of breath with mild exertion
- f) Discomfort, or numbness in chest, arm, jaw, neck, or back
- g) Systolic blood pressure  $\geq 160$  mmHg or diastolic blood pressure  $\geq 90$  mmHg (measured on two separate occasions)
- h) Serum cholesterol  $\geq 240$  mg/dl
- i) Family history (parents, siblings) of heart disease or stroke prior to age 55

### 2. Diabetes

Exercise risks can increase for diabetics who (a) take insulin; (b) have had diabetes for more than 15 years; or (c) do not take insulin, but are over 35 years old.

### 3. Age

Exercise risks can increase for men over 40-years old and women over 50-years old.

### 4. Smoking

In addition to being a risk factor for heart disease, smoking impacts ability to perform critical police job tasks. To maximize potential, student officer applicants who smoke are urged to quit as soon as possible.

**By law, municipal or MBTA police officers must be non-smokers.**

### 5. Other habits and conditions

Other habits and health conditions that may increase risk during exercise include, but are not limited to the following:

- a) Obesity
- b) Pulmonary disorder (e.g., asthma)
- c) Drug or alcohol use
- d) Pregnancy

### B. Stretching

*Flexibility* is a key component of fitness training and defined as *the range of possible motion within a given joint*. Flexibility also applies to the range of motion for muscles and soft tissue surrounding a joint.

In general, the more flexible a joint or muscle, the less likely it will sustain injury during physical exertion.

### 1. Benefits of stretching

Stretching helps improve flexibility by elongating muscles and soft tissue around a joint. Benefits of stretching include the following:

- a) Reduces injury (e.g., lower back, muscle tears, sprains)
- b) Increases muscular strength
- c) Promotes muscle relaxation
- d) Improves circulation
- e) Improves job performance
- f) Improves body awareness
- g) reduces muscle soreness after exercise

### 2. Types of stretches

- a) *Dynamic stretches* are full motion movements of large muscle groups. Examples of dynamic stretches include, but are not limited to jumping jacks, arm circles, and torso rotations.
- b) *Static stretches* are gradual and move through a joint's full range of motion. Static stretches are held at the point where mild resistance is felt.

### 3. Best practices for stretching

- a) Use slow, smooth and controlled movements.
- b) Do not bounce.
- c) Stop the stretch at the first sign of pain.
- d) Begin exercise routine with low intensity *dynamic* and *static* stretches for 5-10 minutes.

- e) End exercise routine with 10-15 minutes of *static* stretching.
- f) Hold stretches for 10-60 seconds at the point of mild resistance.
- g) Relax and do not hold your breath when stretching.
- h) Do not stretch in the following circumstances:
  - Within 24-72 hours of muscle or ligament trauma
  - When joints or muscles are infected or inflamed
  - After a recent bone fracture
  - When sharp pain is felt in the joint or muscle
  - If osteoporosis exists or is suspected

#### 4. Stretching programs at the academy

Each academy PT session will begin and end with stretching to increase flexibility, reduce risk of injury, and enhance performance.

### C. Aerobic Exercise

Aerobic (i.e., cardiovascular) exercise uses large amounts of oxygen and large muscle groups in a continuous and rhythmic manner for a sustained period of time. Common aerobic activities include, but are not limited to walking, running, swimming, and cross-country skiing.

#### 1. Benefits of aerobic exercise

- a) Decreases blood pressure
- b) Decreases body fat
- c) Reduces risk of heart disease
- d) Increases bone density
- e) Improves job performance

#### 2. Best practices for aerobic exercise

a) Use **F**requency, **I**ntensity & **T**ime (F.I.T.)

- (1) Frequency is the number of aerobic activities per week. In general, 3-5 days of aerobic exercise is needed to improve cardio levels.
- (2) Intensity refers to exercise difficulty. Aerobic intensity is determined by individual health and fitness levels. For example, walking may be vigorous for someone who is overweight or unaccustomed to physical activity. For aerobic exercise, a “moderate” intensity is more effective and enjoyable.

Calculating aerobic intensity can be done using talk test, perceived exertion, or training heart rate.

(a) Talk Test

During aerobic exercise, you should be able to comfortably talk or carry on a conversation.

(b) Perceived Exertion

Use a sliding number scale to determine intensity according to individual perception.

Rate	Perceived Exertion
1	None (sitting)
2-3	Light (e.g. walking)
4-5	Moderate (e.g. light jog)
6-7	High (e.g., timed run)
8-9	Vigorous (e.g., sprinting)
10	Unsustainable

(c) Training Heart Rate (THR)

Training heart rates (THR) are an effective way

to calculate and monitor aerobic intensity.

Follows steps 1-2 below to calculate a THR.

**STEP 1:**  $220 - [\text{age}] = Y$

**STEP 2:**  $Y \times .60 = \text{Light intensity THR}$   
 $Y \times .70 = \text{Moderate Intensity THR}$   
 $Y \times .80 = \text{High Intensity THR}$

For example, Kate is 26 years old.

**STEP 1:**  $220 - 26 = 194$

**STEP 2:**  $194 \times .60 = 116$  (light THR)  
 $194 \times .70 = 135$  (moderate THR)  
 $194 \times .80 = 155$  (high THR)

**Note:** Heart Rate Monitors and fitness bands offer an effective way to monitor and maintain THR during exercise.

To receive the maximum benefits from aerobic exercise, maintain THR for entire activity duration.

- (3) Time refers to aerobic exercise duration. Exercise time will depend on individual conditioning and goals.

To improve aerobic fitness levels, maintain a consistent THR for at least 30 minutes during the main activity.

To lose weight, reduce intensity and increase main activity duration to 45-60 minutes.

- b) Gradually increase frequency, intensity or time.

- c) Use a variety of aerobic activities. The key is to find aerobic activities that are enjoyable.
- d) Include *dynamic* and *static* stretches to warm-up and cool-down before and after aerobic exercise.

### 3. Aerobic exercise at the academy

Endurance runs begin at 1.5 miles and increase incrementally to more than 5 miles. Endurance runs become progressively more challenging in pace and distance throughout the academy.

## D. Resistance Training

Resistance or weight training is used to improve muscular strength and muscular endurance.

Muscular strength: Maximum force muscles can exert in a single effort. For example, the maximum weight you can bench press once.

Muscular endurance: Maximum ability to sustain, or repeat muscular activity, over time. For example, the maximum number of push-ups you can do in 1 minute.

### 1. Benefits of resistance training

- a) Decreases body fat
- b) Increases bone density
- c) Improves job performance

### 2. Definitions

- a) Load is the weight or number of pounds lifted.
- b) Repetitions are the number of consecutive times an exercise is done without interruption or rest (i.e., “reps”).

- c) Set is one group of consecutive *repetitions* performed for one exercise. For example, a resistance training program may use 3 sets of 10 reps for one exercise.

### 3. Best practices for resistance training

Common resistance training activities include, but are not limited to calisthenics and lifting weights.

#### a) Use **F**requency, **I**ntensity & **T**ime (F.I.T.)

- (1) Frequency is the number of resistance training activities per week. Generally speaking, 2-3 days per week is enough to improve strength levels. The frequency of resistance training should increase with age.

- (2) Intensity refers to activity difficulty. For resistance training, increased load or repetitions must be imposed on the muscle.

**STEP 1:** Maximum weight moved one time/repetition for any exercise = Z

**STEP 2:** Z x .50 to .70 = muscular endurance intensity; Z x .80 to .90 = muscular strength intensity  
Consider the following example:

**STEP 1:** Alex's maximum bench press is 210 pounds

**STEP 2:** 210 x .5 to .7 = 105 & 147 lbs. (endurance)  
210 x .8 to .9 = 168 & 189 lbs. (strength)

**Note:** See Time section below for more information about Alex.

- (3) Time is the number of repetitions per muscle exercise. For muscular endurance, do 8-12 repetitions for 3 sets per exercise. For muscular strength, do 3-5 repetitions for 3 sets per exercise.

For example, if Alex wants to improve his *muscular endurance*, he would gradually increase his bench press weight from 105 to 147 lbs. over 3 sets and do 8-12 repetitions per set.

To improve *muscular strength*, Alex would need to gradually increase his bench press weight from 168 to 189 lbs. over 3 sets and do 3-5 repetitions per set.

The chart below lists an average number of exercises per muscle group:

Muscles	Exercises
Chest	3-4
Back	3-4
Legs	4-5
Biceps	2-3
Triceps	2-3
Shoulders	2-3
Abdominal	1-2

- b) Develop a full-body routine.
  - c) Work larger muscle groups before smaller muscle groups.
  - d) Do multi-joint movements (e.g., bench press) before single joint movements (e.g., bicep curls).
  - e) Begin resistance training program using lighter weights and focus on muscular endurance.
4. Resistance training at the academy

A diverse range of calisthenics and weight training programs are used to build needed strength for the ROC physical abilities test.

### E. Adaptation

Repeated exercise produces changes in the body so it can respond better to the demands of physical work and stress. Adaptation occurs when extra demands imposed by physical training yield the following changes:

1. Heart function and circulation are improved.
2. Blood pressure and cholesterol levels are improved.
3. Muscle strength and muscular endurance are improved.
4. Muscle mass increases.
5. Fat mass decreases.

### F. Specificity

The body adapts specifically to the type of training it receives. For example, aerobic exercise will yield different body adaptations than resistance training. Thus, weight training to improve muscular strength has little value for improving cardiovascular endurance. Conversely, long distance running is not useful for developing muscular strength.

Adaptations are also specific to muscle groups trained. For example, to improve shoulder flexibility, the shoulder joint and surrounding muscles must be stretched.

### G. Rate of Improvement

Calisthenics, weight training, stretching, and aerobic exercise can yield improvement. Every individual responds differently to any given training program. Factors include, but are not limited to heredity, age, nutrition, lifestyle habits, sleep, motivation, and injury.

However, the rate and amount of improvement is directly related to the following:

1. Frequency of activity (how often you exercise each week?)

2. Intensity level (how hard you train?)
3. Time (how long you train each day?)
4. Initial fitness level (how fit were you when training began?)

### H. Overtraining

Physical training places stress on the body. The body needs adequate time to adapt and recover. Common signs of overtraining include, but are not limited to the following:

- Loss of appetite
- Difficulty sleeping
- Cold or flu like symptoms
- Sudden and extreme weight loss
- Constant joint or muscle soreness
- Changes in mood, depression or irritability

The the following strategies can reduce overtraining and help the body recover:

1. Use a wide variety of activities, intensity levels, and rest intervals.
2. Gradually increase intensity levels over weeks and months.
3. Maintain a regular sleep schedule.
4. Eat healthy foods and drink mostly water.

### I. Training Logs

Use training logs to monitor daily, weekly and monthly performance. Logs can be used to record the following exercise activity details:

1. Activity type
2. Dates and times

3. Training Heart Rates (THR)
4. Number of repetitions and load
5. Specific exercises and muscle groups
6. Amount of rest and recovery between workouts

### J. Body Composition

Body composition can be used to determine a person's overall health, fitness level and risk of certain diseases. However, body composition alone is not an automatic indicator of good fitness or health.

Three common methods used to determine body composition are:

- Body Fat Percent
- Waist to Hip Ratio
- Body Mass Index (BMI)

#### 1. Body Fat Percent<sup>1</sup>

Reliable methods used to determine body fat percent include calipers and hydrostatic weighing. The table below provides maximum body fat levels by age and gender.

Men		Women	
Age	%	Age	%
< 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%		

<sup>1</sup> Durnin et al 1985, Katch & McArdle 1973, Durnin & Rahaman 1967, Royal College of Physicians 1983.

### 2. Body Mass Index (BMI)

BMI measures individual "mass" and does not account for the total percentage of body fat, bone density, or other genetic variations.

BMI is calculated using a body weight and height ratio. Use the following calculation to determine BMI:

$$\text{Weight} / (\text{Height in inches} \times \text{Height in inches}) \times 703 = \text{BMI}$$

For example, Jack weighs 185 and is 69" tall.

$$185 / (69 \times 69 = 4761) \times 703 = 27.3 \text{ BMI}$$

A BMI  $\geq 30$  indicates a potential risk factor for chronic diseases such as high blood pressure, heart disease and diabetes. In general, any sum between 25-29 is considered overweight and 30 or above is considered obese.

### 3. Waist to Hip Ratio<sup>2</sup>

Fat accumulation on the body in specific areas can be a risk factor for diabetes and heart disease. To calculate waist to hip ratio, measure the narrowest point of the waist and the widest point of the hips.

Healthy waist to hip ratios for men and women are less than .8 and .9, respectively.

### K. Weight Control

In addition to reduced performance, excess weight or body fat increases muscle and heart workloads. For example, when an overweight person walks up stairs, his or her leg muscles have to lift more weight and their heart has to pump more blood to those muscles. Hence, overweight people have increased risks of injury and heart disease.

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<sup>2</sup> Pentz, Jane, Nutrition for professionals, 5th ed. MA: LMA Publishing, 1999; p. 99

In an effort to promote safety and optimal health, overweight student officer applicants should lose weight before the academy begins, **but should do so responsibly**. Effective weight reduction programs contain both nutrition and exercise components.

### 1. Reduce Food Intake

Successful weight loss programs include eating plans with the right amount of vitamins, minerals, and calories. There are 3500 calories in a pound of body weight. However, it takes approximately 15 calories to maintain 1 pound of body weight. Therefore, to determine daily calorie needs, multiply your current body weight by 15.

To lose weight, food intake should be reduced 500-1000 calories per day. For example, reducing food intake by 500 calories per day equals 1 pound of body weight loss per week. ( $500 \times 7 = 3500$ ). In general, a 2-3 pound loss per week is healthy and reduces the chance of regaining the weight back. **Moreover, losing weight too quickly can create health risks.**

**Note:** Use a log to keep track of daily calorie intake.

### 2. Make Healthy Food Choices

Food choices are directly related to number of calories consumed. For example, a candy bar has more calories than an apple. Moreover, calories from the candy bar are less healthy than the apple.

- a) Eat a variety of foods with emphasis on fruits, vegetables, and whole grain products.
- b) Eat the majority of complex carbohydrates (e.g., bread, pasta, etc.) at breakfast and lunch. Carbohydrates empty from the stomach first and provide more immediate energy.
- c) Eat protein rich foods like beef, fish, chicken, eggs and milk. Fat from protein empties the stomach last and helps you feel full longer.

- d) Drink water. The minimum recommendation is 13 cups (3 liters) for men and 9 cups (2.2 liters) for women. Avoid sugar beverages.
- e) Eat 5-6 smaller meals (or “graze”) throughout the day.
- f) Avoid or limit foods that are high in salt, processed sugar, and saturated fats. This includes, but is not limited to the following:
  - “fast” food
  - fried foods
  - sugar and fat desserts
  - microwaveable meals
  - processed cereals and snacks
  - high glycemic index carbohydrates
  - processed meats containing MSG & nitrites
- g) Plan and prepare meals that contain carbohydrate, protein, and fat.
- h) True or False?

### **Exercise increases appetite.**

True. 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.

**Some extra weight is "water-weight" that can be lost by sweating or drinking less fluid.**

False. Exercising in rubber suits, 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.

**Diets that eliminate or focus on specific food groups are effective in the long term.**

False. Fad 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.

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

True. 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.

**Quick-reducing diets are effective.**

False. 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.

### **You can spot-reduce fat in specific areas of body through diet.**

False. 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.

### 3. Exercise

Like reduced food intake, exercise helps with weight loss because calories are "burned" during physical activity. For example, burning 500 calories per day in exercise equals 1 pound of body weight loss per week. ( $500 \times 7 = 3500$ ).

Exercise intensity and time determines how many calories are burned. Consider the following ways to burn 500 calories:

<b>Ways to Burn 500 Calories</b>
Walk 5 miles (1.5 hours)
Jog 5 miles (1 hour)
Cycle for 60 minutes
Climb stairs for 80 minutes

## VI. Training Programs

Physical training programs include warm-up, activity, cool-down, and stretching phases.

### A. Warm-up

Begin every exercise session with a 5-10-minute warm-up. Effective warm-ups use slow, low intensity movements that increase blood flow to muscle groups needed for pending activity.

#### 1. Benefits of Warming Up

- a) Decrease risk of injury.
- b) Mentally prepare for exercise.
- c) Increase body temperature slowly.
- d) Increase heart rate and breathing gradually.

#### 2. Warm-Up Stretching Exercises

- a) “Side-to-Side & Down Look”

**Stretches neck muscles.** Look forward and slowly turn head left, back to center and right. Look forward and slowly lower chin down, then back up. Do not pin against chest.

- b) “Standing Cat Stretch”

**Stretches lower back muscles.** Stand with feet slightly beyond shoulder width and 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.



c) "Squat Turn"

**Stretches lower back muscles.** Stand with feet slightly beyond shoulder width and 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 both sides.



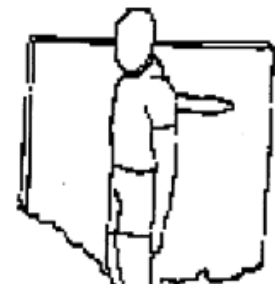
d) "Side Reach"

**Stretches trunk, arm and shoulder muscles.** Stand with feet shoulder width apart and knees slightly bent. Put 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.



e) "Chest Stretch"

**Stretches chest and shoulder muscles.** Stand next to wall 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.



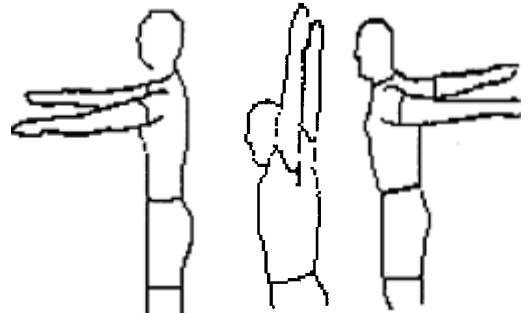
f) "Shoulder Pull"

**Stretches shoulder and arm 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, but do not rotate torso. Repeat on both sides.



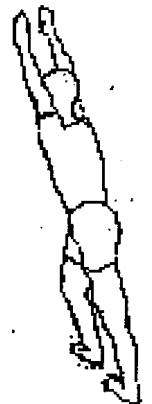
g) "Arm Circles"

**Stretches shoulder and arm muscles.** Stand with feet shoulder width apart and knees slightly bent. Slowly do 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.



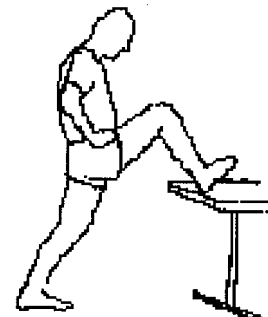
h) "Wall Lean"

**Stretches lower leg muscles.** Stand arm's distance away from wall with feet slightly apart. Put both hands on the wall. Keep 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.



i) "Side Stretch"

**Stretches leg muscles.** 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

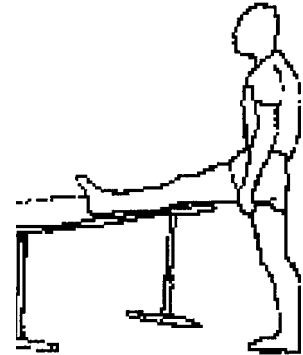


the front knee to go beyond the mid-foot. Repeat on the other side.

j) “Hamstring Stretch”

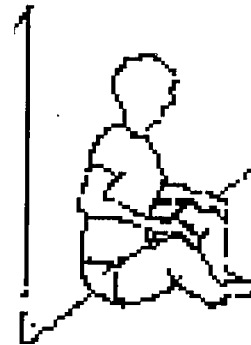
**Stretches hamstring leg muscles.**

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.



k) “Groin Stretch”

**Stretches groin muscles.** 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.



l) “Knee to Chest”

**Stretches lower back and rear thigh muscles.** 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.

m) “Supine Leg Stretch”

**Stretches back and thigh muscles.** 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.

### B. Activity

“Activity” refers to the primary method of exercise. This includes, but is not limited to aerobic and resistance training. Stop immediately and begin the cool down phase if any of the following happens:

- dizziness
- numbness
- difficulty breathing
- pain or tightness in chest
- sudden loss of coordination
- sharp pain in any muscle or joint

#### 1. Calisthenics

Calisthenics use body weight as the resistance. They can be performed without equipment or while using hand or ankle weights. Calisthenics are effective for developing muscular strength, muscular endurance, and flexibility.

When starting a fitness program, do each Callisthenic exercise as many times as possible. The goal is to increase the number of repetitions each week. Use a training log to record performance.

The following calisthenics are used frequently in the academy. Callisthenic routines can be performed 3-4 times per week.

- a) Push-Ups (see Fitness Assessment Testing section)
- b) Sit-Ups (see Fitness Assessment Testing section)
- c) Crunches

#### **Crunches target abdomen**

**muscles.** 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 2 repetitions per week.

d) Chin-Ups

**Chin ups target shoulder and arm**

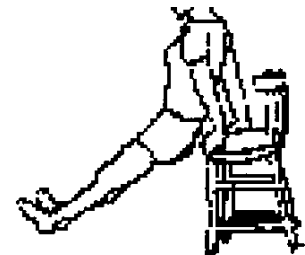
**muscles.** Grasp bar with palms facing you and hands shoulder width apart. Hang from the bar with arms fully extended. Keep head neutral or looking up slightly, pull upward pull by retracting shoulder blades toward each other, then begin to pull your chest toward the bar until your chin is over the bar. Lower slowly back to the arms full extended start position. Increase by 1 repetition per week.



e) Dips

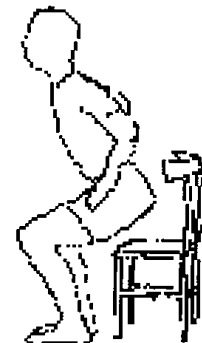
**Dips target arm, shoulder and chest**

**muscles.** 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 1 repetition per week.



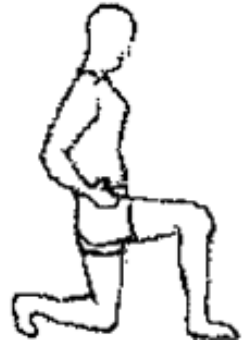
f) Chair Squats

**Chair squats target 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 by 1 repetition per week with a maximum of 25 reps.



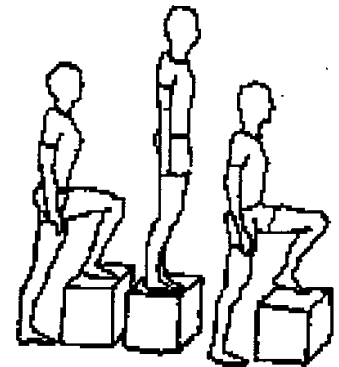
g) Lunges

**Lunges target 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. Return to the standing position. Increase by 2 repetitions per week with a maximum of 25 reps.



h) Bench Steps

**Bench steps target 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 time for each lead foot by 10 seconds per week, up to a maximum of 60 seconds.



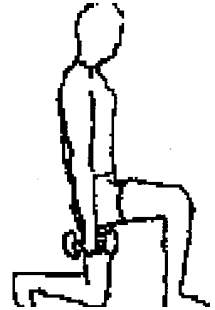
i) Standing Side-Leg Lifts

**Standing side-leg lifts target hip and 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. Return to the standing position. Increase by 2 repetitions per week with a maximum of 25 reps per side.



j) Opposite Arm & Leg Lifts

**Opposite arm and leg lifts target leg, shoulder and lower back muscles.** 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. Return to the standing position. Increase by 1 repetition per week with a maximum of 15 reps per side.



k) Hand-Grip

**Hand-grip targets forearm 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.

2. Weight Training

Weight (resistance) training includes exercises that involve moving weight that is external to the body. Weight training can be used to develop muscular strength and muscular endurance.

For [muscular endurance](#), weight should allow for 3 sets of 8-12 repetitions per exercise. For [muscular strength](#), weight should allow for 3 sets of 3-5 repetitions per exercise. The goal is to increase weight or number of repetitions. Use a training log to record performance.

Resistance training routines can be performed 2-3 times per week using free weights, “machines” or a combination. Use caution when using free weights (e.g., barbells). Improper form, grip and movement can cause injury.

The following weight training exercises are listed in recommended order of performance.

a) Lunges

**Lunges target leg muscles.** Suggested initial weight is 25% of body weight. 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. Press back up to the starting position. Perform the same number of lunges on the other side.

b) Toe Raises

**Toe raises target lower leg muscles.**

Suggested initial weight is 10% of body weight. 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.



c) Side Leg Raises

**Side-leg raises target hip and thigh muscles.** Suggested initial weight is 25% of body weight. 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.

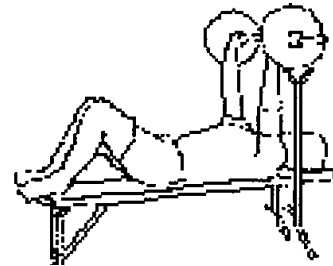
d) Bench Step

**Bench step targets 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.

e) Bench Press

**Bench press targets chest, shoulder and arm muscles.**

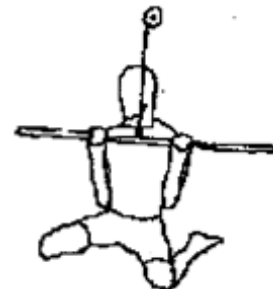
Suggested initial weight is 30% of body weight. Lie on your back on a bench with your feet on the bench. Hold the bar above the chest with an overhand grip, hands slightly wider than shoulder width, and elbows straight. Lower the bar to approximately 1 inch above the chest or touching the chest, maintaining upper arms at a 45-degree angle or less relative to your torso, and then return to starting position.



f) Lat Pull-Down

**Lat pull-down targets upper and middle back muscles.**

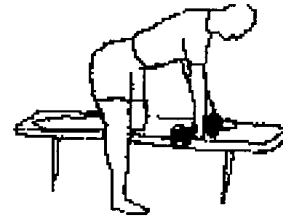
Suggested initial weight is 30% of body weight. Grip the bar with palms facing toward or away from you. neutral grip slightly wider than shoulder-width apart or wider. From a sitting position or kneeling position, with arms stretched overhead, lean your torso back slightly and pull the bar towards the chest. It is not necessary to touch the chest. Return to the starting position.



g) Bent Over Row

**Bent over row targets upper and middle back muscles.**

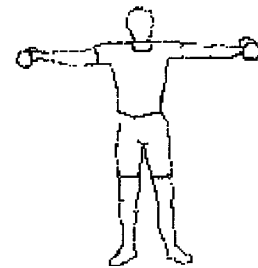
Suggested initial weight is 30% of body weight. Stand next to bench with right hand and right knee on top of bench. Maintain flat back position with head neutral. Grasp dumbbell in left hand. Pull left elbow towards ceiling brushing left forearm by ribcage. Slowly return to starting position. Repeat on the other side.



h) Lateral Raise

**Lateral raise targets shoulder muscles.**

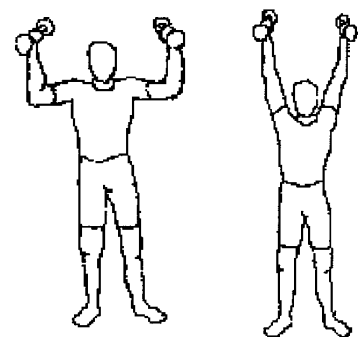
Suggested initial weight is 20% of body weight. Stand erect with feet shoulder width apart and knees slightly bent. Hold dumbbells slightly forward of thighs. Maintain a slight bend in the elbow as you raise the arms to shoulder level. Hands should remain in peripheral vision. Slowly return to starting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



i) Overhead Press

**Overhead press targets shoulder muscles.**

Suggested initial weight is 25% of body weight. 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.



j) Arm Curls

**Arm curls target bicep and forearm muscles.** Suggested initial weight is 10% of body weight. 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.

k) Triceps Push-Down

**Triceps push-downs target triceps muscles.** Suggested initial weight is 10% of body weight. 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.

3. Aerobic Training

Aerobic training is any large muscle group activity that allows you to maintain a THR for at least 20 minutes. This includes, but is not limited to jogging, walking, bicycling, stair climbing, swimming, rowing, and in-line skating.

C. Cool-Down

The cool-down phase is a 5-10-minute transition from high to low intensity exertion. A gradual reduction in heart rate and blood circulation following exertion is critical for injury prevention. The cool-down also helps reduce muscle soreness.

**Note:** Abruptly stopping an intense activity without cooling down can cause dizziness and even fainting.

### D. Stretching

After the cool-down phase, *static* stretch for 10 minutes to improve joint flexibility. The following stretches are effective for improving flexibility in each muscle group. Same stretches used for warm-up phase can be used.

**\*End of Document\***