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# TABLE OF CONTENTS

<b>PREFACE</b> .....	1
<b>SECTION I: INTRODUCTION</b> .....	2
Purpose .....	2
Federal Air Marshal Training Program (FAMTP) .....	2
Practical Exercise Performance Requirements .....	3
FAMTP Firearms Training Program .....	3
Federal Air Marshal Service (FAMS) Practical Pistol Course (PPC) .....	3
<b>SECTION II: PHYSICAL TRAINING ASSESSMENT (PTA)</b> .....	4
Preparing for the FAMS Physical Task Assessment .....	4
Muscular Fitness .....	4
Joint Flexibility .....	7
Aerobic Fitness .....	7
Utilizing Heart Rate in Training .....	9
<b>SECTION III: EXERCISE SUGGESTIONS SPECIFIC TO PTA EVENTS</b> .....	10
Event: Pull-Up .....	10
- Pull-Up.....	10
- Partner-Assisted Pull-Up .....	11
- Assisted Negative Pull-Up .....	11
- Wide-Grip Pull-Down .....	11
Event: Sit-Up .....	12
- Sit-Up .....	12
- Crunches .....	13
Event: Push-Up .....	14
- Push-Up .....	14
Event: 1.5-Mile Run .....	15
- Interval Training .....	15
- Hill Running .....	15
- Long, Slow Distance Running .....	15
<b>ATTACHMENT I</b> .....	1 – 1
Practical Exercise Performance Requirements .....	1 – 2
- Physical Conditioning .....	1 – 2
- Employ Defensive Tactics .....	1 – 2
- Aircraft Tactic Training .....	1 – 3
- Firearm Training .....	1 – 3
<b>ATTACHMENT II</b> .....	2 – 1
The Pull-Up Assessment Protocol .....	2 – 2
Pull-Up Scoring Chart.....	2 – 3

<b>ATTACHMENT III</b> .....	3 – 1
The Sit-Up Assessment Protocol .....	3 – 2
Sit-Up Scoring Chart .....	3 – 3
<b>ATTACHMENT IV</b> .....	4 – 1
The Push-Up Assessment Protocol .....	4 – 2
Push-Up Scoring Chart .....	4 – 3
<b>ATTACHMENT V</b> .....	5 – 1
The 1.5-Mile Run Assessment Procedure And Protocol .....	5 – 2
1.5-Mile Run Scoring Chart .....	5 – 2
<b>ATTACHMENT VI</b> .....	6 – 1
Everyday Stretches .....	6 – 2
<b>ATTACHMENT VII</b> .....	7 – 1
Monitoring Your Heart Rate .....	7 – 2
How to Take Your Exercise Pulse Rate .....	7 – 2
Training Heart Rate Calculations .....	7 – 2
<b>ATTACHMENT VIII</b> .....	8 – 1
Overuse Syndromes / Overtraining .....	8 – 2
- Minor Exercise Problems .....	8 – 2
- Are You Over Training? .....	8 – 3
<b>ATTACHMENT IX</b> .....	9 – 1
Water and Exercise .....	9 – 2
- Tips to Ensure Adequate Water Balance .....	9 – 2
<b>ATTACHMENT X</b> .....	10 – 1
Exercise and the Environment .....	10 – 2
- Acclimatization to the Cold .....	10 – 2
- Frostbite and Hypothermia .....	10 – 2
- Windchill: When Is It Dangerous? .....	10 – 3
- To Beat the Heat .....	10 – 3
- Humidity Chart .....	10 – 4
- Exercising at Altitudes .....	10 – 4
- Air Pollution .....	10 – 5
<b>ATTACHMENT XI</b> .....	11 – 1
Exercise Log .....	11 – 2
Workout Card .....	11 – 3

## PREFACE

The major objective in physical training is to cause biologic adaptations to improve performance in specific tasks. This requires adherence to carefully planned and executed activities.

Applicants with superior physical training and conditioning are stronger, better coordinated, and less subject to injury. Training and conditioning can be broken down into three basic components, the development of:

1. Muscular Fitness
2. Joint Flexibility
3. Aerobic Fitness

All three components are necessary in a training program to maximize safe physical performance.

The cornerstone of physical training is the law of specificity, which means that the body makes specific adaptation to imposed demands. The more specific the demands, the more specific the adaptation. Pre-training programs and assessment events should be as specific as possible to those delivered during the required training.

Minimum levels of strength, flexibility, and cardiovascular endurance are necessary to ensure safe, progressive participation in the specific physical events demanded from the Federal Air Marshal trainees. Physical conditioning affects proficiency in the safe operation and handling of firearms as well as in the application of defensive tactics holds and use of handcuffs on a passive training partner.

**SECTION I:****INTRODUCTION****Purpose**

The Federal Air Marshal Pre-Training Guide is distributed to individuals who have applied to become Federal Air Marshals (FAMs).

The purpose of this training guide is to provide applicants advance notice of the physical tasks and firearms requirements during the Federal Air Marshal Training Program (FAMTP) and training methods that can be utilized by the applicant to prepare for safe, successful participation in the physical and firearms training conducted during the FAMTP.

The objective of the FAMTP Pre-Training Guide is to ensure that applicants selected for employment report to FAMTP fully accustomed to a daily fitness regime, in best possible physical condition and able to successfully complete the FAMTP.

**Federal Air Marshal Training Program (FAMTP)**

Upon entrance to duty with the Federal Air Marshal Service (FAMS), the employee must successfully complete training in order to become a FAM. Training takes place in two stages; the initial FAMS 35-day basic training program, conducted at Federal Law Enforcement Training Center in Artesia, NM and the advanced 43-day training program conducted at the FAMS Training Center in Atlantic City, NJ. For successful completion of the training program, each student must possess adequate cardiovascular fitness as well as upper and lower body strength and arm-hand strength and steadiness. Normal vocal ability and eyesight is also required.

Trainees are subjected to a rigorous daily physical training program during the FAMTP. This daily program may include the following:

- **Strength Training** – Routines which include weight training, calisthenics and variations of sit-ups, push-ups and pull-ups at least 3 days per week.
- **Flexibility Training** – Routines which stretch the areas of lower back, hip, leg, shoulders, arms and neck at least 3 days per week.
- **Agility Training** – Tactical Conditioning courses run several times during the length of the two-stage training program.
- **Cardiovascular Training** – Short, fast running courses and long, slow running courses over flat or cross country terrain 3 to 4 days per week.

- **Defensive Measures Training** – Includes using limbs to block and deliver blows, throws and control holds, boxing, taking falls, take-downs, grappling/tactical ground defense, confrontational cuffing, firearms retention and weapons disarming.

## **Practical Exercise Performance Requirements (PEPR)**

Practical Exercise Performance Requirements are physical activities related to law enforcement tasks, e.g., conducting searches and making arrests. See attachment I for a PEPR list identifying the training tasks and performance requirements for the FAMTP. Students must satisfactorily perform these requirements to successfully complete the training program.

## **FAMTP Firearms Training Program**

Federal Air Marshals are authorized by law to carry firearms pursuant to Title 49 United States Code, Sections 114(q) and 44903(d). The FAMS requires that each FAM be proficient in the safe operation and handling of all authorized weapons. Federal Air Marshals are required to carry their firearm on duty and be able to use it to protect citizens, fellow FAMS and/or themselves. A FAM must be able to draw and fire accurately under extreme pressure and time constraints.

The entire training program for FAM trainees is approximately 16 weeks. Firearms training begins during the first week and consists of approximately 155 hours of lectures, shooting and practical problems. The trainee will fire approximately 5,800 rounds with the semiautomatic pistol.

The FAM trainee must demonstrate knowledge, proficiency, and proper judgment in the use of the issued handgun. Safety procedures will be explained in detail to FAM candidates during orientation meetings with the Firearms Instructors. No trainee will be permitted on the firing line unless he/she has indicated that all safety procedures are fully understood.

## **Federal Air Marshal Service Practical Pistol Course (PPC)**

The trainee must qualify on the FAMS PPC after basic firearms training with the issued handgun. The course consists of 60 rounds fired at distances up to 25 yards. The course involves close quarters, intermediate distance, and long distance barricade shooting. The trainee will have to move to a kneeling position or a barricade position, both standing and kneeling while holding a firearm. The trainee will also manipulate the trigger for single and multiple round strings of fire and fire the weapon single handed using both right and left hand independently.

## **SECTION II:**

# **PHYSICAL TRAINING ASSESSMENT (PTA)**

The Office of Training and Workforce Programs requires that all FAM applicants take the PTA during the application process. There is no minimum required score; however, the fitness evaluation level achieved is a factor considered in the applicant assessment process. The purpose of the PTA is to provide the Federal Air Marshal Service with an indication of the applicant's present ability to successfully participate in strenuous physical activity during the FAMTP with minimized risk of injury. The PTA is administered to the applicant by the FAM Physical Fitness Coordinator (PFC).

The PFC will evaluate your performance level in the following physical tasks:

- Pull-Ups
- Sit-Ups
- Push-Ups
- 1.5 Mile Run

The above tasks are performed in the order listed, one after the other with minimal rest in between events. Physical Training Assessment protocols are described in ATTACHMENT II through V. If selected to attend FAMTP, additional PTAs will be administered during the course of training.

## **Preparing for the FAMS Physical Training Assessment**

- **Adaptation** – Training creates subtle changes in the body as the body responds to increasing demands. Day-to-day changes are generally so small as to be immeasurable. Weeks and sometimes months are required to achieve improved respiration, heart function, circulation, muscular strength, power, endurance as well as tougher bones, ligaments, tendons, and connective tissue.
- **Overload** – Training must place demands on the body that are greater than what the body is currently capable of handling. The rate of improvement is related to three factors: Frequency, Intensity and Time.

## **Muscular Fitness**

An individual's degree of muscular fitness depends on a combination of **strength** (the greatest amount of force a muscle or muscle group can exert in one movement), **power** (the speed of movement or rate at which a resistance can be moved) and **endurance** (how long a muscle or group of muscles can continue to function with their available

strength over a period of time). Muscular fitness may be improved with calisthenics, free weights or weight machines. The key is to apply resistance to various muscle groups for a sufficient period of time or number of repetitions. In general, **strength and power** training uses high resistance with low repetitions and **endurance** training uses low resistance with high repetitions.

A safe basic muscular fitness development program must include the following:

- **Warm-Up and Cool Down** – Gradually increase and decrease heart rate in order to prepare the body for exercise and cessation of exercise (see Joint Flexibility section and ATTACHMENT V for stretching recommendations).
- **Major Muscle Groups** – Progress from large to small muscles and work each muscle group.
- **Full Range of Motion** – Always perform an exercise through the entire range of movement that is possible around a specific joint or joints.
- **Positive and Negative Phases** – The positive phase is the most difficult portion of the exercise and the negative the least difficult. When the positive phase of the exercise can no longer be performed, continuing to work the negative phase is very helpful in gaining strength and is an excellent way to intensify the training effect of a workout.
- **Opposing Muscles** – Strength development must be balanced in order to maintain symmetry and prevent injuries. For example, if the abdominals are strengthened, the lower back must also be strengthened.
- **Proper Breathing Techniques** – Always breathe when lifting. Exhale during any positive phase; inhale on the negative phase.
- **Progression** – To achieve adaptations using the overload principle, training must follow the principle of progression. When the training load is increased too quickly, the body cannot adapt and instead breaks down. Training cannot be rushed. The body requires gradual increases in demand as well as periods of rest in order for adaptations to take place.
- **Specificity** – The type of training you undertake must relate to the desired results. Performance improves most when the training is specific to the activity.
- **Warm-Up** – Warming up prepares the body for exercise by gradually increasing heart rate and blood flow, raising the temperature of muscles and connective tissue, and improving muscle function. Warm-ups guard against muscle, tendon, and ligament strains. Whether running,

performing calisthenics, or lifting weights, it is essential to warm-up first, then stretch.

- **Cool-Down** – The cool-down is just as important as the warm-up. Abrupt cessation of vigorous activity leads to pooling of the blood, sluggish circulation, and slow removal of waste products. It may also contribute to cramping, soreness, or more serious problems such as irregular heartbeats. Light activity and stretching continues the pumping action of muscles on veins, helping the circulation in the removal of metabolic wastes and lowering the body temperature.
- **Fluid Replacement** – When you exercise intensely, indoors or out, in warm or cold environments, you need to replace fluids lost through sweating. At the very least, neglecting to compensate for fluid loss can cause lethargy and nausea, interfering with your performance. Severe water loss can be hazardous to your health, potentially producing heat exhaustion or heat stroke.
- **Adequate Footwear** – One of the most essential elements of your training is proper footwear. Wearing improper or worn-out shoes places stress on your hips, knees, ankles, and feet. A firm, thick sole, good arch support, and thick padded heel are essential. A good shoe will be well padded under the sole but not terribly difficult to bend at the ball of the foot. A firm heel counter that is perpendicularly attached to the sole is also important. All-purpose tube socks that wick away moisture may help to prevent bothersome blisters.
- **Safety** – The key to successful strength training is the quality of the training or exercises, not the amount of weight used. Injuries are often caused by the desire to lift as much as possible which goes against the main purpose for exercising. Adhering to the principles and techniques of a safe, progressive training program will minimize chances of injury.
- **Rest and Recovery** – Rest and recovery time needs to be included in all muscle training programs. Recovery time allows the muscles to build strength. Staleness and retrogression occur when proper recovery time is not allowed. The recovery period for any particular muscle is at least 48 hours between workouts.

## Warning Signs

- **Heat Exhaustion** – Results from inadequate replacement of fluids lost through sweating. Signs and symptoms include fainting, profuse sweating, flushed skin, mildly elevated temperature, dizziness, hyperventilation and rapid pulse.
- **Heat Cramps** – Extremely painful muscle spasms that occur in your muscles but most commonly in the calf and abdomen. Heat cramps are related to some imbalance between water and several electrolytes or ions (sodium, potassium, magnesium, and calcium).
- **Heat Stroke** – The body will lose the ability to dissipate heat through sweating which is very serious, life-threatening emergency. Signs and symptoms include sudden collapse with loss of consciousness, pale skin, sweating and relatively dry skin; and a core temperature of 106° or higher.

Even if you do not feel thirsty, it is important to drink at regular intervals when exercising. See Attachment XI.

## Joint Flexibility

Flexibility is the mobility or range of motion in a joint. This range of motion is determined by the direction in which the joint bends and the resistance from the surrounding soft tissues such as the skin, tendons, ligaments, and muscles. Flexibility is highly specific and not equally apparent in all joints of the body.

Muscles that are short and restrict the natural range of motion in the joints are more susceptible to pulls, tears and stress injuries than those that are long enough to allow a full range of motion.

To increase flexibility, muscles need to be regularly stretched slightly beyond their normal length four to seven days a week. For maintaining flexibility, three days a week is probably adequate.

The key to stretching is to remain relaxed during the exercise. For the best results, exhale into a stretch, hold the stretch for 15 to 30 seconds, pause and then repeat the stretch once or twice. (See Attachment VIII)

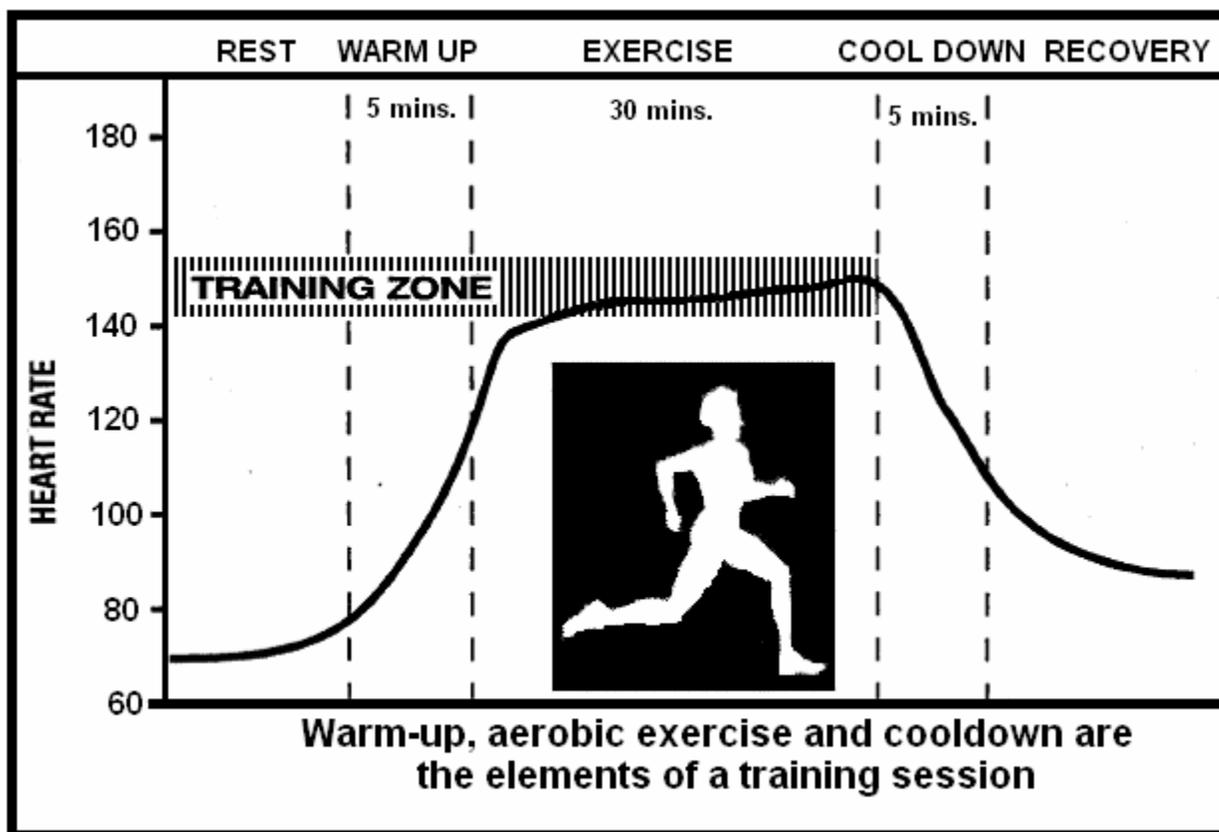
## Aerobic Fitness

Aerobic fitness describes how well an individual is able to take oxygen from the atmosphere into the lungs and blood, then pump it to working muscles where it is

utilized to oxidize carbohydrates and fats to produce energy. Aerobic means with air or oxygen. If you are not able to carry on a short conversation, you are working anaerobically or above your aerobic threshold.

Rhythmic exercises that demand increases in respiration, circulation, and muscle metabolism and that can be sustained for long periods of time are defined as aerobic exercises. Brisk walking, jogging, running, swimming, cycling, cross country skiing and rowing are a few common aerobic exercises.

Performing aerobic exercises at your target heart rate for 30 minutes (preceded by a 5-10 minute warm-up and followed by a 5-10 minutes cool down) three to five times a week is the accepted standard for boosting your body's ability to utilize oxygen.



## Utilizing Heart Rate in Training

One way to tell if your exercise intensity is creating a training effect is by checking your training heart rate. The following four steps help you to determine your Target Heart Rate:

Step 1. 220 minus full age = **Maximum Heart Rate (MHR)**

$$220 - \text{[ ] (full age)} = \text{[ ] (MHR)}$$

Step 2. **MHR** minus resting heart rate = **RANGE**

$$\text{[ ] (MHR)} - \text{[ ] (resting heart rate)} = \text{[ ] (range)}$$

Step 3. **RANGE** x % intensity desired (60 – 90%)

Step 4. **PLUS** resting heart rate = **TARGET HEART RATE**

$$\text{[ ] (range)} \times .60 + \text{[ ] (resting heart rate)} = \text{[ ] (target heart rate)}$$

## Utilizing Heart Rate in Training

### Frequency

- |                                |                     |
|--------------------------------|---------------------|
| 1. Average Fitness Level       | 3 Days per Week     |
| 2. Above Average Fitness Level | 5 – 6 Days per Week |

### Intensity

- |                                |                             |
|--------------------------------|-----------------------------|
| 1. Average Fitness Level       | 70 – 75% Maximum Heart Rate |
| 2. Above Average Fitness Level | 80 – 90% Maximum Heart Rate |

### Time

- |                                |                 |
|--------------------------------|-----------------|
| 1. Average Fitness Level       | 30 Minutes      |
| 2. Above Average Fitness Level | 45 – 60 Minutes |

### Type

1. Large Muscle Activity
2. Rhythmic Movement
3. Continuous vs. Start/Stop Activity

## ***SECTION III:*** **EXERCISE SUGGESTIONS SPECIFIC TO PTA EVENTS**

**Event: Pull-Up**

Suggested Exercise: Pull-Up

To strengthen the upper back; Hang from a chin-up bar with arms fully extended, hand position is either slightly wider than shoulders, gripping with the palms forward or hands slightly inside shoulder width, gripping with palms reversed. Pull up until your chin is over the bar. Lower yourself to the starting position. Keep body straight. Repeat as many times as possible. When you can no longer do the “pull” (positive) portion of the pull-up, assist yourself up and lower yourself down slowly until you can no longer do the “down” (negative) portion of the pull-up.

Illustration:





**Event: Sit-Up**

Suggested Exercise: Sit-Up

Perform the sit-up three days per week or every other day keeping to the proper form described in Attachment II. Do the maximum number of sit-ups that you can one day a week. Try to improve on the number you do every week. On the other two days, do slow sit-ups in the positive and negative phases. In the positive phase, assume your regular sit-up form in the down position, slowly raise yourself up, taking approximately four seconds, then return to the down position in one second. In the negative phase, start in the up position, slowly lower yourself taking approximately four seconds, then return to the up position in one second. Do as many slow sit-ups as possible, emphasizing precision and proper form.

Illustration:



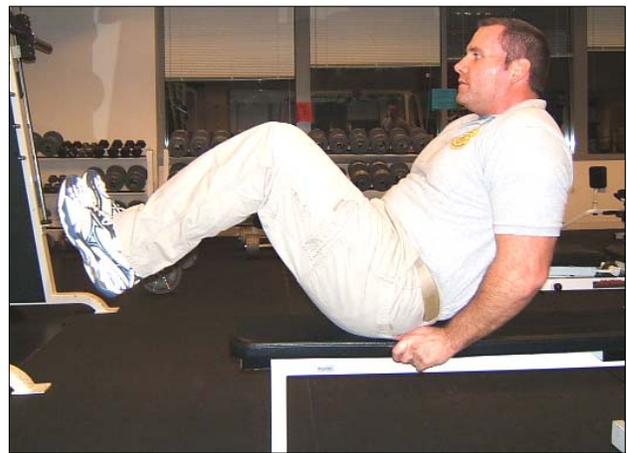
**Suggested Exercise:**      **Crunches**

To strengthen the abdominals, lie flat on the floor with your legs bent at a 45° angle and your arms at the sides of your head without interlacing your fingers behind your head. Lift your head and upper torso together toward the ceiling until you have achieved a full contraction of the abdominal muscles. Hold briefly and then return slowly to the starting position. Inhale during the contraction and exhale as you lower your torso. Begin with one set of 15 and work up to three sets of 15 to 30 contractions.

**Suggested Exercise:**      **Seated Leg-Tuck**

To strengthen the lower abdominals, sit on a flat bench, place your hands behind your buttocks and grasp the bench for support. Sit back slightly and raise your feet a few inches off the floor. Bend your knees and bring your torso slightly forward until your thighs touch your chest. Return slowly to the starting position. Inhale during the contraction and exhale as you lower your legs. Begin with one set of 10 and work up to three sets of 15 to 20.

Illustration:



**NOTES:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Event: Push-Up

Suggested Exercise: Push-Up

The push-up remains one of the best upper-body exercises around, in that it can be performed anywhere, requires no equipment, and is easily adapted to any level of proficiency. The standard push-up works muscles in the shoulders, back of upper arms, and chest. It also exercises muscles in the abdomen, hips, and back, which are tensed to keep the body stiff while it moves up and down. However, these benefits occur only when push-ups are performed properly.

Perform the push-up three days per week or every other day keeping to the proper form described in **ATTACHMENT III**. Do the maximum number of push-ups that you can one day per week. Try to improve on the number you do every week. On the other two days, do slow push-ups. Assume your regular push-up form in the down position, then slowly push yourself up, taking approximately four seconds. Start by doing as many push-ups in this manner as possible, emphasizing precision and keeping your back straight and head up.

When you can no longer do the “push” (positive) portion of the push-up, let your knees rest on the floor to help you return to the up position. Once back to the up position, lift your knees off the floor, keep your body stiff (supporting points are now toes and hands) and let yourself down slowly until you can no longer do the “down” (negative) portion of the push-up.

Start by doing one set of these slow push-ups. After the first couple of weeks, increase to two sets with approximately a one-minute rest between sets.

Working the negative portion of the push-up will do two things. First, you will stress your muscles sufficiently to increase their strength. This won't happen if you merely do a set or two of 25 to 30 push-ups. Second, you will increase the number of correctly-performed push-ups you can do more quickly than if you stop when you can no longer do the positive portion of this exercise.

### Important Safety Precaution

Be careful to breath; do **not** hold your breath.

Illustration:



**Event: 1.5-Mile Run**

Suggested Exercise: Interval Training

Interval training can be applied to nearly any aerobic exercise. Alternate 15 seconds to three minutes of high-intensity intervals of the same length. During the intense bouts, your heart rate should reach 85 – 90% of its maximum. During the recovery periods, do not let your heart rate drop below 65% of its maximum.

Suggested Exercise: Hill Running

The extra burden of pushing up hills strengthens all of your running muscles by overload. This kind of training is the most valuable a runner can do, not just because it makes the muscles stronger and more effective, but because it builds the muscles in **the act of running**. Hill training allows you to develop rhythm and control as you build strength. You may repeat hills once or twice a week, but avoid consecutive days so your legs have a chance to recover.

Important Safety Precaution
<p>Problems or injuries in the Achilles and calf areas will worsen under hill work. Contrary to popular belief, running downhill is much riskier for the joints and muscles in your feet and legs than running uphill. To avoid injury, never run straight down a steep hill – run down in a zigzag pattern, leaning slightly forward and keeping your knees bent.</p>

Suggested Exercise: Long, Slow Distance Running

A weekly long run is the backbone of any endurance running program. An upright posture conserves energy. Run with your back comfortably straight, head up, and shoulders relaxed. Slightly bend your arms and hold your hands in a comfortable position. Keep arm swing to a minimum – pumping action increases only with speed. Your legs should swing freely from the hip with no attempt to overstride. Your foot strike should be heel to toe push off.

**NOTES:** \_\_\_\_\_  
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# **ATTACHMENT I**

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## Practical Exercise Performance Requirements

# PRACTICAL EXERCISE PERFORMANCE REQUIREMENTS

Practical Exercise Performance Requirements (PEPR) are physical activities related to law enforcement tasks, e.g., conducting searches and making arrests. The Federal Law Enforcement Training Center (FLETC) has identified a PEPR list for each training program. Students must satisfactorily perform these requirements to successfully complete the training program. The Center's Board of Directors approved implementation of PEPR on October 19, 1982. The purpose of the PEPR is to reduce the number of students reporting to the Center with physical impairments that would prevent their successful completion of the requirements.

The following PEPR apply to the Federal Air Marshal Service. For successful completion, each student must possess adequate cardiovascular fitness as well as upper and lower body strength and arm-hand strength and steadiness. Normal vocal ability and eyesight is also required.

## Physical Conditioning

- Participate in a variety of physical activities involving principally strength and cardiovascular endurance. This may consist of, but is not limited to, jogging, weight training, calisthenics, and warm-up exercises.

## Employ Defensive Tactics

- Use rapid and coordinated body movements to control an adversary and/or defend against physical attack.
- Have joint structures that are completely flexible and free of any abnormalities that can withstand force/pressure during non-lethal control techniques.
- Participate fully, both offensively and defensively in all course requirements (i.e., throws, being thrown, takedowns, and restraint applications).
- Strike repeatedly a hand-held bag using feet, knees, hands, and elbows for 20 seconds.

## Aircraft Tactical Training

All previously listed performance requirements for “Employ Defensive Tactics”, plus:

- Requires an individual to move swiftly from a seated position to a position of cover and to then strategically maneuver inside commercial single and wide-body aircraft.
- Control an adversary physically during takedowns and restraint techniques within the confines of single and wide-body aircraft.
- Have sufficient strength/endurance to maintain a one or two-knee kneeling barricade position.
- Maintain a kneeling position for 2-3 minutes repeatedly (10-15 times) throughout each two-hour session.
- Have sufficient strength and full range of motion of both arms and shoulders and the manipulative dexterity of the hands to properly handcuff, search, and control a subject.
- Participate fully, both offensively and defensively, in all course requirements (i.e., throws, being thrown, takedowns, and restraint applications).

## Firearm Training

- Stand for a period of one (1) hour.
- Kneel on one knee, holding handgun with both hands, arms extended in front of body at eye level for seven (7) seconds. Must be able to rise unassisted. Repeat twice.
- Assume a one or two-knee kneeling position behind cover within two (2) seconds. Must be able to rise without assistance. Repeat twice.
- Extract handgun from a tight fitting holster in one second or less, hold handgun with both hands, arms extended in front of body at eye level for 24 seconds. Must have adequate hand and wrist strength to control the weapon during recoil with service ammunition.
- Pull the trigger of a handgun in double action mode (approximately 14-15 pounds of pressure) two times in four (4) seconds for a total of 54 trigger pulls in 2 minutes. Trigger is pulled using only the trigger finger of the

strong hand while holding the weapon at arm's length in the strong hand and supporting it with the weak hand.

- Pull the trigger of a handgun in double action mode with the trigger finger of the weak hand, six (6) times. This must be accomplished by holding the weapon at eye level and at arm's length with the weak hand only.
- Have hand and finger dexterity to safely and effectively load, unload and manipulate the handgun. If the weapon is a semi-automatic pistol, the student must have sufficient hand and wrist strength to load magazines and to manipulate the slide of the pistol during charging and clearing operations.
- Have sufficient eyesight to be able to clearly focus on the sights of a handgun held at arm's length. Corrective lenses are allowed. Must be able to visually discriminate between friend/foe targets at a distance of 25 yards.
- Hear range commands broadcast over a public address system while wearing hearing protection.

# **ATTACHMENT II**

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## The Pull-Up Assessment Protocol

## THE PULL-UP ASSESSMENT PROTOCOL

The Pull-Up Assessment is a measurement of how long a muscle or group of muscles can continue to function with their available strength over a period of time. The muscle groups in the Pull-Up Assessment are upper arms, shoulders and upper back.

- The Pull-Up Assessment is the first in the sequence of events in the PTA.
- Candidates will perform as many repetitions as possible with no time limit.
- Candidates will grasp the pull-up bar in either a “Hands Forward” or “Hands Reversed” manner.
- Once a grip is established, the Candidate may not change grips.
- Candidates will begin the pull-up in the hanging position when the Instructor advises them to start.
- Candidates will pull the body straight up until the chin is above the bar. This is one repetition.
- Candidates will then lower the body straight down in a controlled manner until the arms and elbows are fully extended. Candidates may rest in the down position.
- Candidates must maintain proper form at all times.
- If the Candidate does not maintain proper form (i.e. chin is not over bar, body does not remain straight, etc.), that repetition will not count.
- Once a Candidate releases the bar, he or she may not remount the bar.
- Breathe out during the “pull” (positive) portion of the pull-up, breathe in during the “down” (negative) portion of the pull-up.
- **There will be no more than a five-minute recuperation period between the Pull-Up Assessment and the Sit-Up Assessment.**



Starting Position



Up Position

**Pull-Up Scoring Chart:**

AGES	MALES				FEMALES			
	20 – 29	30 – 39	40 – 49	50 – 59	20 – 29	30 – 39	40 – 49	50 – 59
<b>Excellent</b>	> 10	> 9	> 7	> 4	> 3	> 3	> 3	> 3
<b>Good</b>	9 – 10	8 – 9	6 – 7	3 – 4	3	3	3	3
<b>Fair</b>	7 – 8	6 – 7	4 – 5	2	2	2	2	2
<b>Poor</b>	5 – 6	3 – 5	2 – 3	1	1	1	1	1
<b>Very Poor</b>	< 5	< 3	< 2	< 1	< 1	< 1	< 1	< 1

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# **ATTACHMENT III**

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## The Sit-Up Assessment Protocol

## THE SIT-UP ASSESSMENT PROTOCOL

The Sit-Up Assessment is a measurement of how long a muscle or group of muscles can continue to function with their available strength over a period of time. The muscle groups used in the Sit-Up Assessment are the abdominal group.

- The Sit-Up Assessment is **second** in the sequence of events in the PTA.
- Candidates will perform as many repetitions in as possible **1-minute**.
- Candidates will lie on their back, knees bent at a 90 degree angle, heels in contact with the floor, arms crossed over their chest with hands on shoulders or under the arms. Partners will hold the candidate's feet in place.
- Candidates begin the sit-up from the down (shoulder blades touching the ground) position.
- Candidates will raise their upper body off the ground until their elbows come in contact with their knees. This is one repetition.
- Candidates will then lower the upper body back to the ground until the shoulder blades come into contact with the ground and continue to repeat the sit-up.
- Candidates may only rest in the up position, with elbows touching the top of their knees. Failure to be in the up position if choosing to rest will terminate the event.
- If the Candidate does not maintain proper form (i.e. buttocks raises off the ground, shoulder blades do not touch the ground. etc.), that repetition will not count.
- Breathe out during the "up" (positive) portion of the sit-up, breathe in during the "down" (negative) portion of the sit-up.
- **There will be no more than a five-minute recuperation period between the Sit-Up Assessment and the Push-Up Assessment.**



Up and Resting Position



Starting Position

**Sit-Up Scoring Chart:**

AGES	MALES				FEMALES			
	20 – 29	30 – 39	40 – 49	50 – 59	20 – 29	30 – 39	40 – 49	50 – 59
<b>Excellent</b>	> 46	> 42	> 38	> 34	> 43	> 34	> 28	> 23
<b>Good</b>	42 – 46	39 – 42	34 – 38	28 – 34	38 – 43	29 – 34	24 – 28	20 – 23
<b>Fair</b>	38 – 41	35 – 38	29 – 33	24 – 27	32 – 37	25 – 28	20 – 23	14 – 19
<b>Poor</b>	33 – 37	30 – 34	24 – 28	19 – 23	27 – 31	20 – 24	14 – 19	10 – 13
<b>Very Poor</b>	< 33	< 30	< 24	< 19	< 27	< 20	< 14	< 10

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# **ATTACHMENT IV**

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## The Push-Up Assessment Protocol

## THE PUSH-UP ASSESSMENT PROTOCOL

The Push-Up Assessment is a measurement of how long a muscle or group of muscles can continue to function with their available strength over a period of time. The muscle groups used in the Push-Up Assessment are the chest, shoulder, arms, and back.

- The Push-Up Assessment is ***third*** in the sequence of events in the PTA.
- Candidates will perform as many repetitions as possible in **one-minute**.
- Candidates will assume the front-leaning up position with hands placed just outside the straight line down from the shoulders. The back, buttocks, and legs must be straight from head to heels. Candidate is looking straight ahead.
- Candidates will begin the Push-Up from the up (elbows fully extended) position. By bending the elbows, the candidate will lower the entire body until the tops of the upper arms, shoulders, and lower back are aligned and parallel to the ground (or equal to the distance of a clenched fist below the sternum). The candidate will then return to the up position by fully extending the elbows. This is one repetition.
- Candidates may only rest in the up position with elbows fully extended. Failure to be in the up position if choosing to rest will terminate the event.
- If the candidate does not maintain proper form (i.e., does not fully extend elbows, does not keep body straight from head to heels, does not lower close enough to ground, etc.) the repetition will not count.
- Breathe out during the “up” (positive) portion of the Push-Up, breathe in during the “down” (negative) portion of the Push-Up.
- **There will be no more than a five-minute recuperation period between the Push-Up Assessment and the 1.5-Mile Run Assessment.**



Starting and Rest Position



Down Position

**Push-Up Scoring Chart:**

AGES	MALES				FEMALES			
	20 – 29	30 – 39	40 – 49	50 – 59	20 – 29	30 – 39	40 – 49	50 – 59
<b>Excellent</b>	> 54	> 49	> 41	> 38	> 39	> 29	> 22	>22
<b>Good</b>	50 – 54	41 – 49	35 – 41	29 – 38	30 – 39	25 – 29	19 – 22	19 – 22
<b>Fair</b>	46 – 49	36 – 40	28 – 34	21 – 28	26 – 29	20 – 24	12 – 18	12 – 18
<b>Poor</b>	38 – 45	30 – 35	22 – 27	16 – 20	20 – 25	13 – 19	8 – 11	8 – 11
<b>Very Poor</b>	< 38	< 30	< 22	< 16	< 20	< 13	< 8	< 8

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# **ATTACHMENT V**

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## The 1.5-Mile Run Assessment Procedure and Protocol

## THE 1.5-MILE RUN ASSESSMENT PROCEDURE AND PROTOCOL

The 1.5-Mile Run Assessment is a measurement of aerobic fitness – how well an individual’s cardiovascular system is able to receive, transport and utilize oxygen.

- The 1.5-Mile Run Test is ***fourth*** and final in sequence of events in the PTA.
- The 1.5Mile Run is conducted on an indoor or outdoor track or another suitable running area that is measured so that exact distances are indicated. Test sites are relatively flat (no more than three percent grade), surfaces are either blacktop, asphalt, running or biking paths.
- Candidates should run 1.5 mile course as fast as possible.
- The total elapsed time that it takes the candidate to run the distance of 1.5 miles is recorded in minutes and seconds.
- **Candidates should refrain from any physical exertion and should not smoke or eat for two or three hours before the 1.5 mile assessment.**

### 1.5-Mile Run Scoring Chart

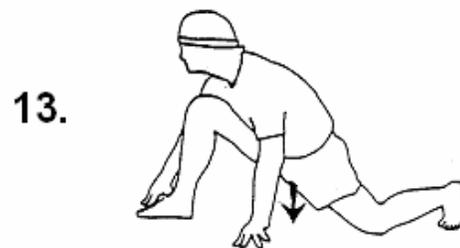
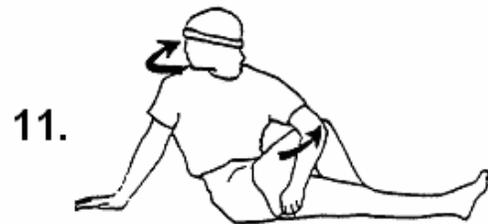
AGES	MALES				FEMALES			
	20 – 29	30 – 39	40 – 49	50 – 59	20 – 29	30 – 39	40 – 49	50 – 59
<b>Excellent</b>	< 10:17	< 10:48	< 11:45	< 12:52	< 12:51	< 13:43	<14:31	< 15:57
<b>Good</b>	10:17 – 11:41	10:48 – 12:20	11:45 – 13:14	12:52 – 14:24	12:51 – 14:24	13:43 – 15:08	14:31 – 15:57	15:57 – 16:58
<b>Fair</b>	11:42 – 12:51	12:21 – 13:36	13:15 – 14:29	14:25 – 15:26	14:25 – 15:26	15:09 – 15:57	15:58 – 16:58	16:59 – 17:54
<b>Poor</b>	12:52 – 14:13	13:37 – 14:52	14:30 – 15:41	15:27 – 16:43	15:27 – 16:33	15:58 – 17:14	16:59 – 18:00	17:55 – 18:49
<b>Very Poor</b>	> 14:13	> 14:52	> 15:41	> 16:43	> 16:33	> 17:14	> 18:00	> 18:49

# **ATTACHMENT VI**

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## Everyday Stretches

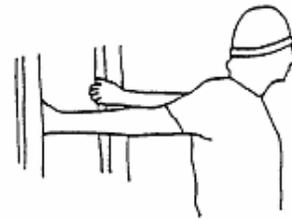
# EVERYDAY STRETCHES



13.



17.



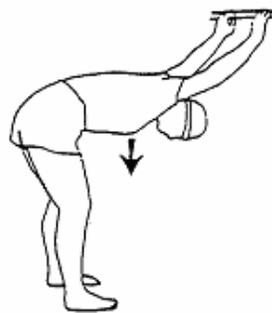
14.



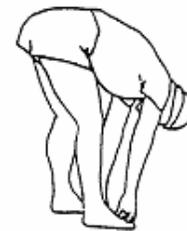
18.



15.



19.



16.



20.



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# **ATTACHMENT VII**

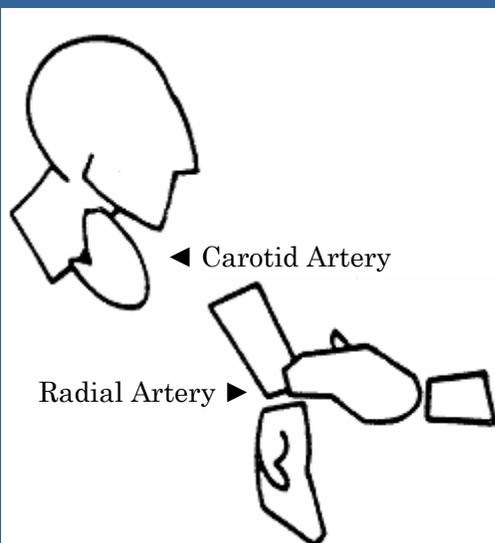
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## Monitoring Your Heart Rate

## MONITORING YOUR HEART RATE

The underlying principle behind monitoring your heart rate during exercise is simply that there's a direct relationship between how fast your heart is beating and how much exertion your body is experiencing. You can calculate your training heart rate by using the formula that appears below. By taking your pulse rate – at either your neck (carotid artery) or wrist (radial artery) – you'll be able to monitor the intensity of your workout. Heart rate monitoring is a relatively easy method of regulating your exercise session. The only piece of equipment you'll need is a watch or clock that has a second hand. If you'd rather not interrupt your workout to monitor your heart, you might consider using the talk test.

### How to Take Your Exercise Pulse Rate:



1. Locate your carotid artery with the tips of your fingers – it's in the front strip of muscle running vertically down your neck – or find your radial artery by pressing your fingers on the inside of your wrist just below your wrist bone.

2. Take your exercise pulse rate immediately after exercising by counting the number of times your heart beats in ten seconds.

3. Then Multiply your pulse by 6. For example, if your heart beats 30 times in 10 seconds, multiply 30 by 6; your exercise pulse would be 180.

If you're beginning a class or moving to a more advanced one, take your pulse every five or ten minutes. If it is high, then slow down. If low, then speed up a little to get training benefits.

### Training Heart Rate Calculations

See Utilizing Heart Rate in Training, Page 9.

# **ATTACHMENT VIII**

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## Overuse Syndromes / Overtraining

# OVERUSE SYNDROMES / OVERTRAINING

## Minor Exercise Problems

Prevention is the most effective way to deal with exercise problems, however, if you go too far or too fast too soon, forget to do your stretching, have serious muscle imbalances or weak feet, you are bound to have exercise problems now and then. When problems do arise treat the cause, not the symptom.

### Blisters

Foot blisters are really minor burns caused by friction. Blisters may be prevented by using good quality, properly fitted footwear (shoes and socks). At the first hint of a blister, cover the skin with some moleskin or a large bandage. Advanced cases can be treated by releasing the accumulated fluid, applying antiseptic, covering the area with gauze and a circle of moleskin.

### Muscle Soreness

Soreness may be due to microscopic tears in the muscle or connective tissues. Soreness usually develops some 24 hours after exercise. The pain and stiffness of muscle soreness can be minimized by engaging in mild stretching exercises and gradually increasing exercise intensity and duration. Warm muscle temperatures and massage also seem to reduce the discomfort of soreness.

### Muscle Cramps

A muscle cramp is a powerful involuntary contraction with no relaxation. Immediate relief comes when the muscle is stretched and massaged. It is wise to warm up sufficiently before vigorous effort and to attend to fluid replacement post exercise.

### Bone Bruises

Painful bruises on the bottoms of the feet (usually the heel) can be avoided by quality footwear, careful foot placement, and avoiding hard running surfaces. There is no instant cure once a bruise develops, however, ice may help to lessen discomfort and padding or cushioned inner soles may allow exercise in spite of the bruise.

### Ankle Sprains

A sprained ankle should be iced immediately. First aid includes rest, ice, compression (supports or tape), and elevation.

## Achilles Tendonitis

Sudden changes in training, such as repetitive overextension or increasing exercise intensity too rapidly may cause inflammation, tightness, and pain in the Achilles tendon during and after running. Treatment includes rest, ice and gradual stretching.

## Shin Splints

Pains on the front portion of the shin bone. They can be caused by lowered arches, irritated or inflamed membranes, muscle tears, muscle imbalances, and hairline fractures. Rest is the best cure, although taping and cushioned heel pads seem to help in some cases. Preventative measures include gradually increasing exercise intensity, regular stretching, avoidance of hard running surfaces, proper foot placement (heel-toe foot strike), plus occasional reversal of direction when running on a curved track.

## Knee Pain

Wearing shoes that do not fit well or are worn, suddenly intensifying or lengthening workouts without appropriate warm-ups and stretching exercises, as well as muscle imbalances or weaknesses in the quadriceps and hamstrings may increase the likelihood of knee injury and pain. First aid includes rest, ice and elevation.

## Are You Over Training?

Energy is a cycle of activity, fatigue, and recovery. When we fail to allow adequate time for recovery, we may begin to notice a decline in our level of performance – not only in sports but in everyday activities. Knowing the symptoms of “overtraining” can help you recognize when it’s time to take a break and give your body time to recuperate. If you recognize any of the following warning signs, take a few days off from your normal activity and give yourself a chance to recover your energy.

Note: Each of the symptoms listed may also be associated with other physical conditions unrelated to overtraining. If your symptoms persist after three days of recovery, call your doctor who can rule out other medical reasons for your problem.

### Warning Signs

- 
- Unexplained Weight Loss
  - Excessive Thirst
  - Persistent Muscle Soreness
  - Chronic Fatigue
  - Decline in Performance
  - Appetite Loss
  - More Infections Than Normal
  - Irritability
  - Changes in Sleep Patterns
  - In Women, Lack of Menstruation

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# **ATTACHMENT IX**

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Water and Exercise

## WATER AND EXERCISE

Water plays an essential role in the human energy system. During physical activity, only 25% of the energy generated by the body is turned into mechanical work – the balance is actually turned into heat. This heat must be removed by sweating to avoid dangerous increases in body temperature. When exercising intensely (especially in hot weather), you can easily lose more than a quart (upwards to three quarts) of water in an hour. Neglecting to compensate for such fluid loss can cause throbbing headaches, cramps, nausea, thickening of the blood, increased body temperature, dry skin, lethargy, nervousness, confusion, loss of coordination, a decline in the ability to sustain exercise, convulsions, heatstroke and death.

While thirst is the best indicator of the body's lack of water, it is not a good indicator of the immediate need for water since experts have observed that it is possible to lose up to two quarts of water before you are aware of being thirsty. Studies have also shown that thirst is quenched long before you have actually replaced the lost fluids. If fluid replacement is left entirely up to thirst it can take several days after prolonged exercise to reestablish water balance.

It is essential to drink adequate amounts of water BEFORE – DURING – and AFTER physical activity to prevent dehydration. Plain water is recommended by most experts since it is absorbed more efficiently than any other beverage.

Commercial sports drinks designed to replace electrolytes such as potassium and sodium and supply carbohydrates for energy simply are NOT necessary for the great majority of exercisers. The small amounts of electrolytes that are lost during exercise are easily replaced with a meal. (As for taking in extra carbohydrates during exercise, the practice appears to be beneficial only to people who exercise rigorously for more than 90 – 120 minutes at one time.)

### Tips to Ensure Adequate Water Balance

- Drink six to eight (eight ounce) glasses of plain, cool water daily. Cool water (40° - 50°) enters the digestive system faster than warm water.
- Drink water immediately upon waking up and an hour before or after a meal. Water will be absorbed better and will not dilute the food.
- Drink water before and after eating out. Extra water will flush out added salt and sugar in commercially prepared foods.
- Drink 16 – 20 ounces of water two hours BEFORE exercising and at least eight ounces of water 15 – 20 minutes BEFORE exercising. This helps to keep your body temperature from rising.

- Drink three to seven ounces of water every 10 – 20 minutes DURING prolonged exercise. Your body loses water quickly through sweat.
- Drink water AFTER exercise. For every one pound of body weight lost, drink 16 ounces of water.
- Soft drinks, fruit juices, coffee, tea, and alcohol should NOT be used to restore water levels. The sugars will slow down water absorption, while caffeine and alcohol will speed up water loss.

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# **ATTACHMENT X**

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## Environmental Concerns

## EXERCISE AND THE ENVIRONMENT

Environmental factors such as temperature, humidity, altitude and air pollution have profound effects on health and performance. Failure to consider these effects can lead to serious problems. On the other hand, it is entirely possible to adjust to the environment, enabling you to perform well and comfortably under a wide range of conditions.

### Acclimatization to the Cold

Avoid overdressing, wear layers of loose fitting, thin clothing that can be unzipped or removed as you warm up. Add about 20 degrees to the actual temperature when deciding how to dress. If it's 40 degrees on the thermometer, it will feel like 60 degrees once you get going.

Seventy percent of the body heat you lose during exercise escapes through the head and the hands. To prevent heat loss, wear a wool or synthetic hat as well as mittens or gloves.

On windy days, start out facing into the wind and return with the wind at your back. Since wind can penetrate clothes and remove the insulating layer of warm air around the body, wear a nylon windbreaker or suit to reduce the wind chill.

Water is important for temperature regulation and hydration in both warm and cold weather. Drink fluids before, during and after your workout.

Breathing cold air is not harmful to healthy people; you can't "freeze your lungs." However, it can be risky for those who suffer angina, asthma, or high blood pressure—they should check with a doctor before exercising in the cold. For such people, wearing a ski mask or scarf pulled loosely in front of the face may help warm up inhaled air.

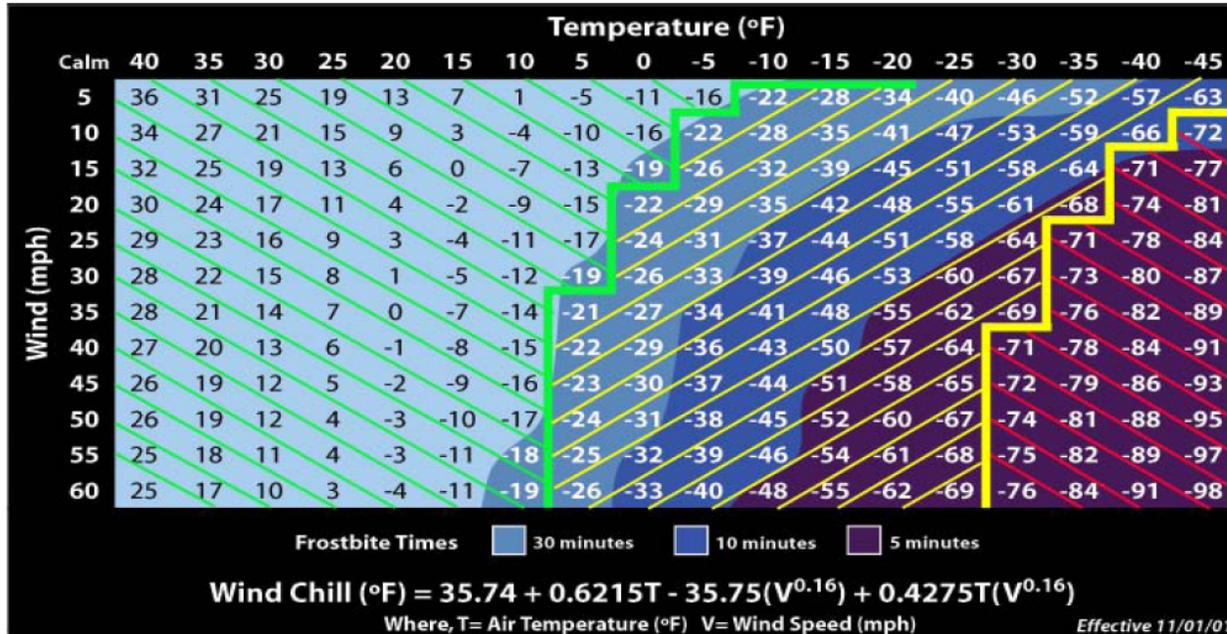
### Frostbite and Hypothermia

These are the two main dangers of exercising in the cold. Dressing properly and taking other precautions described here are your best safeguards. Be on guard for the numbness and white discoloration of frostbite—particularly on your hands, ears, toes, and face.

Hypothermia, which involves a dangerous drop in body temperature, is mostly a risk when you're out in very cold weather for many hours, especially if you are wet, injured, and/or not moving around enough to stay warm.

## Windchill: When Is It Dangerous?

On a windy day, air currents magnify heat loss as the warmer insulating air layer surrounding the body is continually replaced by cooler ambient air.



- **Little Danger**
- **Danger**
- **Great Danger**

## To Beat the Heat

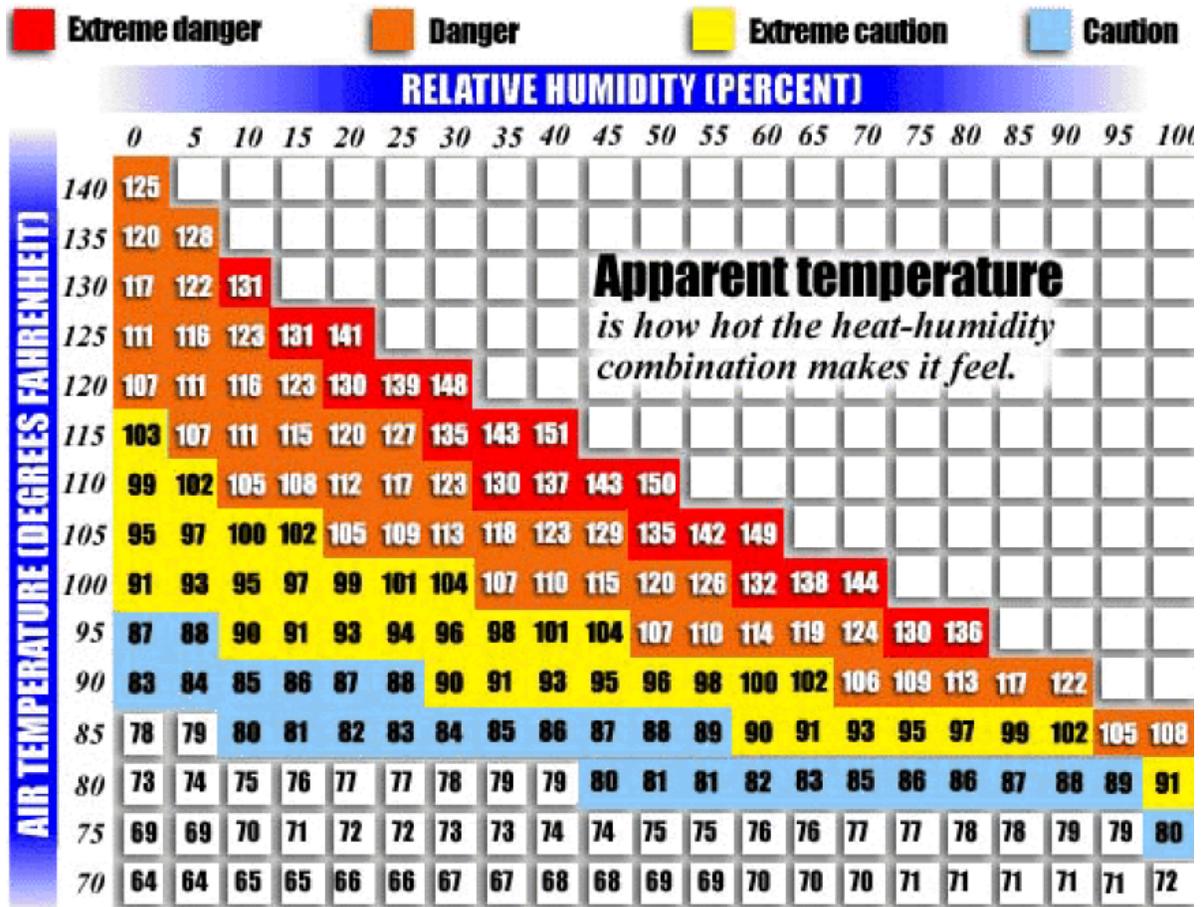
The weather affects us all very differently. Generally, temperature, humidity, direct sunlight, and exertion make us hot; wind evaporates our sweat and cools us off. Here are some special precautions when the temperatures soar:

- Drink plenty of water before, during and after exercise. Don't wait until you are thirsty.
- Exercise during the coolest parts of the day—early morning or evening.
- Monitor your heart rate frequently; it is a good indicator of heat load.
- Wear light-colored, lightweight, loose fitting clothing to improve evaporation and heat loss.
- Wear a light, ventilated hat or visor for sun protection and protective sunglasses.

Symptoms of heat exhaustion include weakness; rapid pulse; dizziness, headache; muscle cramps; general weakness; decreased sweating. If you experience any of these, stop exercising, move slowly to a cooler place (preferably in the shade), and drink lots of fluids.

### Humidity Chart

The Temperature and Humidity Chart indicates at which temperature and humidity conditions it is safe to exercise.



### Exercising at Altitudes

Elevations below 5,000 feet have little noticeable effect on healthy individuals. As you ascend to higher elevations, barometric pressure declines along with available levels of atmospheric oxygen. When this occurs, tissues are forced to operate with a reduced supply of oxygen. Therefore, upon ascent to higher altitudes, exercise intensity should be reduced. Higher elevations require about one week of acclimatization for each 1,000

feet above 5,000 feet. These adjustments reduce but never eliminate the effect of altitude on aerobic fitness. Endurance performances will always be reduced at altitude.

## **Air Pollution**

High levels of air pollution (ozone, carbon monoxide and sulfur dioxide) may necessitate a restriction of the intensity and duration of exercise, particularly for individuals with chronic pulmonary problems.

Ozone is the most worrisome air pollutant because it reacts chemically with body tissues, irritating the delicate lining of the lungs. Symptoms of exposure include head, cough, painful breathing, wheezing and inflammation of the nose and throat.

An Air Quality Index (AQI) of less than 50 indicates good or healthful air; 50-99 indicates moderate quality, not healthful for people with respiratory illness. An AQI of 100- 199 indicates unhealthy air in violation of federal ozone level, and an AQI of 200 or above indicates “very unhealthy” air that is dangerous to all individuals.

When the AQI exceeds 100, individuals are urged not to exercise outdoors during the peak pollution hours of 11 a.m. and 7 p.m.

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# **ATTACHMENT XI**

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Workout Charts

# EXERCISE LOG

A visual record of the efforts you have made toward getting into shape will keep you inspired. The more exercise you get, the more energy you will have. Print this exercise log to help keep track for three weeks. Beside "Level," write down High, Medium, or Light to correspond with how hard you worked. The type of activity will be what you did, and minutes is how long you spent at that activity.

## Exercise Log

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<i>Week One</i>							
Type of Activity							
Level							
Minutes							
<i>Week Two</i>							
Type of Activity							
Level							
Minutes							
<i>Week Three</i>							
Type of Activity							
Level							
Minutes							

**NOTES:** \_\_\_\_\_  
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