

CONNECTICUT FIREFIGHTERS HEALTH AND SAFETY CONSORTIUM



Self-Administered Physical Fitness Test

The Candidate Physical Abilities Test (CPAT) is **NOT** the standard by which a prospective firefighter should measure his or her ability; it is only considered to be a measure of one's ability to be physically trained. Below is a basic field-level self-test designed as an additional tool for preparation for the rigors of basic firefighter training:

1. RUNNING (cardiorespiratory or VO2 MAX)

Find a measured area to run a 1 ½ mile course and perform a timed run test. This would generally be six (6) laps around a standard outdoor ¼ mile high school or college track.

1 ½ mile run time: _____

2. PUSH-UPS

With only the hands and toes in contact with the floor, (or the "bent-knee position" for females if desired) a push-up is counted when the chest nearly touches the floor (the width of a clenched fist away from the ground), **and** there is a return to the start position **with arms fully extended**.

Push-Ups: _____

3. PULL-UPS

Grab the bar with an **overhand grip and opposing thumb**. A pull-up is counted when the chin is pulled **above the bar** and returned to the start position **with arms fully extended**.

Pull-Ups: _____

4. BODY COMPOSITION

(If you have access and ability to measure body fat, not weight)

Less than 20% body fat for men. Less than 25% body fat for females.

Yes No Unable to measure

Weight (if not able to measure fat): _____

5. FLEXIBILITY

Stand with feet 10" to 12" apart and legs perfectly straight. Bend at the waist toward the floor. Males should be able to touch the floor with the fingertips, and females should be able to touch the floor with the knuckles of the fist.

Yes No

6. CORE

(Low back, abdominal, and oblique muscle group)

Position a watch or clock for an easy view, and start in the **Plank Position**:

1. Hold **60 seconds**
2. Lift **Right Arm** – Hold **15 seconds**
3. Return right arm to the ground, lift **Left Arm** – Hold **15 seconds**
4. Return left arm, lift **Right Leg** – Hold **15 seconds**
5. Return right leg, lift **Left Leg** – Hold **15 seconds**
6. Return left leg, lift **Right Leg AND Left Arm** – Hold **15 seconds**
7. Return right leg and left arm, lift **Left Leg AND Right Arm** – Hold **15 seconds**
8. Return to the **Plank Position** with elbows on the ground – Hold **30 seconds**

Yes No



Connecticut Firefighters Physical Fitness Assessment and Preparation

Connecticut Firefighters Health and Safety Consortium

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Recruit Firefighter Physical Training and Baseline Fitness Standards

Of the four main areas of training and testing, **Work Capacity** has the most potential to undermine a Recruit's success. This is a very physically demanding profession, and it is unforgiving with age, infirmity, and weakness. The Candidate Physical Abilities Test (CPAT) is **NOT** the standard by which a prospective Recruit should measure his or her ability; it is only considered by our Recruit Firefighter Program to be a measure of one's ability to be physically trained. Not being physically prepared for the rigors of the profession always leads to poor academic performance (too tired to study), poor skill proficiency (too exhausted to concentrate and perform properly), and a poor attitude about the training program (too stressed to appreciate the importance of the program demands). These are minor in comparison, however, to how a lack of physical work capacity can contribute to injury and death on the training or fireground. Prospective recruits must have a strong understanding of the demands of the Recruit Firefighter Program in its entirety, and prepare to arrive as the occupational athlete that the profession requires.

On the following pages is an overview of Physical Training elements of the Recruit Firefighter Program's Health, Wellness, and Fitness approach, the Preparation Guide for this instructional area, and the Baseline Fitness Standards required upon arrival to the Recruit Firefighter Program:

Overview

Physical Training Program

The Connecticut Fire Academy's Recruit Firefighter Program Physical Training (PT) program is designed for firefighters and incorporates a range and continuum of job performance activities. It is a highly disciplined atmosphere that will prepare the recruit for both their academy and fire service responsibilities. The program begins with a general overview, in a classroom orientation fashion, and includes information pertaining to physical fitness, job stresses and behavioral health, physical health issues, and sports injuries. The initial orientation will also describe the base-line testing, the schedule, and how the program advances during the entire recruit PT program. From that point, all recruits will then be physically and mentally trained in a number ways throughout the program to approximate the knowledge, skills, and abilities required of firefighters in the modern fire service. We will create an understanding of the balance needed between the commonly understood fitness categories of Strength, Endurance, Cardio, Flexibility, and Body Composition in order to create optimum performance and injury prevention.

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Recruit Firefighter Program Physical Training Class Schedule

Daily Focus Areas

Mondays & Thursdays -- Predominantly Strength and Endurance

Tuesdays & Fridays -- Predominantly Cardio Respiratory

Wednesdays -- Functional Training or Aquatic program

Field-Level Testing (which is covered over a two day period)

1st week, 7th or 8th week (the middle of the schedule), and the 14th week

Daily Requirements

This is a highly structured, well-developed, and rigorous component of the Recruit Program that requires strong effort. PT classes are generally scheduled for 60 minutes. They begin at 0800 hours, except for the week of Night Fire Training. During the first three nights of that week, which is usually around week 8 or 9, PT classes will begin at 1500. Recruits will be notified in advance of any other changes to the schedule, changes in the start times, or adjustments to the length of the delivery of the material.

Recruits are required to be prepared before the start of each class. The training day will begin with a Personnel Accountability Report (PAR) and a readiness check. The PAR and Readiness Checks confirm that all recruits are accounted for, are clean shaven, have full water bottles, and have prepared and staged all needed equipment.

Preparation Guide

Advance preparation for the rigors of Physical Training is mandatory. It should be emphasized in the strongest of terms to all prospective Recruits that the Candidate Physical Abilities Test (CPAT) has historically not been a good indicator of potential success in the Connecticut Recruit Firefighter Program. The demands on the body and body's energy systems while wearing PPE and SCBA, carrying equipment, and performing more realistic firefighting operations is far more challenging than CPAT. In our view, CPAT is a better indicator of a readiness to progressively increase the physical training and preparation for the Recruit Firefighter Program. In addition, an athletic background, and/or a workout routine of limited dimensions will not be sufficient because of the manner in which the body utilizes the energy systems for work as a firefighter. We have seen many strength, endurance, and cardiorespiratory athletes who have still struggled with PT, because their training routines do not match the unique physical demands of firefighting. For that, we will train with higher intensity and fewer breaks than the lay person or civilian to mimic those firefighting requirements.

The subsequent increase in physical training prior to arrival should include all basic callisthenic body weight exercises with good form (push-ups, pull-ups, squats, lunges, etc.) in a series with jumping jacks and mountain climbers twice per week, as well as cardiorespiratory training like running, biking, and/or swimming at least three times per week. Running on the roadway has been especially helpful in preparing prior recruits to running on an asphalt surface in the Recruit Firefighter Program.

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Baseline Fitness Standards

1. RUNNING (cardiorespiratory or VO2 MAX)

1 ½ mile run in less than 13:30 according to the following script and process

The purpose of this information is to determine aerobic power and capacity. All prospective recruits should find a measured area to run a 1 ½ mile course and perform a run test. This would generally be six (6) laps around a standard outdoor ¼ mile high school or college track.

Once the test is completed, the run time should be factored into the following two-part formula to determine VO2 max, or maximum oxygen uptake. This is an indication of the body's ability to use oxygen as fuel for movement. The minimum standard for the fire service is a VO2 max of 42 ml/kg (so the entire chart is included for reference).

Step 1: MAXIMAL MET LEVEL BASED ON 1.5 MILE RUN TIME

<i>Minutes</i>	<i>Seconds</i>					
	<i>0</i>	<i>10</i>	<i>20</i>	<i>30</i>	<i>40</i>	<i>50</i>
<i>7:00</i>	22.44	21.95	21.47	21.00	20.54	20.10
<i>8:00</i>	19.67	19.24	18.83	18.43	18.04	17.67
<i>9:00</i>	17.30	16.94	16.59	16.25	15.92	15.60
<i>10:00</i>	15.28	14.98	14.69	14.40	14.12	13.85
<i>11:00</i>	13.59	13.33	13.08	12.84	12.61	12.38
<i>12:00</i>	12.16	11.95	11.74	11.54	11.34	11.15
<i>13:00</i>	10.96	10.78	10.61	10.44	10.27	10.11
<i>14:00</i>	9.95	9.80	9.65	9.50	9.36	9.22
<i>15:00</i>	9.08	8.95	8.82	8.69	8.56	8.44
<i>16:00</i>	8.31	8.19	8.07	7.95	7.83	7.72
<i>17:00</i>	7.60	7.48	7.37	7.25	7.13	7.02

This table is used to estimate VO2 max levels by multiplying the recorded metabolic equivalent value above by 3.5, and cross-referencing the normative charts below.

Example; time = 13:14 10.78 x 3.5 = 37.73 MET

Step 2: AEROBIC SCORES (VO2 max. – maximum oxygen uptake)

Male	<i>Age</i>			
	<i>20-29</i>	<i>30-39</i>	<i>40-49</i>	<i>50-59</i>
Superior	≥ 49	≥ 48	≥ 45	≥ 42
Excellent	45-48	43-47	41-44	38-41
Good	42-44	40-42	38-40	35-37
Fair	38-41	36-39	34-37	31-34
Poor	≤ 37	≤ 35	≤ 33	≤ 30

Female	<i>Age</i>			
	<i>20-29</i>	<i>30-39</i>	<i>40-49</i>	<i>50-59</i>
Superior	≥ 42	≥ 40	≥ 37	≥ 33
Excellent	38-41	36-39	33-36	30-32
Good	35-37	33-35	31-32	28-29
Fair	32-34	30-32	28-30	25-27
Poor	≤ 31	≤ 29	≤ 27	≤ 24

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2. PUSH-UPS

15 Push-Ups according to the following standard

Men will use the standard push-up position with only the hands and toes in contact with the floor, while woman can use the modified push-up position that is termed the “bent-knee position”. In either case, the hands should be positioned shoulder-width apart, while the back is straight and flat. A push-up is counted when the chest nearly touches the floor (the width of a fist away), **and** there is a return to the start position **with arms fully extended**. Subsequent push-ups in a set should follow a comfortable pace/rate that also ensures the best use of exercise technique and form.

The maximum number of push-ups is reached when there is a deviation from **the same good form and cadence (pace)** used in this description.

3. *PULL-UPS

3 consecutive Pull-Ups according to the following standard:

After a complete and thorough full-body warm-up routine, stand on a chair or platform under a chin bar and grab the bar with an **overhand grip and opposing thumb**. Hands should be positioned comfortably a little wider than shoulder-width apart where comfortable. A pull-up is counted when the chin is pulled **above the bar** and returned to the start position **with arms fully extended**.

The maximum number of pull-ups is reached when there is a deviation from **the same good form and cadence (pace)** used in this description.

***This is considered to be a difficult test requiring maximal effort. Do not attempt a test if you do not believe that you can do at least several pull-ups without risk of injury; train with modified exercises, including lat pull-downs, to advance the ability to safely perform pull-ups.**

4. BODY COMPOSITION

Less than 20% body fat for men. Less than 25% body fat for females.

Body fat measurements can be taken using several techniques or technologies. The Recruit Firefighter Program uses the Tanita Body Composition scales, which incorporate Bioelectrical Impedance technology. This is considered a “field-level” test.

General Body-fat Percentage Categories*:

Classification	Women	Men
Essential fat	10-13%	2-5%
Athletes	14-20%	6-13%
Fitness	21-24%	14-17%
Average	25-31%	18-24%
Obese	Above 31%	Above 24%

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5. FLEXIBILITY

Greater than 15” for males. Greater than 18” for females.

After a complete and thorough full-body warm-up routine, especially of the low back and hamstrings, remove shoes and sit at the sit-and-reach box. The heels and toes shall remain against the box with feet approximately 10” to 12” apart. One hand should be placed on top of the other, with the tips of the fingers aligned and against the push block. To perform the test, exhale and slowly lean forward by dropping the head toward or between the arms. Push the block slowly and cautiously as far as possible without bending the knees, stop and release **when at full extension using the form described above**. The score is the farthest point reached (to the nearest ¼”) on the following chart, after three trials:

***Although the Recruit Firefighter Program uses a “sit-and-reach” box for this “field-level” test, the following variation may be sufficient: Stand with feet 10” to 12” apart and legs perfectly straight. Bend at the waist toward the floor. Males should be able to touch the floor with the fingertips, and females should be able to touch the floor with the knuckles of the fist.**

Norms for trunk flexibility:

Age and Gender

Rating	% Rating	18-25		26-35		36-45		46-55	
		M	W	M	W	M	W	M	W
Excellent	100	28	29	28	28	28	28	26	27
	95	23	24	22	24	22	23	20	22
	90	22	24	21	23	21	22	19	21
Good	85	21	22	19	22	19	21	18	20
	80	20	22	19	21	19	21	17	20
	75	20	22	19	21	18	20	16	19
Above Average	70	19	21	17	20	17	19	15	18
	65	18	20	17	20	17	19	15	18
	60	18	20	17	20	16	18	14	17
Average	55	17	19	16	19	15	17	13	16
	50	17	19	15	19	15	17	13	16
	45	16	19	15	18	15	17	12	16
Below Average	40	15	18	14	17	13	16	11	14
	35	15	18	14	17	13	16	11	14
	30	14	17	13	16	13	15	10	14
Poor	25	13	16	12	15	11	14	9	13
	20	13	16	11	15	11	14	9	12
	15	12	16	11	14	9	13	8	12
Very Poor	10	11	14	9	13	7	12	6	10
	5	9	12	7	12	5	10	4	8
	0	2	7	2	5	1	4	1	3

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6. CORE

(Low back, abdominal and oblique muscle group)

Completion of the CORE Muscle Strength and Stability Test that follows.

The Core Muscle Strength & Stability Test

The objective of this evaluation is to monitor the development and improvements of an athlete's core strength and endurance over time. To prepare for the assessment you will need:

- Flat surface
- Mat
- Watch or clock with second counter

Conducting the Test

Position the watch or clock where you can easily see it:

1. Start in the **Plank position** with elbows on the ground – Hold **60 seconds**
2. Lift **Right arm** – Hold **15 seconds**
3. Return right arm, lift **Left arm** – Hold **15 seconds**
4. Return left arm, lift **Right leg** – Hold **15 seconds**
5. Return right leg, lift **Left leg** – Hold **15 seconds**
6. Return left leg, lift **Right leg and Left arm** – Hold **15 seconds**
7. Return right leg and left arm, lift **Left leg and Right arm** – Hold **15 seconds**
8. Return to the plank position with elbows on the ground – Hold **30 seconds**

Results

➤ **Good Core Strength**

If you can complete the test fully, you have good core strength.

➤ **Poor Core Strength**

If you cannot complete the test fully, your core strength needs improvement. Try to remember where in the test that you needed to stop. Poor core strength results in unnecessary torso movement and swaying during all other athletic movements. This results in wasted energy and poor biomechanics. Good core strength indicates that the athlete can move with high efficiency.

If you are unable to complete the test, practice the routine three or four times each week until you improve.

By comparing your results over time, you will note improvements or declines in core strength.

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Hydration, Nutrition, and Rest for Firefighters

Quick General Tips

Eating, drinking, and resting for performance in our profession, which would be all-inclusive for those times related to maintaining a state of readiness, training, preparation, and response, should be considered the equivalent of those required for athletes. They should ideally become a part of a lifestyle that considers the following general recommendations to ensure your safety and overall peak performance in what we do, and in how we recover to perform again:

Hydration

- Drink cool water (50-59 degrees Fahrenheit) from a clean individual container before, during, and after physical labor. Anticipate all conditions where it is reasonable to expect increased demands for proper hydration, like: high temperatures, high humidity, direct sunlight, the wearing of PPE, and difficult or long work periods.
- Drink ½ your bodyweight in ounces of fluid per day, or at least eight (8) eight (8) ounce glasses (which is the minimum recommendation for sedentary workers).
- Drink 2-7 ounces every 15 to 20 minutes throughout the day, where possible, but be more deliberate during times of high activity of any sort.
- Drink 16 ounces 2 hours prior to known physical activity in preparation for increased hydration demands.
- Electrolyte beverages are beneficial to most athletes, particularly with strenuous activities and those that last longer than one hour, but be sure to experiment first with brand, quantity, flavor, and positive effect.
- Use caffeine and caffeinated beverages and alcohol in moderation, as they are diuretics which can further deplete the body of fluid.

Nutrition

- Eat frequent (5-6) well-balanced meals (with the macronutrient balance somewhere in the 40/30/30 range).
- Eliminate alcohol and caffeinated beverages, and fried/salty/greasy foods at least 12 hours prior to known events or activities.
- Eat light meals with lower saturated fat, higher carbohydrates, and lean protein sources 2-4 hours before the event or activity, and maintain hydration.
- Eat a small, light snack 1-2 hours before the event or activity that might consist of yogurt, power bar, fruit/health smoothie, banana, sports drink, and maintain hydration.
- Do not eat 1 hour or less before the event or activity. Drink liquids only, especially those that will contribute to peak performance.
- The closer to the event or activity, the smaller the meal or snack should be.

Sleep/Rest

Getting what would be considered adequate sleep is highly individual, however, know that lack of proper rest and recovery can be extremely detrimental to performance and recovery. Adults generally need between 7 & 9 hours of continuous sleep. Be serious about how much rest and sleep that you need, and how to reduce stress in your life for optimum performance and recovery.

** Information accumulated from OSHA, NIOSH, American Conference of Governmental Industrial Hygienists (ACGIH), local experts, and other sources not meant to replace information obtained from a Primary Care Physician (PCP) or personal Registered Dietician.*

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