

Conduct monthly physical fitness evaluations for members on weight probation in accordance with the instruction in the following pages. Do not conduct the test until the member has been cleared by medical. Physical fitness evaluation shall consist of at least:

- (1) 1.5 mile run or 1 mile walk test max VO₂;
- (2) Push up test; and;
- (3) Curl up test.

APPENDIX E. FITNESS ASSESSMENT PROTOCOLS AND PROCEDURES

- A. Purpose: These protocols should be used to administer all fitness tests and assessments throughout the Coast Guard including the Deployable Operations Group, Law Enforcement Teams, Maritime Law Enforcement Academy and other training schools where fitness tests are required. Protocols are taken from the Cooper Institute's Physical Fitness Assessments and Norms, 2009.
- B. Fitness Norms: The norm charts included in this appendix are a representation of how individuals compare to one with regard to performance on the physical fitness tests. The Cooper Institute has one of the largest and most valid data bases in the world with respect to fitness norms. There are two types of norms that the Coast Guard uses for fitness testing:
1. Age and Gender Norms: Age and gender norms are a representation of how individuals in a specific age and gender group compare to one another with regard to performance on physical fitness tests. Age and gender norms are acceptable for use in all Coast Guard fitness tests and assessments except Tier 1 DOG Fitness Standards.
 2. Absolute Norms: Absolute norms are minimal scores or "cut-points" that have been determined in law enforcement validation studies as the fitness standard that must be attained by everyone regardless of age, gender or handicapping conditions for the person to be considered fit for duty. Absolute Norm tables are not depicted in this appendix but can be found in the manuals that require absolute norm standards, such as Reference (g).
- C. Procedure and Order of Testing: Following a standardized protocol for order of testing ensures that every fitness assessment is delivered fairly every time. In the case of mandatory fitness tests, where members are required to pass a battery of tests for selection, assignment or maintenance of a unit fitness standard, the member must pass all components of the fitness test at one time. If one component of the test is failed, the entire test battery must be repeated during re-assessment, not just the portion of the test that was failed. According to the National Strength and Conditioning Association, a battery of fitness tests should occur in the following order:
1. Non-Fatiguing Tests (height/weight measurements, body fat tests, vertical jump), then rest for two minutes
 2. Muscular Strength (sit ups, 1 repetition maximum bench press), then rest for 5 to 10 minutes
 3. Speed (300 meter run), then rest for 5 to 10 minutes
 4. Muscular Endurance (push up), then rest for 5 to 15 minutes
 5. Cardiovascular Endurance (1.5 mile run), then cool down for 5 minutes
 6. Flexibility
- D. 1.5 Mile Run Test.
1. Test Description. This is an aerobic fitness test designed for young people and runners. The runner covers a distance of 1.5 miles in as short a time as possible without undue strain. Aerobic capacity is determined from total elapsed time.

2. Required Equipment.
 - a. Stop watch to time the run to the nearest second.
 - b. An accurately measured, flat, 1.5 mile course or ¼ mile track (6 laps = 1.5 miles).
3. Test Guidelines: The following are some guidelines to be followed in preparation for the 1.5 mile run test.
 - a. Members should not eat a heavy meal or smoke for at least 2 to 3 hours prior to the test.
 - b. Members should warm up and stretch thoroughly prior to the test.
 - c. Members should practice pacing themselves prior to the test.
 - d. Members may attempt to run too fast early in the run and become fatigued prematurely. Running partners may accompany members around the track to help pace them.
4. Test Administration.
 - a. Participants should be in good health and currently used to running, not beginners. Before testing, verify that the pre-test screening items have been completed (i.e., PAR Q). The tester should have participants warm-up and cool down after the run.
 - b. Participants should be dressed in clothes ready to exercise, preferably exercise shorts or pants and running shoes.
 - c. Instruct participants to:
 - (1) Warm up by walking at a moderate pace for 2 to 5 minutes.
 - (2) The participant runs 1.5 miles as fast as possible. If a 440 yard track is used, 6 laps must be completed using the inside lane (lane 1). If using a 400 meter track, an additional 15 yards must be run after the 6 laps are completed.
 - (3) During the administration of the test, the participants can be informed of their lap times. Finish times should be called out and recorded.
 - (4) Upon test completion, a mandatory cool down period is enforced. The participants should walk slowly for about five minutes immediately after the run to prevent pooling of blood in the lower extremities.
 - (5) If participants experience any pain or severe shortness of breath or other abnormal signs, they should walk or stop and seek medical attention if necessary.

1 1.5 Mile Norms for Men and Women: These tables represent the Cooper Institute's Norms for completion of a 1.5 mile run for civilian populations. These tables do not represent the pass/fail norms for any specific Coast Guard qualification requirement. Those norms can be found in those respective manuals (list manuals which have this requirement).

Age (years)	20 – 29	30 – 39	40 – 49	50 – 59	60+
Superior	< 9:17	< 9:33	< 9:51	< 10:37	< 11:26
Excellent	9:18-10:09	9:34 – 10:46	9:52 – 11:15	10:28 – 12:08	11:27 – 13:23
Good	10:10-11:29	10:47 – 11:54	11:16 – 12:24	12:09 – 13:35	13:24– 15:04
Fair	11:30-12:38	11:55 – 12:58	12:25 – 13:50	13:36– 15:06	15:21 – 16:46
Poor	12:39-14:00	12:59 – 14:34	13:51 – 15:24	15:07 – 16:58	16:46 – 19:10
Very Poor	> 14:00	> 14:34	> 15:24	>16:58	>19:10

Table E-1: 1.5 Mile Norms for Men (Minutes: Seconds)

Age (years)	20 – 29	30 – 39	40 – 49	50 – 59	60+
Superior	<10:28	< 11:00	<11:33	<12:53	<14:05
Excellent	10:29 – 11:58	11:01 – 12:24	11:34 – 13:23	12:54 – 14:34	14:06– 16:33
Good	11:59 – 13:24	12:25 – 14:08	13:24 – 14:53	14:35 – 16:35	16:34 – 18:27
Fair	13:25 – 14:50	14:09 – 15:43	14:54 – 16:31	16:36 – 18:18	18:28–20:16
Poor	14:51– 16:46	15:43 – 17:38	16:32 – 18:37	18:19 – 20:44	20:16 – 22:52
Very Poor	>16:46	> 17:38	>18:37	>20:44	>22:52

Table E-2: 1.5 Mile Norms for Women (Minutes: Seconds)

E. One Mile Walk Test.

1. Test Administration. The purpose of this test is to estimate cardiorespiratory fitness level (VO₂ max).
2. An accurately measured course of exactly one mile is necessary. A ¼ mile running track is ideal. A pulse rate monitor device is required for this test. Clients are instructed to walk one mile *as fast as possible*. Running or jogging is *not* allowed. *Immediately upon completion* of the one mile walk, the pulse rate should be recorded from the pulse rate monitor. Do *not* use a ten second pulse check, this will invalidate the test. After completing the test, the client should continue walking slowly for 5 minutes to cool down.
3. Calculation of Estimated VO₂ max. Knowing the client's weight (WT), age, sex, one mile walk time (T) and one mile walk heart rate (HR), a good estimate of VO₂ max can be obtained by using the following formula:

$$\text{VO}_2 \text{ max} = 132.853 - (0.0769 \times \text{WT}) - (0.3877 \times \text{AGE}) + (6.3150 \times \text{SEX}) - (3.2649 \times \text{T}) - (0.1565 \times \text{HR})$$

Where:

WT = Weight in pounds AGE = Age in years SEX = 0 for female, 1 for male

T = Walk time in minutes and seconds, to the nearest tenth of a minute
(seconds divided by 60 = tenths of a minute)

HR = Heart rate in beats/minute at the end of the walk

Compare with norms for VO₂ max in this section to determine percentile ranking and fitness category.

Source: Kline, et. Al. Estimation of VO₂ max from a one mile track walk. *Medicine and Science in Sports and Exercise* 19(3):253-259, 1987.

Age (years)	20 – 29	30 – 39	40 – 49	50 – 59	60+
Superior	55.5	54.1	52.5	49.0	45.7
Excellent	55.4-51.1	54.0 – 48.3	52.4 – 46.4	48.9 – 43.3	45.6 – 39.6
Good	51.0-45.6	48.2 – 44.1	46.3 – 42.4	43.2 – 39.0	39.5– 35.6
Fair	45.5-41.7	44.0 – 40.7	42.3 – 38.4	38.9– 35.5	35.4 – 32.3
Poor	41.6-38.0	40.6 – 36.7	38.3 – 34.8	35.4 – 32.0	32.2 – 28.7
Very Poor	< 38.0	< 36.7	< 34.8	<32.0	<28.7

Table E-3: 1 Mile Walk Test Male Norms Max VO₂

Age (years)	20 – 29	30 – 39	40 – 49	50 – 59	60+
Superior	49.6	47.4	45.3	46.1	41.0
Excellent	49.5 – 43.9	47.3 – 42.4	45.2 – 39.6	46.0 – 36.7	39.9– 36.7
Good	43.8 – 39.5	42.3 – 37.7	39.5 – 35.9	36.6 – 32.6	36.6 – 32.6
Fair	39.4 – 36.1.	37.6 – 34.2	35.8 – 32.8	32.5 – 29.9	32.5–29.9
Poor	36.0– 32.3	34.1 – 30.9	32.7– 29.4	29.8 – 26.8	29.8 – 26.8
Very Poor	<32.3	< 30.9	<29.4	<26.8	<26.8

Table E-4: 1 Mile Walk Test Female Norms Max VO₂

	Men Under 40	Men Over 40	Women Under 40	Women Over 40
Excellent	13:00 or less	14:00 or less	13:30 or less	14:30 or less
Good	13:01-15:30	14:01-16:30	13:31-16:00	14:31-17:00
Average	15:31-18:00	16:31-19:00	16:01-18:30	17:01-19:30
Below Average	18:01-19:30	19:01-21:30	18:31-20:00	19:31-22:00
Low	19:31 or more	21:31 or more	20:01 or more	22:01 or more

Table E-5: 1 Mile Walk Text Norms in Minutes

F. Push Up Test.

1. Test Description: This test measures muscular endurance of the upper body (anterior deltoid, pectoralis major, triceps). All fitness assessments should follow the protocol below for the push up test with these exceptions:
 - a. Personal Wellness Profile Assessment male participants should use the maximum push up test. Follow the same protocol as the one minute push up test but continue the test until fatigue or until proper form can no longer be maintained. No resting is allowed.

- b. Personal Wellness Profile Assessment female participants should use the maximum push-up test in the modified position. 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. Continue the test until fatigue or until proper form can no longer be maintained. No resting is allowed.
2. Required Equipment:
- a. Gym mat, or suitable flooring.
 - b. Stop watch or timing device.
3. Test Administration:
- a. Have the member place his/her hands slightly wider than shoulder width apart, with fingers pointing forward.
 - b. Starting from the up position (elbows extended), the subject must keep the back straight at all times and lower the body to the floor until the upper arms are at a 90 degree angle.
 - c. Subject then returns to the starting position. This is one repetition.
 - d. Resting can only be done in the up position. Both hands must remain in contact with the floor at all times. Exception: the push-up test protocol for the PWP does not allow any resting and does not have a time limit. The test is terminated when the participant can no longer maintain proper form or until fatigue.
 - e. The total number of correct pushups completed is recorded as the score.

<u>Men</u>	20 – 29 yrs	30 – 39yrs	40 – 49 yrs	50 – 59 yrs	60 + yrs
Superior	62+	52+	40 +	39 +	28 +
Excellent	47 – 61	39 – 51	30 – 39	25 – 38	23 – 27
Good	37 – 46	30 – 38	24 – 29	19 – 24	18 – 22
Fair	29 – 36	24 – 29	18 – 23	13 – 18	10 – 17
Poor	22 – 28	17 – 23	11 – 17	9 – 12	6 – 9
Very Poor	13 – 21	9 – 16	5 – 10	3 – 8	2 – 5

TableE-6: Push Up Test Norms for Men 1 Minute Test

<u>Women</u>	20 – 29 yrs	30 – 39 yrs	40 – 49 yrs
Superior	42+	39+	20 +
Excellent	28-41	23-38	15-20
Good	21-27	15-22	13-14
Fair	15-20	11-14	9-12
Poor	10-14	8-10	6-8
Very Poor	3 – 9	1-7	0-5

Table E-7: Push Up Test Norms for Women 1 Minute Test

** Coopers doesn't have full body push up norms for women over 50.

Women	20 – 29 yrs	30 – 39 yrs	40 – 49 yrs	50 – 59 yrs	60 + yrs
Superior	45 +	39 +	33 +	28 +	20 +
Excellent	36 – 44	31 – 38	24 – 32	21 – 27	15 -19
Good	30 – 35	24 – 30	18 – 23	17 – 20	12 – 14
Fair	23 – 29	19 – 23	13 – 17	12 – 16	5 – 11
Poor	17 – 22	11 -18	6 – 12	6 – 11	2 – 4
Very Poor	< 16	< 11	< 6	< 6	< 2

Table E-8: Push Up Test Norms for Modified Push Up

G. Sit-Up Test.

1. Test Description. This is an easily administered test for measuring abdominal strength/endurance. The subject does as many bent knee sit-ups as possible in one minute.
2. Required Equipment.
 - a. Gym mat or suitable flooring.
 - b. Stop watch or watch with a second hand.
3. Test Administration.
 - a. Test subject should be screened for lower back impairment or pain. Persons suffering back pain or high, uncontrolled blood pressure, should not do this test.
 - b. Be sure participants are well instructed in the proper technique. Describe and if needed, demonstrate the correct technique. They may want to practice once or twice before beginning the test.
 - c. Instruct the subjects to:
 - (1) Lie on their back on a mat, knees bent at a 90 degree angle, feet shoulder width apart with heels on the floor and hands cupped behind the ears. Exemption: for the PWP, arms are crossed in front of the body with fingertips on shoulders.
 - (2) A partner holds the feet down firmly.
 - (3) The subject then performs as many correct sit ups as possible in one minute.

- (4) In the up position, the individual should touch elbows to knees and then return until the shoulder blades touch the floor.
- (5) Breathing should be as normal as possible, making sure the subject does not hold their breath.
- (6) Neck remains in the neutral position. Do not pull on the head or neck.

Age (years)	<20	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69
Superior	62+	55+	51+	47+	43+	39+
Excellent	51 – 61	47 – 54	43 – 50	39 – 46	35 – 42	30 – 38
Good	47 – 50	42 – 46	39 – 42	34 – 38	28 – 34	22 – 29
Fair	41 – 46	38 – 41	35 – 38	29 – 33	24 – 27	19 – 21
Poor	36 – 40	33 – 37	30 – 34	24 – 28	19 – 23	15 – 18
Very Poor	<36	<33	<30	<24	<19	<15

Table E-9: Sit-Up Norms for Men 1 Minute

Age (years)	<20	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69
Superior	55 +	51 +	42 +	38 +	30+	28 +
Excellent	46 – 54	44 – 50	35 – 41	29 – 37	24 – 29	17 – 27
Good	36 – 45	38 – 43	29 – 34	24 – 28	20 – 23	11 – 16
Fair	32 – 35	32 – 37	25 – 28	20 – 23	14 – 19	6 – 10
Poor	28 – 31	24 – 31	20 – 24	14 – 19	10 – 13	3 – 5
Very Poor	< 28	< 24	<20	<14	<10	<3

Table E-10: Sit-Up Norms for Women 1 Minute

H. Abdominal Curl Ups.

1. Test Description. The abdominal curl-up is an alternative to sit-ups when testing for abdominal strength/endurance. The advantages suggested for this test is that it puts less strain on the back, better isolates the abdominal muscles and minimizes the hip flexors.
2. Required Equipment.
 - a. Gym mat.
 - b. Ruler.
 - c. Small blocks for fingers to touch in order to signal person when they have moved hands 3 inches forward.
 - d. Stop watch or watch with second hand.
3. Test Administration.
 - a. Test subject should be screened for lower back pain. People suffering from back pain or uncontrolled high blood pressure should not do this test.
 - b. Instruct subject to:
 - (1) Lie on their back on a mat with knees bent, feet shoulder width apart.

- (2) Arms are fully extended by the sides, palms down with fingers extended. A piece of masking tape is placed perpendicular to the fingertips of each hand such that the fingertips are at the front edge of the tape. Another piece of tape is placed parallel to and three inches in front of the tape at the fingertips.
 - (3) While holding participant’s feet, participant must move both hands along the floor a distance of three inches by flexing the trunk (fingertips are moving from one piece of tape to the next). Upon returning to the floor (shoulder blades touching the floor), one repetition is counted. (When conducting a PWP the feet should not be held).
 - (4) Instruct the subject to do as many curl-ups in one minute as they can without undue strain and while breathing as normally as possible.
4. Test Scores for the Curl-up. The Cooper Institute does not have norms for the one minute curl up test, nor are there published norms derived from large population studies. The norms below are based on a study published in the Medicine and Science in Sports and Exercise, Volume 13, pages 54-59, 1981. The scores listed above are based on preliminary research and should be used only as a general guideline. Persons can also use their first time test scores as a baseline by which to show future change and improvement with training.

Age	18-29		30-39		40-49		50-59		60+	
Sex	F	M	F	M	F	M	F	M	F	M
Advanced	>45	>50	>40	>45	>35	>40	>30	>35	>25	>30
Intermediate	25-45	30-50	20-40	22-45	18-35	21-40	12-30	18-35	11-25	15-30
Beginner	<25	<30	<20	<22	<18	<21	<12	<18	<11	<15

Table E-11: Test Scores for the Curl-up

I. Flexibility: Sit and Reach Test.

- 1. Test Description. This test measures flexibility of the hamstrings and low back. Flexibility is not considered a good predictor of overall fitness and is not recommended for inclusion in testing for qualification or selection to a specific team or assignment.
- 2. Required Equipment.
 - a. Gym mat.
 - b. Flexibility box, or 12” high box and yardstick on box with 15” mark at the edge.
- 3. Test Administration.
 - a. Test subject should be screened for lower back impairment or pain. Persons suffering back pain should not do this test.
 - b. Be sure participants are well instructed in the proper technique. Describe and if needed, demonstrate the correct technique as follows:
 - (1) Have subject warm up with slow stretching movements before attempting this test. An example of a good warm up stretch is a sitting toe touch.
 - (2) Remove shoes.

- (3) The feet are placed squarely against the box with the feet no wider than eight inches apart. Toes are pointed directly toward the ceiling.
- (4) The knees should remain extended throughout the test.
- (5) The hands are placed one hand on top of the other, fingertips even.
- (6) The yardstick is set on the box such that the 15” mark is flush with the edge of the box.
- (7) The subject leans forward without lunging or bobbing and reaches as far down the yard stick as possible. The hands must stay together and even and the stretch must be held for one second. Neck should remain in the neutral position.
- (8) Record the reach to the nearest ¼ inch.
- (9) Three trials are allowed; the best of the three trials is recorded. Exhaling on the reach is recommended.
- (10) NOTE: If the flexibility test is used for the PWP, subtract 4.75 from the score and enter this number into the PWP questionnaire.

Age (years)	<20	20 – 29	30 – 39	40 – 49	50 – 59	60+
Superior	>=23.4	>=23	>=22	>=21.3	>=20.5	>=20
Excellent	21.7-22.6	20.5-21.8	19.5-21	18.5-20	17.5-19	17.3-19
Good	19-21.4	18.5-20	17.5-19	16.3-18	15.5-17	14.5-16.5
Fair	16.5-18.7	16.5-18	15.5-17	14.3-16	13.3-15	12.5-14
Poor	13.2-16	14.4-16	13-15	12-14	10.5-12.5	10-12
Very Poor	<13.2	<14.4	<13	<12	<10.5	<10

TableE-12: Sit and Reach Flexibility Norms for Men (inches)

Age (years)	<20	20 – 29	30 – 39	40 – 49	50 – 59	60+
Superior	>=24.3	>=24.5	>=24	>=22.8	>=23	>=23
Excellent	22.5-24.3	22.5-23.8	21.5-22.5	20.5-21.5	20.3-21.5	19-21.8
Good	21.5-22.3	20.5-22	20-21	19-20	18.5-20	17-18
Fair	20.5-21.3	19.3-20.3	18.3-19.5	17.3-18.5	16.8-18	15.5-17
Poor	18.5-20	17-19	16.5-17.8	15-17	14.8-16	13-15.2
Very Poor	<18.5	<17	<16.5	<15	<14.8	<13

Table E-13: Sit and Reach Flexibility Norms for Women (inches)

J. Vertical Jump Test

1. Test Description: This test is a measure of jumping or explosive power.
2. Required Equipment:
 - a. Yardstick taped to a smooth wall, and
 - b. Chalk dust or chalk for marking extension when jumping

3. Test Administration:

- a. Subject stands with one side toward the wall and reaches up as high as possible to mark his/her standard reach.
- b. Subject jumps as high as possible and mark the spot on the wall above his/her standard reach mark. Prior to jump, one foot must remain stationary on the floor.
- c. Score is the total inches, to the nearest ½ inch.
- d. The best of three trials is the score.

Age (years)	20-29	30-39	40-49	50-59
Superior	>26.5	>25	>22	>21
Excellent	24-26.5	22-24.5	19-21.5	17-20.5
Good	21.5-23.5	20-21.5	17-18.5	15-16.5
Fair	20-21	18.6-19.5	15.5-16.5	13.5-14.5
Poor	17.5-19.5	16.5-18.5	14.0-15.0	12-13
Very Poor	< 17.0	<16.0	<13.5	<12

Table E-14: Vertical Jump Test Norms Men

Age (years)	20-29	30-39	40-49
Superior	>18.5	>17.0	>13.5
Excellent	17.5-18.0	15-16.5	13-13.5
Good	16.0-17.0	13.5-14.5	11.5-12.5
Fair	14.0-15.5	12-13	9.5-11
Poor	12.5-13.5	11-12	7.5-9
Very Poor	< 12	<11	<7.5

Table E-15: Vertical Jump Test Norms WomenK. 300 Meter Run Test.

1. Test Description: This test is an assessment of anaerobic power.
2. Required Equipment:
 - a. 400 meter running track, or
 - b. Any measure 300 meter flat surface that provides good traction
3. Test Administration:
 - a. Allow subject to warm up and stretch before beginning test.
 - b. If using a 400 meter track, participant runs $\frac{3}{4}$ of 1 lap (inside lane) at maximum level of effort.
 - c. Time used to complete distance is recorded in seconds.
 - d. Participant should walk for 3 to 5 minutes immediately following test to cool down. This is an important prevention consideration.

Age (years)	20-29	30-39	40-49	50-59
Superior	<46	<46	<52	<58
Excellent	48-50	47-51	53-57	59-66.4
Good	51-54	52-55	58-64	67-74
Fair	55-59	56-59	65-72	75-83
Poor	60-66	60-68	73-83	84-95
Very Poor	>66	>68	>83	>95

Table E-16: 300 Meter Run Norms Males

Age (years)	20-29	30-39	40-49
Superior	<54.3	<56.5	<65
Excellent	56-58.3	60-66	66-72
Good	59.7-61	66.5-71	72-79
Fair	62.7-71	72-79	80.5-94
Poor	74.5-78	80.5-86	101.8-110
Very Poor	>78	>86	>110

Table E-17: 300 Meter Run Norms Females

** Coopers does not have 300 meter run norms for women over 50.

