

SPOKANE COUNTY FIRE DISTRICT 8

Standard Operating Procedures

20.02.05 ANNUAL FITNESS ASSESSMENT



Adopted: 12/20/16
Reviewed: 11/01/18
Revised: 05/08/18

Approved:

A handwritten signature in black ink, appearing to read "Tony Fisher", is written over a horizontal line.

Purpose: Annual fitness assessments are offered to District personnel to inform members of their current fitness level, identify areas of possible improvement, compare results of previous years (if available), and suggest an exercise program.

References: Fire Service Joint Labor Management Wellness-Fitness Initiative

Procedure:

The annual fitness assessment is non-mandatory, non-punitive, and shall be considered as confidential pursuant to RCW 42.56.360(1)(j) and RCW 42.04.362. The goal of these evaluations is solely for personal fitness improvement. There are no standards mandated by the Fire District for any of the areas tested. The fitness assessment test body composition, aerobic capacity, muscular power, muscular endurance, and flexibility.

1. **Safety and Injury Prevention:** To ensure maximum safety, personnel must be screened for medical contraindications and instructed in proper technique prior to performing any of the fitness evaluations.
 - a) Assessments must be conducted by a certified Peer Fitness Trainer.
 - b) Personnel must complete a health screening including the Physical Activity Readiness Questionnaire (PAR-Q) and the Exercise History and Attitude Questionnaire.

2. **Fitness Assessment Components:** All assessments will be administered according to the recommendations set forth in the Fire Service Joint Labor Management Wellness-Fitness Initiative (WFI). The assessments are sequenced to minimize the effect of fatigue on subsequent performance and to mitigate injury. Detailed procedures for administration are found in Wellness-Fitness Initiative Appendix A – Fitness Protocols:
 - a) **Body Composition:**
 - i. Participant's height and weight will be measured, and used to calculate Body Mass Index (BMI).
 - ii. Body fat percentage will be estimated using a six site skinfold measurement.
 - b) **Aerobic Capacity:**
 - i. The WFI treadmill assessment will be used to test participant's aerobic capacity.
 - ii. This is a submaximal test that is used to estimate a person's maximal aerobic capacity, expressed as VO_2 max.
 - c) **Muscular Strength:**
 - i. Isometric test will be conducted to determine maximum hand, arm, and leg strength.

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- d) Muscular Endurance:
 - i. The prone static plank and push-ups are used to measure both static and dynamic endurance.

- e) Flexibility:
 - i. The modified sit and reach test is used to assess gross posterior muscle flexibility.

3. Assessment Results:

- a) Results are to be recorded on the Fitness Assessment Worksheet.
- b) The Peer Fitness Trainer will review results with the employee and, when available, compare them with past performance.
- c) The PFT may also offer to develop an exercise program to address deficiencies.
- d) Results are confidential pursuant to RCW 42.56.360(1)(j) and RCW 42.04.362 and accessible only to PFT's and the individual tested.

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Name: _____ Date: _____

PFT _____

Has the Medical Questionnaire been filled out? Yes / No Target Heart Rate by Age

Age: _____ Weight: _____ lbs. Height: _____

BMI: _____ [703 x (weight (lbs.) / height (in.)²)]

Resting HR: _____ bpm

If HR > 110 bpm, rest 5 min. and retake it;

If over again, postpone evaluation

Retest resting HR: _____ bpm

Target HR: _____ bpm

Resting BP: _____

If BP > 160/100 mm Hg rest 5 min. and retake;

If over again postpone evaluation.

Retest resting BP: _____

Body Fat

Site	Measurement
Tricep	
Subscapular	
Iliac Crest	
Umbilical	
Chest (Men)/Calf (Women)	
Thigh	
Sum	

AGE	BPM	AGE	BPM	AGE	BPM	AGE	BPM
18	166	30	159	42	152	54	145
19	165	31	158	43	151	55	144
20	165	32	158	44	151	56	143
21	164	33	157	45	150	57	143
22	164	34	157	46	149	58	142
23	163	35	156	47	149	59	142
24	163	36	155	48	148	60	141
25	162	37	155	49	148	61	140
26	161	38	154	50	147	62	140
27	161	39	154	51	146	63	139
28	160	40	153	52	146	64	139
29	160	41	152	53	145	65	138

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Formulas:

Men – **Sum** x .1066

Women – **Sum** x .224

Body Fat %: _____

Aerobic Capacity Evaluation

Warm Up:

1. Attach heart rate monitor.
2. Instruct participant to straddle the treadmill belt.
3. Increase speed to 1 mph and instruct to step on belt.
4. Increase to 3 mph @ 0% slope for 3 min.
5. Start stopwatch when treadmill reaches 3 mph.

Evaluation:

1. Adjust speed and slope as specified.
2. When participant's heart rate exceeds target heart rate, note time and continue for 15 seconds.
3. If participant's heart rate remains above target heart rate, proceed to cool down.

Cool Down:

1. Set treadmill to 3 mph @ 0%.
2. Continue for 3 min., recording heart rate after 1 min.

SECONDS TO DECIMAL EQUIVALENT					
SECONDS	DECIMAL	SECONDS	DECIMAL	SECONDS	DECIMAL
1	0.02	21	0.35	41	0.68
2	0.03	22	0.37	42	0.70
3	0.05	23	0.38	43	0.72
4	0.07	24	0.40	44	0.73

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Time	MPH	%Grade
0:00 - 1:00	3.0	0
1:01 - 2:00	3.0	0
2:01 - 3:00	3.0	0
3:01 - 4:00	4.5	0
4:01 - 5:00	4.5	2
5:01 - 6:00	5.0	2
6:01 - 7:00	5.0	4
7:01 - 8:00	5.5	4
8:01 - 9:00	5.5	6
9:01 - 10:00	6.0	6
10:01 - 11:00	6.0	8
11:01 - 12:00	6.5	8
12:01 - 13:00	6.5	10
13:01 - 14:00	7.0	10
14:01 - 15:00	7.0	12
15:01 - 16:00	7.5	12
16:01 - 17:00	7.5	14
17:01 - 18:00	8.0	14
Recovery Phase		
0:00 - 1:00	3.0	0
1:01 - 2:00	3.0	0
2:01 - 3:00	3.0	0

5	0.08	25	0.42	45	0.75
6	0.10	26	0.43	46	0.77
7	0.12	27	0.45	47	0.78
8	0.13	28	0.47	48	0.80
9	0.15	29	0.48	49	0.82
10	0.17	30	0.50	50	0.83
11	0.18	31	0.52	51	0.85
12	0.20	32	0.53	52	0.87
13	0.22	33	0.55	53	0.88
14	0.23	34	0.57	54	0.90
15	0.25	35	0.58	55	0.92
16	0.27	36	0.60	56	0.93
17	0.28	37	0.62	57	0.95
18	0.30	38	0.63	58	0.97
19	0.32	39	0.65	59	0.98
20	0.33	40	0.67	60	1.00

Test Time: _____ HR at Cool Down: _____

$$VO_2 \text{ max} = 56.981 + (1.242 \times \text{TIME}) - (0.805 \times \text{BMI})$$

Test Time (decimal): _____

BMI: _____

VO₂max: _____

Reason for terminating test: _____

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NORMATIVE DATA FOR VO₂ MAX

Male (values in ml/kg/min):

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
13-19	<35.0	35.0 - 38.3	38.4 - 45.1	45.2 - 50.9	51.0 - 55.9	>55.9
20-29	<33.0	33.0 - 36.4	36.5 - 42.4	42.5 - 46.4	46.5 - 52.4	>52.4
30-39	<31.5	31.5 - 35.4	35.5 - 40.9	41.0 - 44.9	45.0 - 49.4	>49.4
40-49	<30.2	30.2 - 33.5	33.6 - 38.9	39.0 - 43.7	43.8 - 48.0	>48.0
50-59	<26.1	26.1 - 30.9	31.0 - 35.7	35.8 - 40.9	41.0 - 45.3	>45.3
60+	<20.5	20.5 - 26.0	26.1 - 32.2	32.3 - 36.4	36.5 - 44.2	>44.2

Female (values in ml/kg/min):

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
13-19	<25.0	25.0 - 30.9	31.0 - 34.9	35.0 - 38.9	39.0 - 41.9	>41.9
20-29	<23.6	23.6 - 28.9	29.0 - 32.9	33.0 - 36.9	37.0 - 41.0	>41.0
30-39	<22.8	22.8 - 26.9	27.0 - 31.4	31.5 - 35.6	35.7 - 40.0	>40.0
40-49	<21.0	21.0 - 24.4	24.5 - 28.9	29.0 - 32.8	32.9 - 36.9	>36.9
50-59	<20.2	20.2 - 22.7	22.8 - 26.9	27.0 - 31.4	31.5 - 35.7	>35.7
60+	<17.5	17.5 - 20.1	20.2 - 24.4	24.5 - 30.2	30.3 - 31.4	>31.4

Muscular Strength

Grip Strength:

1. This evaluation is a series of 6 trials, 3 for each hand, alternating hands with each attempt.
2. Adjust dynamometer to fit snugly in the first proximal finger joint.
3. The participant will stand upright, elbow bent at a 90° angle, and hand in neutral grip position.
4. Squeeze the device with maximum force for 3 seconds while exhaling.
5. Record reading, reset peak-hold needle to zero, and proceed to trial with opposite hand.

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Reason for terminating test: _____

Dominant Hand:	<input type="checkbox"/> LEFT	<input type="checkbox"/> RIGHT
Trial I	lb	lb
Trial II	lb	lb
Trial III	lb	lb
Highest:	lb	

Arm Strength:

1. This evaluation is a series of 3 trials, in which the participant will ease into the arm contraction without moving the arms or jerking hands.
2. Adjust the chain so that the bar can be held in the hands while the arms are flexed at 90°.
3. The participant must not shrug shoulders, bend back, or perform any other motion other than biceps flexion.
4. The participant will flex maximally for 3 seconds and rest for 30 seconds.
5. Record each reading and reset peak-hold needle.
6. Repeat 2 more trials.

Reason for terminating test: _____

Trial 1: _____ Trial 2: _____ Trial 3: _____

Highest Score: _____

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Leg Strength:

1. This evaluation is a series of 3 trials, in which the participant will ease into the leg contraction without bending at the waist, flexing the arms, or jerking the hands.
2. If at any time the participant experiences any pain or discomfort, especially around the spine, terminate the assessment.
3. Adjust the chain so that the handle reaches just above the participant's knee, when legs are straight.
4. Instruct the participant to:
 - a. Flex at knees and hips to reach the handle.
 - b. Hold the bar and look straight ahead with neck in neutral position.
 - c. Fully extend arms and maintain straight (neutral) back.
5. Encourage the participant to apply 50% force for 3 seconds during first trial
6. The participant should use maximum force for 3 seconds for trials 2 & 3.
7. Record the readings of trials 2 & 3, reset peak-hold needle, and allow for 30 seconds rest after each trial.

Reason for terminating test: _____

Trial 2: _____

Trial 3: _____

Highest Score: _____

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Muscular Endurance

Prone Static Plank:

1. Place a mat on the floor and have the participant set up lying face down in a push-up position.
2. The participant should place their forearms on the mat and use the forearms for the base of support. The elbows should be lined up directly underneath the shoulders and the forearms should be pointed straight ahead. As an option, they may clasp their hands together while resting on the forearms, as long as the elbows remain directly under the shoulder.
3. The participant should position their feet so that their toes are on the floor and their feet are together. The ankles should maintain an angle of 90° throughout the test.
4. Once the feet are in position, the participant then extends the knees to lift himself/herself up off of the floor and support their body from the forearms and toes.
5. They should be instructed to tighten their abdominals to support their back and their back should remain flat like a plank.
6. You should be able to draw an imaginary line straight through their ear, center of the shoulder, hip socket, and ankle when they are in the correct position.
7. As soon as they are in position a stopwatch is started and the time that they can maintain proper positioning for is recorded.
8. Body alignment should remain like a plank, the scapula should remain stabilized, and the ankles positioned at 90 degrees.

Test will be terminated when the participant:

1. Reaches 4 min.
2. Is unable to maintain proper form after 2nd warning.

Test Time: _____ seconds

Reason for terminating test: _____

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Push-Ups:

1. Push-ups are performed for 2 minutes.
2. Push-ups are done in cadence with a metronome set for 80 bpm (one beat down and one beat up).
3. Evaluation is initiated from the "up" position.
4. Participant lowers body until their chin touches an object 5" from the ground (i.e. cup; sponge).
5. Arms must fully extend during the up phase.

Test will be terminated when the participant:

1. Reaches 80 push-ups.
2. Performs 3 consecutive incorrect push-ups.
3. Fails to maintain continuous motion with the metronome.

* Participants with a history of shoulder and/or wrist injury that could be exacerbated by performing the conventional push-up protocol may perform the WFI alternate grip push-up evaluation (using parallelles, or dumbbells).

Completed Push-ups: _____

Reason for terminating test: _____

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Flexibility

Modified Sit and Reach:

1. The evaluation is a series of 3 trials.
2. Flexion must be smooth and slow.

Adjusting measuring device:

1. Instruct participant to sit on the floor, ensuring the head, upper back, and lower back are in contact with the wall.
2. Participant should place legs together, fully extended.
3. Position the box flat against the feet.
4. Have participant extend arms fully in front of the body with one hand over the other (check scapular retraction).
5. Set the guide to 0 inches at the tips of the middle fingers.

Evaluation:

1. Participant will exhale continuously while stretching slowly forward, bending at the waist and reaching ahead with arms.
2. Full extension of the legs must be maintained.
3. Stretch must be held momentarily at endpoint.
4. Record the greatest reach distance from among the 3 trials, rounded to the nearest 1/4".

Trial 1: _____

Trial 2: _____

Trial 3: _____

Highest Score: _____

Reason for terminating test: _____