



NFPA 1583 – Self-Assessment Tool

Overview

A self-assessment gives the member valuable feedback on their individual fitness level, ability to recover from exertion, and overall physical capacity. It is an evaluation that the member can safely perform to gain insight regarding their current fitness, recent improvement, and areas to pursue further change.

The self-assessment described below can be performed with minimal equipment and can be customized for and by each member to ensure that it accommodates their current abilities. The information collected from the assessment is valuable because it can be used to track progress and identify specific areas that could be targeted with an exercise program. The results can also shed light on specific aspects of the member's capacity that will influence their safety on the fire ground (e.g., ability to recover).

A personalized exercise program is a major component of a wellness program. It should accommodate the member's current level of fitness as determined with information from the periodic assessments completed throughout the year, in addition to relevant job duties, barriers to activity, physical capabilities, dietary status, sleep habits, motivation, and mindset.

Self-Assessment Protocol

The self-assessment described below is just one of many options that can be used to track progress and identify areas for further improvement. It assesses a member's strength and endurance and accommodates the interests, abilities, and needs of each individual.

Prior to participating in the self-assessment, every member should be medically cleared by the department physician. Additionally, the member should properly complete a brief warm-up before carrying out the following protocol:

- 1) Prior to performing the self-assessment, assemble the following equipment:
 - a. Heart rate monitor
 - b. Treadmill (capable of 9.5 mph and 15 percent grade) or stepmill (capable of 118 steps per minute)
 - c. Bar to hang from (adjustable from 3 to 8 feet off the floor)
 - d. Dumbbells (if applicable; choice load)
- 2) Place the equipment conveniently close to the treadmill (or stepmill) as the member will be returning to this piece of equipment throughout the assessment.

- 3) Wet the heart receiver and have the member equip it. Tighten it to a comfortable setting. Turn on the watch and be sure it is receiving their heart rate.

The assessment is now ready to being. Time and heart rate will be recorded multiple times during the assessment; therefore, the member should move at as brisk a pace as they can comfortably between exercises.

Get the self-assessment worksheet, mark the date, and check each of the boxes that will be included in the assessment. Keep this sheet with you during the assessment to document heart rate, rating of perceived exertion (RPE), load, and any observations made. Once the assessment has begun, encourage the participant to move from one exercise to the next with no more than 30 seconds between each. For each of the squat, lunge, hinge, push, and pull exercises, encourage the participant to maintain a consistent range of motion throughout the activity so future comparisons can be made. The components of the self-assessment are as follows:

Strength and Endurance Assessment

From the following lists, choose one cardiorespiratory activity and one musculoskeletal activity, each, of the squat, push, lunge, pull, and hinge pattern exercises:

Cardiorespiratory Options

- 1) Treadmill at 9.5 mph and 5 percent grade. Have the participant straddle the treadmill and start the belt. Set the speed at 2 mph while you increase the incline to 5 percent. As soon as the belt reaches 2 mph the participant can step on the treadmill. Once the incline reaches 5 percent, increase the speed to 9.5 mph.. As soon as the speed hits 9.5 mph the assessment will begin. Have the participant run on the treadmill at 9.5 mph and 5 percent grade for 1 minute. At the end of the minute record their heart rate and rating of perceived exertion (RPE) on a scale of 1 to 10 (10 being the most challenging thing they have ever done) and transition to the next exercise in the circuit.
- 2) Treadmill at 6.5 mph and 10 percent grade. Have the participant straddle the treadmill and start the belt. Set the speed at 2 mph while you increase the incline to 10 percent. As soon as the belt reaches 2 mph they can step on the treadmill. Once the incline reaches 10 percent, increase the speed to 6.5 mph. As soon as the speed hits 6.5 mph, the assessment will begin. Have the participant run on the treadmill at 6.5 mph and 10 percent grade for 1 minute. At the end of the minute record their heart rate and RPE on a scale of 1 to 10 and transition to the next exercise in the circuit.
- 3) Treadmill at 3.5 mph and 15 percent grade. Have the participant straddle the treadmill and start the belt. Set the speed at 2 mph while you increase the incline to 15 percent. As soon as the belt reaches 2 mph they can step on the treadmill. Once the incline reaches 15 percent, increase the speed to 3.5 mph. As soon as the speed hits 3.5 mph, the assessment will begin. Have the participant walk on the treadmill at 3.5 mph and 15 percent grade for 1 minute. At the end of the minute record their heart rate and RPE on a scale of 1 to 10 and transition to the next exercise in the circuit.

- 4) Stepmill at level 14 (118 steps per minute). Have the participant step on the stepmill. Set the speed at level 4 (46 steps per minute) for 20 seconds. After 20 seconds, increase the speed to level 14 (118 steps per minute). As soon as the speed hits level 14, the assessment will begin. Have the participant climb stairs on the stepmill at level 14 for 1 minute. At the end of the minute record their heart rate and RPE on a scale of 1 to 10 and transition to the next exercise in the circuit.
- 5) Stepmill at level 10 (89 steps per minute) with a 20 lb weighted vest. Have the participant securely put on the weighted vest and step on the stepmill. Set the speed at level 4 (46 steps per minute) for 20 seconds. After 20 seconds, increase the speed to level 10 (89 steps per minute). As soon as the speed hits level 10, the assessment will begin. Have the participant climb stairs in the stepmill at level 10 for 1 minute. At the end of the minute record their heart rate and RPE on a scale of 1 to 10 and transition to the next exercise in the circuit
- 6) Stepmill at level 6 (60 steps per minute) with a 40 lb weighted vest. Have the participant securely put on the weighted vest and step on the stepmill. Set the speed at level 4 (46 steps per minute) for 20 seconds. After 20 seconds, increase the speed to level 6 (60 steps per minute). As soon as the speed hits level 6, the assessment will begin. Have the participant climb stairs on the stepmill at level 6 for 1 minute. At the end of the minute record their heart rate and RPE on a scale of 1 to 10 and transition to the next exercise in the circuit.

Musculoskeletal Options

Squat Pattern Exercises

- 1) One-leg Squat. Have the participant stand on one leg and place their arms to the front or side. While keeping their stance heel in contact with the floor, instruct them to squat down as low as they can comfortably and stand back up. Perform 30 repetitions with a load of their choice (15 each leg). Encourage them to keep their stance knee, hip, and foot aligned if viewed from the front, and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 2) Jump squat. Have the participant stand with feet approximately hip width apart and their arms to the front or side. Jump and land. Perform 30 repetitions with a load of their choice. Encourage them to keep the knees, hips, and feet aligned if viewed from the front, and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 3) Air squat. Have the participant stand with feet approximately hip width apart and their arms to the front or side. Instruct them to squat down as low as they can comfortably and stand back up. Perform 30 repetitions with a load of their choice. Encourage them to keep the knees, hips, and feet aligned if viewed from the front, and the back in a neutral

position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.

Push Pattern Exercises

- 1) Handstand push-up. Have the participant adopt an inverted position, facing away from the wall, with their hands approximately 1 to 1.5 ft from the wall. Instruct them to lower themselves toward the floor as far as they can comfortably and return to an outstretched arm position. Perform 30 repetitions with a load of your choice. Encourage them to keep the shoulders down and away from the ears and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 2) Push-up. Have the participant adopt a push-up position with their hands and feet shoulder width apart. Instruct them to lower themselves toward the floor as far as they can comfortably and return to an outstretched arm position. Perform 30 repetitions with a load of their choice (change body angle or use band resistance/assistance as needed). Encourage them to keep the shoulders down and away from the ears and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 3) Front plank with shoulder tap. Have the participant adopt a push-up position, with their hands shoulder width apart and the feet a minimum of shoulder width apart. Instruct them to lift their right hand and touch the left shoulder. Repeat on the left side. Perform 30 repetitions with a load of their choice (15 with each arm). Encourage them to keep the shoulders down and away from the ears and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.

Lunge Pattern Exercises

- 1) Lateral lunge. Have the participant stand with feet approximately hip width apart and their arms to the front or side. Instruct them to lunge to the right, descend as low as they can comfortably, and return to standing. Repeat on the left side. Perform 30 repetitions with a load of their choice (15 with each leg). Encourage them to keep the knees, hips, and feet aligned if viewed from the front, and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 2) Front lunge. Have the participant stand with feet approximately hip width apart and their arms to the front or side. Instruct them to lunge forward with the right leg, descend as low as they can comfortably, and return to standing. Repeat on the left side. Perform 30 repetitions with a load of their choice (15 with each leg). Encourage them to keep the knees, hips, and feet aligned if viewed from the front, and the back, in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.

- 3) Back lunge. Have the participant stand with feet approximately hip width apart and their arms to the front or side. Instruct them to lunge backward with the right leg, descend as low as they can comfortably, and return to standing. Repeat on the left side. Perform 30 repetitions with a load of your choice (15 with each leg). Encourage them to keep the knees, hips, and feet aligned if viewed from the front, and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.

Pull Pattern Exercises

- 1) Pull-up. Have the participant adopt a hanging position, with a prone or neutral grip. Instruct them to raise their chin toward the bar and return to an outstretched arm position. Perform 30 repetitions with a load of your choice (band assistance can be used). Encourage them to keep the shoulders down and away from the ears and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 2) Inverted row. Have the participant adopt an inverted hang position beneath the bar, with the hands and feet shoulder width apart and the hips extended. Adjust the height of the bar to suit their abilities and bend the knees to approximately 90 degrees. Instruct them to pull themselves towards the bar and return to an outstretched arm position. Perform 30 repetitions with a load of their choice (change body angle or use band resistance/assistance as needed). Encourage them to keep the shoulders down and away from the ears and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 3) Inverted hang with shoulder tap. Have the participant adopt an inverted hang position, with the hands shoulder width apart and the feet a minimum of shoulder width apart. The hips should be extended with the knees at 90 degrees. Instruct them to lift their right hand and touch the left shoulder. Repeat on the left side. Perform 30 repetitions with a load of their choice (15 with each arm). Encourage them to keep the shoulders down and away from the ears and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.

Hinge Pattern Exercises

- 1) One leg Romanian deadlift (RDL). Have the participant stand on one leg and place their arms to the front or side. While keeping their stance heel in contact with the floor and a slight bend in their stance knee, instruct them to bend forward at the hips, go down as low as they can comfortably, and stand back up. Perform 30 repetitions with a load of their choice (15 with each leg). Encourage them to keep the stance knee, hip, and foot aligned if viewed from the front, and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.

- 2) Good morning. Have the participant stand with their feet hip width apart and the arms across their chest or behind your head. While keeping their feet in contact with the floor and a slight bend in their knees, instruct them to bend forward at the hips, go down as low as they can comfortably, and stand back up. Perform 30 repetitions with a load of your choice. Encourage them to keep the knees, hips, and feet aligned if viewed from the front, and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 3) Alternating hip bridge. Have the participant lie on their back on the floor with their knees bent to 90 degrees and their arms at the side. Instruct them to raise their hips off the floor to assume a straight body position. While keeping their feet in contact with the floor and the hips raised, instruct them to lift the right foot off the floor, flex their right hip as far as they can comfortably, and lower it back down to the floor. Repeat on the left side. Perform 30 repetitions with a load of their choice (15 with each leg). Encourage them to keep the stance knee, hip, and foot aligned if viewed from the front, and the back in a neutral position (same as standing). At the end of the 30 repetitions, record their heart rate, RPE, and the load used, then transition to the next exercise in the circuit.

The circuit protocol is as follows:

- 1) Perform the cardiorespiratory activity for 1 minute. Record heart rate and RPE, then transition to the next exercise in the circuit.
- 2) Perform 30 repetitions of the squat pattern activity. Record heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 3) Perform the cardiorespiratory activity for 1 minute. Record heart rate and RPE, then transition to the next exercise in the circuit.
- 4) Perform 30 repetitions of the push pattern activity. Record heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 5) Perform the cardiorespiratory activity for 1 minute. Record heart rate and RPE, then transition to the next exercise in the circuit.
- 6) Perform 30 repetitions of the lunge pattern activity. Record heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 7) Perform the cardiorespiratory activity for 1 minute. Record heart rate and RPE, then transition to the next exercise in the circuit.
- 8) Perform 30 repetitions of the pull pattern activity. Record heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 9) Perform the cardiorespiratory activity for 1 minute. Record heart rate and RPE, then transition to the next exercise in the circuit.
- 10) Perform 30 repetitions of the hinge pattern activity. Record heart rate, RPE, and the load used, then transition to the next exercise in the circuit.
- 11) Sit in a quiet location and record heart rate and RPE every minute for 3 minutes.

Interpreting Results

- 1) Determine 85 percent of the participant's estimated maximum heart rate, which will be the target exercise heart rate, using the following simple Karvonen Method equation:

$$\text{Target exercise heart rate} = 0.85(220 - \text{age})$$

Example: The target exercise heart rate of a 40-year-old individual would be 153. [Target exercise heart rate = $0.85 (220 - 40) = 153$]

- 2) Observe their heart rate throughout the assessment to see if it ever goes above your 85 percent value. If their heart rate is near maximal, it could indicate that they need to work on their cardiorespiratory fitness. This might indicate that they have limited reserve if tasked with a similar demand on the fire ground.
- 3) For each exercise, note whether they completed 30 repetitions while meeting the movement-related criteria. If they were able to perform 30 repetitions while maintaining the movement criteria, they have the physical capacity to meet the demands of the activity and could increase the challenge. If they were able to perform 30 repetitions but did not maintain the movement criteria, they have sufficient fitness to meet the demands of the activity but should improve their awareness and body mechanics. If they were unable to perform the 30 repetitions, they are lacking the fitness to meet the demands of the activity and should prioritize fitness.
- 4) Observe their total time and compare it to their total time from the previous assessment. If they were able to complete the circuit in less time than their last self-assessment and their heart rate or RPE was the same or lower, their general fitness level has improved.
- 5) Observe their 3-minute recovery. A heart rate that recovers quickly is indicative of cardiorespiratory fitness. If their heart rate after 1, 2, and 3 minutes was lower than their last self-assessment, your cardiorespiratory fitness level has improved.

Reproduced with permission of NFPA from NFPA 1583, *Standard on Health-Related Fitness Programs for Fire Department Members*, 2022 edition. Copyright© 2021, National Fire Protection Association. For a full copy of NFPA 1583, please go to www.nfpa.org.