



NORTHWEST FIRE DISTRICT

Annual Health Fitness Evaluation Pre-test Booklet



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Annual Health Fitness Evaluation Pre-test Booklet



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District Fitness

- *Operations Manual Provisions*
 - *Fitness Protocols*
 - *Functional Movement Screen*
-



District Fitness Coordinator

Tim Agan

Shift Peer Fitness Trainers

**A Shift - Tony Compagno
Ryder Hartley**

**B Shift - Char Latham
Don Patch**

**C Shift - Roger Moore
Heath Evans**

For assistance with YOUR fitness program contact Tim Agan or one of the Shift Peer Fitness Trainers.



Functional Movement Screen TM

Rotary Stability

This test is a complex movement requiring proper neuromuscular coordination and energy transfer from one segment of the body to another through the torso. The rotary stability test assesses multi-plane trunk stability during a combined upper and lower extremity motion.



Functional Movement Screen™

stance stability. The hurdle step assesses bilateral functional mobility and stability of the hips, knees and ankles.

In-Line Lunge

This test attempts to place the body in a position that will focus on the stresses as simulated during rotational, decelerating and lateral type movements. The in-line lunge is a test that places the lower extremity in a scissor type position, challenging the body's trunk and extremities to resist rotation and maintain proper alignment. The test assesses hip mobility and stability, quadriceps flexibility, ankle and knee stability.

Shoulder Mobility

The shoulder mobility screen assesses bilateral shoulder range of motion, combining internal rotation with adduction and external rotation with abduction. It also requires normal scapular mobility and thoracic spine extension.

Active Straight Leg Raise

The active straight leg raise tests the ability to disassociate the lower extremity while maintaining stability in the torso. The active straight leg raise test assesses active hamstring and gastroc-soleus flexibility while maintaining a stable pelvis and active extension of opposite leg.

Trunk Stability Push-Up

The trunk stability push-up tests the ability to stabilize the spine in an anterior and posterior plane during a closed-chain upper body movement. It assesses trunk stability in the sagittal plane while a symmetrical upper-extremity motion is performed. The clearing test checks for pain during passive hyperextension of the lumbar spine



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Annual Health Fitness Evaluation

Introduction to Annual Health Fitness Evaluation

The Annual Health Fitness Evaluation is a process for all District employees enrolled in the Public Safety Personnel Retirement System (PSPRS) to help them assess their level of physical fitness.

Purpose

The purpose of the Annual Health Fitness Evaluation is to assist District employees in attaining the physical and mental fitness to be healthy, reduce injuries and optimize their job performance throughout their career. An additional purpose of this policy is to enable the members to live a healthy and productive life after their career with the Northwest Fire/Rescue District.

Scope of Application

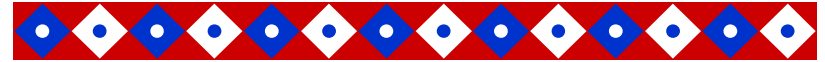
This policy shall follow the most current standard and guidelines set forth in NFPA 1500 *Standard on Fire Department Occupational Safety and Health Program*, NFPA 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments* and NFPA 1583 *Standard on Health-Related Fitness Programs for Fire Fighters*. This policy shall apply to all District employees currently enrolled in the Public Safety Personnel Retirement System including:

Frequency

The Health Fitness Evaluations will be conducted annually during the Third Quarter of each calendar year prior to the employee medical examinations.

Responsibilities

The District's Health Fitness Coordinator, working under the direction of the District Physician, will oversee all components of the fitness evaluation.



Functional Movement Screen TM

The Functional Movement Screen TM is a tool that is made up of seven tests which categorizes and rank functional movement patterns. These patterns are specific to human growth and development. They are important in athletics and now in the fire service. The movement patterns are extremely important because they are fundamental, to complex activities.

The FMS attempts to pinpoint a weak area in the movement patterns. Once the area of weakness is identified, an individual exercise program can be created to improve performance.

The FMS can be the first line of injury prevention. The goal is to have an objective assessment to improve human functional movement.

The seven movement tests are:

Deep Squat

The squat is a movement needed in most athletic events and in performing firefighter's everyday duties, in the station and on emergency scenes. It is the ready position and is required for most power movements involving the lower extremities. The deep squat is used to assess bilateral, symmetrical, functional mobility of the hips, knees, and ankles. The dowel is held overhead assesses bilateral, symmetrical mobility of the shoulders as well as the thoracic spine.

Hurdle Step

The hurdle step is designed to challenge the body's proper stride mechanics during a stepping motion. The movement requires proper coordination and stability between the hips and torso during the stepping motion as well as single leg



Fitness Protocols

PUSH –UP PROTOCOL

Equipment:

Metronome, Stopwatch

The evaluation is a series of push-ups performed in a two minute time period, using a metronome set at a speed of “80” **allowing for 40 push-ups per minute, for a total of 80 push-ups.**

The evaluation is started:

From the “up” position (*hands are shoulder width apart, back is straight, and the head is in a neutral position*)

Feet are not allowed against a wall or other stationary item

Back must be straight at all times and you must push up to a straight arm position

You must stay in time with the cadence of the metronome, one beat up and one beat down

Come down until your arms are at a 90 degree angle (see demonstration)

The administrator shall stop the evaluation when the individual:

- A. Reaches 80 push-ups;
- B. Performs three consecutive incorrect push-ups; or
- C. Does not maintain continuous motion with the metronome cadence

The highest number of **successfully** completed push-ups will be recorded

If at any time during the evaluation, the individual experiences chest pain, light-headedness, ataxia, confusion, nausea, or clamminess, the evaluation will be terminated.



Annual Health Fitness Evaluation

tion. The District’s Peer Fitness Trainers will assist the Coordinator with conducting the fitness evaluations and functional movement screens.

The components of the fitness evaluation consists of the following:

- A The Five Components of Fitness
 - 1. Aerobic Capacity / VO₂ max
 - 2. Flexibility
 - 3. Muscular Strength
 - 4. Muscular Endurance
 - 5. Body Composition / Percent Body Fat
- B Functional Movement Screen
- C. 12 Lead EKG
- D. Vitals
 - 1. Blood Pressure
 - 2. Pulse
- E. Height and Weight
- F. Exercise Program Design
- G. Nutrition Counseling

Procedure

The Health Fitness Evaluations are based on the components of physical fitness:

- Aerobic Capacity / VO₂ max
- Flexibility
- Muscular Strength
- Muscular Endurance
- Body Composition / Percent body fat
- Functional Movement Screen

The evaluations will be conducted using the protocols contained in the *Fitness Coordinators Manual, NFPA 1583, Peer Fitness Trainer Manual*



Annual Health Fitness Evaluation

and the *Wellness-Fitness Initiative*.

Aerobic Capacity / VO₂ max will be measured using the *Sub-Max Treadmill Test using the Gerkin Protocol*.

Flexibility will be measured using the *Modified Sit and Reach Test*.

Muscular Strength will be measured using a *Hand Dynamometer* or a *Leg/Arm Dynamometer*.

Muscular Endurance will be measured by performing *Push-Ups* and *Curl Ups*. a metronome will be used for push-ups, set at a speed of 80; and for curl-ups, set at a speed of 60.

Body Composition / Percent Body Fat will be measured by two methods:

- *Skin Fold Measurement*
- *Circumference Measurement*

Confidentiality

It shall be the responsibility of the District's Fitness Coordinator and the Peer Fitness Trainers to maintain the highest level of confidentiality regarding the information gathered during these evaluations. They will sign a *Confidentiality Agreement* annually prior to administration of evaluations.

Medical Clearance

Based on the results of the annual medical exam, employees on regular duty are considered to be healthy and capable of participating in the annual Health Fitness Evaluations.



Fitness Protocols

eleventh minute of the evaluation, the evaluation is ended and the final stage is recorded

The member is instructed to remain on the treadmill for a cool-down period for a minimum of three minutes at three mph and a 0% grade. Continue to monitor the heart rate during the cool-down period. Record the heart rate after one minute of cool-down.

Use the final stage and the conversion table and record the V02 max

GRIP STRENGTH PROTOCOL

Equipment:

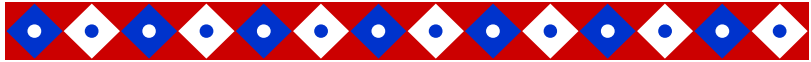
Hand dynamometer
Dry towel

The grip strength evaluation will measure the grip strength of each hand using a hand dynamometer.

The member being evaluated will assume a slightly bent forward position, with the elbow bent at a 90 degree angle, shoulder adducted and neutrally rotated forearm and the wrist in a neutral position.

The member is instructed to squeeze the dynamometer with maximum strength for 2-3 seconds while exhaling and then slowly releasing the grip. The member will maintain the proper position of the arm during each measurement.

The evaluator will measure both hands alternatively allowing three measurements per hand. The evaluator will record the highest reading for both hands.



Fitness Protocols

will terminate once their monitored heart rate exceeds the target exercise heart rate for 15 seconds. **Target exercise heart rate is 85% of predicted maximal heart rate.** The evaluation is a series of one-minute exercise stages, alternating between percent grade and speed (*first minute % grade is increased, second minute speed is increased*) The member is informed that if at anytime during the evaluation they experience chest pain, feeling light headed, ataxia, confusion, nausea, or clamminess, they should ask the evaluator to stop the evaluation.

The member is informed that the belt speed will gradually increase to the starting speed of 4.5 mph and 0% grade, at which Stage One begins. The member is permitted to either walk or run, whichever feels more comfortable.

During the evaluation the member’s heart rate is continuously monitored and the heart rate is recorded during the last quarter (15 seconds) of each stage. At the completion of the first minute (stage 1 = 4.5 mph at 0% grade), the grade should be increased to 2%. Subsequently, after every odd minute the grade will be increased and additional 2%. After every even minute the speed will be increased 0.5 mph (*odd minute = increase % grade; even minute = increase in speed*), this will continue until the member’s heart rate exceeds their target exercise heart rate or demonstrates any of the criteria for early termination of the treadmill evaluation.

Once the member’s heart rate exceeds the target exercise heart rate, the member continues the evaluation for an additional 15 seconds. This 15 second period allows for the members heart rate to stabilize. During this period, the evaluation will remain at the stage where the target exercise heart rate is exceeded, with speed or grade unchanged. If the heart rate does not return to or below the target exercise heart rate the evaluation ends and the final evaluation stage will be recorded.

If the evaluation is terminated early, the stage at which the evaluation is terminated and the reason for the termination is documented.

Once the member exceeds their target exercise heart rate or reaches the



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Health Fitness Evaluation Standards

It is the policy of the Northwest Fire/Rescue District that suppression employees will maintain and improve their health and physical condition while employed by the District. All employees enrolled in PSPRS shall have a minimum aerobic capacity / VO₂ max of 33.5. All members shall strive to have an aerobic capacity / VO₂ max of 42-45 for optimal health and performance. It is the goal of the Northwest Fire District to have all employees enrolled in PSPRS attain a minimum health fit score of 60.

All suppression employees are highly encouraged to reach a health fit score of 85 or better for optimal health and performance.

Health Fit Score

Your overall health fitness score will be indicated on your fitness report and reflect the following:

| | |
|--------------|--------------------------------|
| 85 or higher | Excellent |
| 60-84 | Meets or exceeds District goal |
| 59 or less | District goal not met |

Incentives

Employees who have a fitness score of “85 or higher” will receive special recognition as indicated below:

- Fitness T-shirt (Fitness score of 85 or better)
- Fitness Excellence Pin (Fitness score of 100)
- Commendation from the Fire Chief (Fitness score of 100)

District Goal Not Met

Employees, who have an **aerobic capacity / VO₂ max score less than**



Annual Health Fitness Evaluation

33.5 and/or a health fit score less than 60, shall be required to meet with the District’s Health Fitness Coordinator (HFC). The HFC will consult with the District’s physician prior to the consultation with the employee. After the consultation, the employee will be referred to one of the District’s Peer Fitness Trainer for the development of an exercise program and/or nutrition counseling.

Employees with a VO₂ max score from 33.5 to 42 are considered “at risk” and should consult with a PFT to assist them with improving their aerobic capacity.

Retest Procedure

An employee will have 90 days to retest. If the employee reaches the District Fitness Goals after the retest, no further action other than maintenance of their fitness is required. If the employee does not reach the District’s Fitness Goals, she/he must continue with the exercise program under the direct supervision of a PFT and retest in 90 days. If they continue to show no improvement, the supervisor will follow the *Corrective Action/Disciplinary Process* as outlined in the Policy Manual.



Fitness Protocols

- the middle fingers
- The member is instructed to exhale slowly while stretching slowly forward, bending at the waist and pushing the measuring block with the middle fingers
- During the stretch, the legs are to remain together and fully extended, and hands are to remain overlaid.
- The stretch is held momentarily and the distance is measured. If the member bounces, flexes the knees or uses momentum to increase distance, the evaluation is not counted
- The member will relax for approximately 30 seconds before beginning the second evaluation. Repeat the evaluation for the third time using the same procedure.

Record the furthest distance.

If at anytime the member being evaluated experience: back pain, chest pain, light headedness, ataxia, confusion, nausea, or clamminess, the evaluation will be terminated

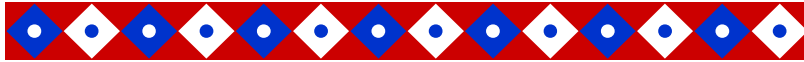
GERKIN TREADMILL PROTOCOL

Equipment:

Treadmill
Heart Rate Monitor
Stopwatch

Protocol:

The member being evaluated is told to straddle the treadmill belt until it begins to move. At approximately one mph, the member is instructed to step onto the belt and the belt speed is increased to three mph at 0% grade. ***The warm up is at three mph at 0% grade for 3 min.*** During the warm-up the member is advised that the evaluation is sub-maximal and



Fitness Protocols

- The buttocks must remain in contact with the floor, no bouncing or rocking will be permitted.
- You must stay in cadence with the metronome, one beat up and one beat down.

The administrator shall stop the evaluation when the individual:

- a. Reaches 90 curl-ups;
- b. Performs three consecutive incorrect curl-ups; or
- c. Does not maintain continuous cadence with the metronome

The highest number of successfully completed curl-ups will be recorded

If at any time during the evaluation, the individual experiences chest pain, light headedness, ataxia, confusion, nausea, or clamminess, the evaluation will be terminated.

MODIFIED SIT AND REACH EVALUATION

Equipment:

Modified sit and reach box

The modified sit and reach flexibility evaluation is a series of three measurements that evaluate the flexibility of the lower back, hamstring muscles and the shoulders. The member is informed that the flexion required during the evaluation must be smooth and slow as he/she advances the slide on the box to the most distal position possible.

The evaluation is started by:

- The member sitting on the floor with their head, upper and lower back against the wall with shoes off and legs fully extended.
- The sit and reach box is placed flat against the feet
- While maintaining head and upper/lower back against the wall, the member is instructed to extend arms fully in front of the body with the right hand over the left. The ruler is set to 0.0 inches at the tip of



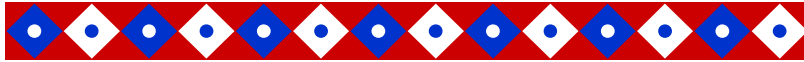
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Indications for Stopping the Fitness Evaluation

The following must be adhered to for stopping the fitness evaluation prematurely:

- Onset of angina or angina-like symptoms
- Signs of poor perfusion: feeling light headed, confusion, ataxia, pallor, cyanosis, nausea, or cold clammy skin
- Failure of heart rate to increase with increase in exercise intensity
- Individual request evaluation to stop
- Physical or verbal manifestations of severe fatigue
- Failure of testing equipment

Failure to keep time with the metronome during the push-up and curl-up evaluation.



Fitness Protocols

BODY COMPOSITION EVALUATION

Equipment:

Cloth measuring tape with a Gulick attachment
Skin fold calipers

The Body Composition Evaluation is a series of three measurements using a measuring tape and skin fold calipers.

Cloth measuring tape protocol:

Measurements will be taken at three sites: Neck, Waist, and Hips (the hip measurement for males will be used for Work Counts/Well America only). All measurements will be taken on the right side of the body.

- **Neck:** Place cloth measuring tape around the neck just below the larynx perpendicular to the long axis of the neck. Two readings will be taken in inches to the nearest 0.5 inch
- **Waist:** Place cloth measuring tape around the waist over the umbilicus (for males) and just above the umbilicus (for females). Abdominal muscles need to be relaxed. (The tape should be in contact with the skin) Two readings will be taken in inches to the nearest 0.5 inch
- **Hips:** Place the cloth measuring tape around the hips at the widest part below the waist; landmark is the greater trochanter, with feet together. The tape should be in contact with the skin; if this is not possible adjust for clothing. Two readings will be taken in inches to the nearest 0.5 inch

Skin Fold Calipers protocol:

Three sites will be used for this evaluation: Triceps, Abdominal and the suprailliac. All measurements will be taken on the right side of the body.



Fitness Protocols

- **Triceps:** Locate the site midway between the acromial process (shoulder) and the olecranon process (elbow). Grasp a vertical fold on the posterior midline and pull it away from the muscle. Holding the calipers perpendicular to the site, place the pads of the calipers approximately ¼ inch from the thumb and forefinger. Approximately one or two seconds after the trigger has been released read the dial to the nearest 0.5 millimeter. A minimum of two readings should be taken, with at least 15 seconds between measurements.
- **Abdominal:** Locate the site on the abdominals approximately one inch to the right of the umbilicus. Follow the same procedures as described above.
- **Suprailliac:** Location of the site is approximately one inch above the point of the right hip bone. Follow the same procedures as described above.

CURL-UP EVALUATION PROTOCOL

Equipment:

Gym mat, Metronome, Stopwatch

The evaluation is a series of curl-ups performed in a three minute time period, using a metronome set at a speed of “60” **allowing for 30 curl-ups per minute, for a total of 90 curl-ups.**

The evaluation is started:

- From the supine position with knees bent at a 90-degree angle, hands are cupped over the ears or at the temples. Hands and arms must be maintained throughout the evaluation.
- If needed the individuals feet will be secured by an assistant
- The curl-up is initiated by flattening the lower back followed by actively contracting the abdominals until the shoulders are off the floor. (The lower back maintains in contact with the floor).