



Fire Fighter Dies After Completing Job Task Evaluation - Alabama

SUMMARY

On June 15, 2001, due to being placed on restricted duty status for health reasons, a 55-year-old male career Captain, was performing a Job Task evaluation (physical ability test) prior to being returned to full duty and reassignment back to his regular fire station. During the evaluation, he began having breathing difficulty; however, he continued with the evolutions. After completing the last evolution and exiting the drill tower, crew members removed his self-contained breathing apparatus (SCBA) and bunker coat, assisted him to the ground, and administered oxygen. Moments later he became unresponsive, stopped breathing, and was pulseless. Approximately 43 minutes later, despite cardiopulmonary resuscitation (CPR) and advanced life support (ALS) administered on the scene and at the hospital, the victim died. The death certificate listed “cardiac arrest” as the immediate cause of death. An autopsy, conducted by a private company, listed “cardiac arrhythmia” due to “myocardial ischemia” due to “coronary artery disease” as the cause of death.

The following recommendations address some general health and safety issues. This list includes some preventive measures that have been recommended by other agencies to reduce the risk of on-the-job heart attacks and sudden cardiac arrest among fire fighters. These selected recommendations have not been evaluated by NIOSH, but represent published research or consensus votes of technical committees of the National Fire Protection Association (NFPA) or fire service labor/management groups.

- ***Provide mandatory annual medical evaluations to ALL fire fighters consistent with NFPA 1582 to determine their medical***

ability to perform duties without presenting a significant risk to the safety and health of themselves or others.

- ***Fire Fighters should be cleared for duty by a physician knowledgeable about the physical demands of fire fighting and the various components of NFPA 1582.***
- ***Incorporate exercise stress tests into the Fire Department’s medical evaluation program.***
- ***Provide fire fighters with medical evaluations and clearance to wear SCBA.***
- ***Provide exercise equipment in all fire stations.***
- ***Ensure that all members participate in the FD’s mandatory wellness/fitness program.***

INTRODUCTION AND METHODS

On June 15, 2001, a 55-year-old male Captain lost consciousness after completing a Job Task evaluation. Despite CPR and ALS administered by crew

The **Fire Fighter Fatality Investigation and Prevention Program** is conducted by the National Institute for Occupational Safety and Health (NIOSH). The purpose of the program is to determine factors that cause or contribute to fire fighter deaths suffered in the line of duty. Identification of causal and contributing factors enable researchers and safety specialists to develop strategies for preventing future similar incidents. The program does not seek to determine fault or place blame on fire departments or individual fire fighters. To request additional copies of this report (specify the case number shown in the shield above), other fatality investigation reports, or further information, visit the Program Website at www.cdc.gov/niosh/firehome.html or call toll free 1-800-35-NIOSH



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members, the Fire Department ambulance crew, and in the emergency department, the victim died. NIOSH was notified of this fatality on June 18, 2001, by the United States Fire Administration. On July 6, 2001, NIOSH contacted the affected Fire Department to initiate the investigation. On July 30, 2001, a Safety and Occupational Health Specialist from the NIOSH Fire Fighter Fatality Investigation Team traveled to Alabama to conduct an on-site investigation of the incident.

During the investigation NIOSH personnel interviewed the following:

- Fire Chief
- Deputy Fire Chief
- Assistant Chief for Administrative Services
- Assistant Chief for Support Services
- Battalion Chief for Operations
- Training Officers
- Safety Officers
- Crew members from the victim's regular shift
- Crew members at the drill tower
- Victim's wife

During the site visit NIOSH personnel reviewed the following:

- Fire Department policies and operating guidelines
- Fire Department training records
- Fire Department annual report for 2000
- Fire Department incident report
- Emergency medical service (ambulance) incident report
- Fire Department physical examination protocols
- Death certificate
- Autopsy record
- Past medical records of the deceased

INVESTIGATIVE RESULTS

Incident. In March, and again in April 2001, the Captain was unable to complete the Job Task evaluation within the time allotment (11 minutes, 15

seconds). After failing to pass the evaluation a second time, he was reassigned to a light duty position in the Safety Division and was subsequently scheduled for physical performance rehabilitation (fitness training) at the Fitness Center. At the beginning of his rehabilitation, it was discovered by the Fitness Center staff that the Captain had a possible heart condition. He was referred to his private physician for treatment prior to being allowed to complete rehabilitation. After the initial evaluation, the victim's private physician would not release him for return to work until additional medical tests were performed.

After an exercise stress test (EST) in April 2001, the Captain was diagnosed with coronary artery disease and prescribed medications, and he took sick time. On May 21, the Captain underwent a cardiac catheterization, which revealed significant coronary artery disease, specifically

100% narrowing of the mid-right coronary artery
60% narrowing of the first diagonal of the left anterior descending artery

90% narrowing of the second obtuse marginal branch of the left circumflex artery

Left ventricular dysfunction (no wall motion in postero-lateral and inferolateral walls)

At the end of May, the Fire Chief met with the Captain to discuss the Captain's request to return to work, perform a Job Task evaluation, and return to a possible staff assignment. The Fire Chief advised the Captain to see him personally after he (the Captain) received a return-to-work statement from his physician.

On June 7, 2001, another EST using the Bruce protocol was conducted. The victim exercised for 9 minutes and 4 seconds (10 METS) before stopping due to fatigue and weakness. He achieved 86% of his target heart rate with a good blood pressure response. He reported no chest pain or any other symptom suggestive of angina, but his EKG showed



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signs of ischemia (reversible ST segment depression). Despite this finding, the Captain was released for return-to-work with no restriction by his private physician. His physician advised him to call if chest pain or shortness of breath occurred. On June 13, the Captain reported back to work and presented a return-to-work statement from his physician to Fire Administration. The Captain was advised to report to work at Safety, where he also presented the return-to-work statement. On June 14, the Captain performed various tasks at Training and requested to perform the Job Task evaluation the next day, June 15, the day of the incident.

On June 15, 2001, the victim reported to the drill tower at 0730 hours to perform the Job Task evaluation (described in detail in a later section of this report). The drill tower is a five-story, noncombustible brick structure, measuring 25 feet by 25 feet. It has an exterior ladder on one side and an exterior and an interior stairway with 16 steps leading to each of the four landings (64 total steps). (See photograph). Engine 24 and Rescue 24 (Fire Department ambulance) arrived on the scene and crew members set up the required equipment, which included two, 50-foot sections of 1¾-inch hose, 150 feet of 3-inch hose, and a 150-pound manikin. Rescue 24 remained on the scene throughout the evaluations in case a medical emergency arose. The Training Instructors and Safety Officer briefed the fire fighters regarding the personal protective equipment to be worn, the specific tasks involved, and the time/score required to pass the test.

The victim was the first fire fighter to take the evaluation that day. At approximately 0900 hours, the victim began the job task procedures. The temperature was 79E Fahrenheit (F), relative humidity was 87%, dry bulb temperature was 77E F, and the wet bulb temperature was 75E F. Wearing full bunker gear (weighing approximately 25 pounds), the victim completed the hose hoist,

hose pull, dummy (manikin) drag, and hydrant hookup/disconnect portions of the test. During these evolutions, he began having breathing difficulty; however, he continued to perform the evolutions. Lastly, the victim donned an SCBA (weighing approximately 22 pounds) and performed the tower climb (128 total steps). A crew member retrieved the oxygen equipment from Rescue 24 and positioned it near the drill tower door in case of need by the victim.

After completing this final task, the victim exited the drill tower. As crew members assisted the victim in removing his SCBA and bunker coat, he began to collapse. Crew members attempted to guide the victim to a nearby chair, but he was unable to walk. The crew members then assisted the victim in lying down. The oxygen mask was placed over his nose and mouth, and crew members retrieved a cardiac monitor from Rescue 24. At 0941 hours, the victim became unresponsive, stopped breathing, and was pulseless. CPR (ventilations via bag-valve-mask) was begun. The cardiac monitor was then attached to the victim, revealing ventricular fibrillation (a heart rhythm incompatible with life). The victim was defibrillated (shocked) three times, each being unsuccessful at converting the victim's heart rhythm. Intubation and intravenous (IV) medications consistent with ALS procedures were administered. The cardiac monitor subsequently revealed asystole (no heart beat) and CPR (now with chest compressions) continued. Rescue 24 transported the victim to a nearby hospital at 0948 hours. En route, ALS procedures and CPR continued. The cardiac monitor again revealed ventricular fibrillation, and an additional shock was delivered, but the heart rhythm reverted to asystole. Rescue 24 arrived at the hospital at 0956 hours. Inside the emergency department, CPR and ALS measures continued until 1024 hours, when he was pronounced dead by the attending physician.

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Medical Findings. The death certificate, completed by the Certifying Physician, listed “cardiac arrest” as the immediate cause of death. Pertinent findings from the autopsy, performed by a private company, on June 17, 2001, included

- Moderate coronary atherosclerosis
 - 50% narrowing of the right coronary artery
 - 50% narrowing of the left main artery
 - 75% narrowing of the left circumflex
 - 80% narrowing of the left anterior descending coronary artery
 - Left anterior descending coronary artery thrombosis
- Acute myocardial ischemia
- Severe concentric left ventricular hypertrophy

The Captain had the following risk factors for coronary artery disease (CAD): advancing age (greater than 45 years old), male gender, hypertension, mild obesity (body mass index [BMI] of 31.94), lack of exercise, and diabetes mellitus. He was prescribed medications for high blood pressure, diabetes, chest pain, and high triglycerides.

According to his wife and crew members, the victim had no complaints of chest pains or any other heart-related illness. The day of the incident, the victim did not report any symptoms suggestive of angina or heart attack to his wife or crew members. The crew members on the scene did notice that the victim began having breathing difficulty during the Job Task evaluation. However, given the physical demands of the Job Task evaluation and the weight of the bunker gear and SCBA, heavy breathing is common.

DESCRIPTION OF THE FIRE DEPARTMENT

At the time of the NIOSH investigation, the Fire Department consisted of 628 uniformed personnel and served a population of 266,000 residents in a

geographic area of 163 square miles. There are 30 fire stations. Fire fighters work the following schedule: 24 hours on-duty; 48 hours off duty, from 0800 hours to 0800 hours.

In 2000, the Department responded to 47,791 calls: 26,145 advanced life support (ALS) calls, 11,203 basic life support (BLS) calls, 3,626 alarm calls, 3,471 other service calls, 1,081 automobile fires, 922 house fires, 689 trash fires, 314 apartment fires, 234 commercial structure fires, 56 fire EMS calls, and 50 mass occupancy structure fires. The day prior to the incident, the victim worked an 8-hour shift at his light-duty position at Training.

Training. The Fire Department requires all new fire fighter applicants to pass a written test, a fit check (described below), a Job Task evaluation, an interview, a physical examination, and a drug screen prior to being hired. Newly hired fire fighters are then sent to the 17-week fire fighter training course at the City Fire Academy to become certified as a Fire Fighter I and II, emergency medical technician (EMT), and hazardous materials (HazMat) First Responder.

Recruits must complete monthly training modules for 1 year. The recruit training program is based on the State minimum requirement for fire fighter certification. Recurrent training occurs daily on each shift. There is no State requirement for fire fighter recertification. Annual recertification is required for hazardous materials, while biannual recertification is required for Apparatus/Operator and EMT/Paramedics. The victim was certified as a Fire Fighter II, Fire Officer, Fire Inspector, Fire Investigator, Fire Service Instructor, and he had 27 years of fire fighting experience.

Preemployment/Preplacement Evaluations. The Department requires a preemployment/preplacement medical evaluation for all new hires, regardless of

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age. Components of this evaluation include the following:

- A complete medical history
- Physical examination
- Pulmonary function test (PFT)
- Audiogram
- Vision screen
- Urinalysis
- Urine drug screen
- Mantoux TB test
- Hepatitis B Titer (if previously immunized)

These evaluations are performed by a physician contracted with the City. Once this evaluation is complete, the contracted physician makes a determination regarding medical clearance for fire fighting duties and forwards this decision to the City's personnel director.

Periodic Evaluations. Periodic medical evaluations are required by this Department for all fire fighters annually. Components of this evaluation include

- A complete medical history
- Physical examination
- Blood tests: cholesterol and triglycerides
- Pulmonary function test
- Audiogram
- Vision screen

These evaluations are performed by another contracted physician who makes a determination regarding medical clearance for fire fighting duties. Fire fighters may elect to have their personal physician perform the physical evaluation. Components of this personal physician evaluation include

- Height, weight, vital signs
- Blood tests: cholesterol, triglycerides, and glucose
- Abbreviated medical history

The results of these annual physical evaluations are sent to the contracted physician who then makes a

final determination regarding annual medical clearance for fire fighting duties. While annual medical clearance for fire fighting is required for all fire fighters, annual SCBA medical clearance is not required.

A fit check is performed annually as part of the Job Task evaluation. The fire fighter must pass the fit check prior to performing the Job Task evaluation. Components of the fit check include

- Height, weight, vital signs (blood pressure < 150/100)
- Body composition
- Upper body strength (bench press)
- Abdomen strength (sit-ups performed in 1 minute)
- Flexibility (sit and reach)
- Cardiorespiratory endurance (timed 1½-mile run or a 3-mile walk)
- Lifestyle assessment
- Nutrition assessment

The Job Task evaluation is completed with the participant wearing full bunker gear. One component of the evaluation, the tower climb, requires the wearing of an SCBA (without facepiece). The Job Task evaluation consists of

- Hose hoist: While standing on the ground, the participant hoists one section of 1 ¾-inch hose to the fourth story of the drill tower utilizing a fixed pulley, lowers the hose to the ground, and then repeats the procedure within 1 minute, 15 seconds.
- Hose pull: The participant places the 3-inch uncharged hose nozzle on his/her shoulder and pulls the 3-inch hose from a starting point until the nozzle crosses the finish line, 150 feet away, within 35 seconds.
- Dummy (manikin) drag: The participant assumes a position on the dummy with the participant's arm under the dummy's arms. The dummy is lying on the ground with the head toward the finish line and the participant behind the start line. The participant

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- pulls the dummy 50 feet until the dummy's head crosses the back of the finish line within 30 seconds.
- Hydrant evolution: The participant must uncap the hydrant, then attach the 3-inch hose to the hydrant. The hydrant is then fully opened and then closed. The hose is disconnected and the cap is replaced on the hydrant, all within 2 minutes, 10 seconds.
 - Tower climb: The participant dons an SCBA (without the facepiece) and places a standpipe package, consisting of two sections of 1 3/4-inch hose, on his/her shoulder. At the starting line, the participant climbs the outside stairs of the drill tower to the fifth floor and places the standpipe package in the fifth-floor window. The participant then climbs the ladder to the roof of the tower and climbs down the roof ladder to the interior of the fifth floor. The participant then goes to the fifth-floor window, places the standpipe package back on his/her shoulder, goes down the interior stairs, and exits the first-floor doorway, all within 3 minutes, 30 seconds.

If a fire fighter fails the Job Task evaluation two times, he/she is placed on administrative assignment to the Safety/Training Division and is required to enter a physical performance rehabilitation program conducted by the City Fitness Center Director. Line personnel failing the Job Task after completing a work hardening program, or failing a third time, remain on administrative assignment pending a determination whether they may return to emergency operations.

If an employee is injured at work, or is ill and off work for one 24-hour shift or more (second occurrence within 12 months), the employee must be evaluated by his/her personal physician. The employee then provides a proof of illness form and a medical release form to his/her immediate supervisor and then to the Safety Division, who makes the final determination regarding "return to work." Fire

fighters assigned to operations who are returning from an extended leave of 30 days or more may be required to successfully complete a Job Task evaluation and/or Fit Check prior to returning to regular duties. An employee may be required to provide a proof of illness form if sick leave abuse is suspected. Light duty positions are available for employees who have been ill or injured and obtain a medical release from their personal physician. If the fire fighter is incapable of returning to fire fighting duties, they are reassigned to a nonemergency position within the City system (contingent on availability).

Exercise (strength and aerobic) equipment is located in 24 of the 30 fire stations. Fire fighters also have access to the City Health and Fitness Center. Mandatory, on-duty wellness/fitness programs are in place for the Department; however, compliance is not ensured. Health maintenance programs are available from the City.

DISCUSSION

In the United States, coronary artery disease (atherosclerosis) is the most common risk factor for cardiac arrest and sudden cardiac death.¹ Risk factors for its development include age over 45, male gender, family history of coronary artery disease, smoking, high blood pressure, high blood cholesterol, obesity, physical inactivity, and diabetes.^{2,3} The victim had six of these risk factors (age over 45, male gender, hypertension, mild obesity, physical inactivity, and diabetes mellitus), and was diagnosed with coronary artery disease at his last physical evaluation.

The narrowing of the coronary arteries by atherosclerotic plaques occurs over many years, typically decades.⁴ However, the growth of these plaques probably occurs in a nonlinear, often abrupt fashion.⁵ Heart attacks typically occur with the sudden development of complete blockage

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(occlusion) in one or more coronary arteries that have not developed a collateral blood supply.⁶ This sudden blockage is primarily due to blood clots (thrombosis) forming on the top of atherosclerotic plaques. A thrombus was identified in the left anterior descending coronary artery on autopsy.

Blood clots, or thrombus formation, in coronary arteries are initiated by disruption of atherosclerotic plaques. Certain characteristics of the plaques (size, composition of the cap and core, presence of a local inflammatory process) predispose the plaque to disruption.⁶ Disruption then occurs from biomechanical and hemodynamic forces, such as increased blood pressure, increased heart rate, increased catecholamines, and shear forces, which occur during heavy exercise.^{7,8}

Fire fighting is widely acknowledged to be one of the most physically demanding and hazardous of all civilian occupations.⁹ Fire fighting activities are strenuous and often require fire fighters to work at near maximal heart rates for long periods. The increase in heart rate has been shown to begin with responding to the initial alarm and persist through the course of fire suppression activities.¹⁰⁻¹² Even when energy costs are moderate (as measured by oxygen consumption) and work is performed in a thermoneutral environment, heart rates may be high (over 170 beats per minute) owing to the insulative properties of the personal protective clothing.¹³ Furthermore, fire fighting can result in severe fluid loss which decreases blood volume and decreases the amount of blood pumped from the heart (stroke volume).¹⁴ Epidemiologic studies have found that heavy physical exertion sometimes immediately precedes and triggers the onset of acute heart attacks.¹⁵⁻¹⁸ The victim was in full bunker gear during the Job Task evaluation and wore an SCBA during the last portion of the evaluation. His activities ranged from walking on level ground to dragging a manikin to carrying a standpipe package up five flights of

stairs. This is considered a heavy level of physical exertion.^{19,20} The physical stress of performing the Job Task evaluation and his underlying atherosclerotic CAD contributed to this fire fighter's heart attack, subsequent cardiac arrest, and sudden death.

To reduce the risk of heart attacks and sudden cardiac arrest among fire fighters, the NFPA has developed guidelines entitled "Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians," otherwise known as NFPA 1582.²¹ NFPA 1582 recommends a yearly physical evaluation to include a medical history, height, weight, blood pressure, and visual acuity test.²¹ NFPA 1582 also recommends a thorough examination to include vision testing, audiometry, pulmonary function testing, a complete blood count, urinalysis, and biochemical (blood) test battery be conducted on a periodic basis according to the age of the fire fighter (less than 30: every 3 years; 30-39: every 2 years; over 40 years: every year). The Department requires a preemployment/preplacement medical examination for all new hires and requires periodic medical evaluations for all fire fighters. However, neither evaluation contains all the NFPA recommended components. (The preemployment/preplacement examination does not include complete blood count, cholesterol and/or triglycerides, or a chest X-ray. The periodic evaluation does not include complete blood count, urinalysis, or stress EKG).

In addition to screening for risk factors for CAD, NFPA 1582 recommends conducting EST on members at age 40, and at age 35 for those with one or more CAD risk factors.²¹ These recommendations are similar to those of the American College of Cardiology/American Heart Association.²² Although not required by this FD, the victim did have an EST performed by his private physician. Although the victim was asymptomatic

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and demonstrated adequate exercise capacity with a normal blood pressure response, his EKG was positive for ischemia in the postero-lateral areas of the heart. The fact that he did not experience chest pain or other symptoms of angina is not uncommon in Type-2 diabetic males.²³

NFPA 1582 categorizes fire fighters' medical conditions as Category A (precludes a person from performing as a fire fighter) and Category B (*could* preclude). CAD, including history of myocardial infarction, coronary artery bypass surgery, or coronary angioplasty, is a category B condition, but Appendix A contains additional guidelines. "Persons at mildly increased risk for sudden incapacitation are acceptable for fire fighting. Mildly increased risk is defined by the presence of each of the following:

- normal left ventricular ejection fraction
- normal exercise tolerance, >10 metabolic equivalents (METS)
- absence of exercise-induced ischemia by exercise testing
- absence of exercise-induced complex ventricular arrhythmias
- absence of hemodynamically significant stenosis on all major coronary arteries ($\geq 50\%$ lumen diameter narrowing)".²¹

Based on this fire fighter's June 7, 2001 EST and his prior cardiac catheterization, he did not meet the criteria for items #3 and #5. According to NFPA 1582 guidelines, this fire fighter should not have been cleared to return to full active duty fire suppression.

RECOMMENDATIONS

The following recommendations address health and safety generally. It is unclear if any of these recommendations could have prevented the sudden cardiac arrest and subsequent death of this fire fighter. This list includes some preventive measures that have been recommended by other agencies to reduce the

risk of on-the-job heart attacks and sudden cardiac arrest among fire fighters. These recommendations have not been evaluated by NIOSH, but represent published research or consensus votes of technical committees of the NFPA or fire service labor/management groups.

Recommendation #1: Provide mandatory annual medical evaluations to ALL fire fighters consistent with NFPA 1582 to determine their medical ability to perform duties without presenting a significant risk to the safety and health of themselves or others.

Guidance regarding the content and frequency of periodic medical evaluations and examinations for fire fighters can be found in NFPA 1582, Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians,²¹ and in the report of the International Association of Fire Fighters/International Association of Fire Chiefs (IAFF/IAFC) wellness/fitness initiative.²⁴ The Department is not legally required to follow any of these standards. Nonetheless, we recommend the City and Union **work together** to establish the content and frequency in order to be consistent with the above guidelines. The FD currently provides annual medical evaluations, however, the evaluations are not consistent with NFPA 1582.

In addition to providing guidance on the frequency and content of the medical evaluation, NFPA 1582 provides guidance on medical requirements for persons performing fire fighting tasks. NFPA 1582 should be applied in a **confidential, nondiscriminatory** manner. Appendix D of NFPA 1582 provides guidance for Fire Department Administrators regarding legal considerations in applying the standard.

Applying NFPA 1582 also involves economic issues. These economic concerns go beyond the costs of

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administering the medical program; they involve the personal and economic costs of dealing with the medical evaluation results. NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, addresses these issues in Chapter 8-7.1 and 8-7.2.²⁵

The success of medical programs hinges on protecting the affected fire fighter. The Department must (1) keep the medical records confidential, (2) provide alternate duty positions for fire fighters in rehabilitation programs, and (3) if the fire fighter is not medically qualified to return to active fire fighting duties, provide permanent alternate duty positions or other supportive and/or compensated alternatives.

Recommendation #2: Fire Fighters should be cleared for duty by a physician knowledgeable about the physical demands of fire fighting and the various components of NFPA 1582.

Physicians providing input regarding medical clearance for fire fighting duties should be knowledgeable about the physical demands of fire fighting and familiar with the consensus guidelines published by NFPA 1582, Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians. To ensure private physicians are aware of these guidelines, we recommend that the Fire Department provide the private physicians with a copy of NFPA 1582. In addition, we recommend the Fire Department not automatically accept the opinion of the employee's private physician regarding return to work. This decision requires knowledge not only of the employee's medical condition, but also the employee's job duties. Frequently, private physicians are not familiar with an employee's job duties, or guidance documents, such as NFPA 1582. Lastly, we recommend that all return-to-work clearances be reviewed by the Fire Department physician/contracted physician. Thus, the final decision

regarding medical clearance for return to work lies with the Fire Department with input from many sources including the employee's private physician.

Recommendation #3: Incorporate exercise stress tests into the Fire Department's medical evaluation program.

NFPA 1582 and the IAFF/IAFC wellness/fitness initiative both recommend at least biannual EST for fire fighters.^{21,24} They recommend that these tests begin at age 35 for those with CAD risk factors and at age 40 for those without CAD risk factors. The EST could be conducted by the fire fighter's personal physician, the City physician, or the Department's contract physician. If the fire fighter's personal physician or the contracted physician conducts the test, the results must be communicated to the City physician, who should be responsible for decisions regarding medical clearance for fire fighting duties.

Recommendation #4: Provide fire fighters with medical evaluations and clearance to wear SCBA.

OSHA's Revised Respiratory Protection Standard requires employers to provide medical evaluations and clearance for employees using respiratory protection.²⁶ These clearance evaluations are required for private industry employees and public employees in States operating OSHA-approved State plans. Alabama is not a State-plan State; therefore, public sector employers are not required to comply with OSHA standards. However, we recommend following this standard, and a copy of the OSHA medical checklist has been provided to the Fire Department. Given the current periodic medical evaluation required by the Fire Department, this clearance should not involve any additional expense for the Fire Department.

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Recommendation #5: Provide exercise equipment in all fire stations.

Currently, 24 of the 30 fire stations have strength and aerobic exercise equipment. Also, fire fighters have access to the City Health and Fitness Center. NFPA 1583 recommends providing exercise equipment through the contracted use of a public gym or other facility, or placing the equipment directly in the fire stations.²⁷ Contracting the use of a facility requires a company (engine, ladder, etc.) of fire fighters to exercise at the same time daily at a location separate from their fire station. The gym should be centrally located, but due to emergency responses and daily work duties, the facility may not be convenient and thus, underutilized. The fire companies may also have to be taken out of service during the time of exercise, depending on the location of the facility. Even though this Fire Department has a mandatory wellness/fitness program, fire companies are not taken out of service (due to staffing levels) to participate in the program. To locate the equipment in the fire stations allows the fire fighters to exercise within the constraints of their daily work schedules and emergency responses while remaining more readily available for response.

Recommendation #6: Ensure that all members participate in the FD's mandatory wellness/fitness program.

Physical inactivity is the most prevalent modifiable risk factor for CAD in the United States.¹³ Additionally, physical inactivity, or lack of exercise, is associated with other risk factors, namely obesity and diabetes.²⁸ The Fire Department has a written, mandatory wellness/fitness program. However, compliance with the policy is not ensured. NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, requires a wellness program that provides health promotion activities for preventing health problems and enhancing overall

well-being.²⁵ In 1997, the International Association of Fire Fighters (IAFF) and the International Association of Fire Chiefs (IAFC) published a comprehensive Fire Service Joint Labor Management Wellness/Fitness Initiative to improve fire fighter quality of life and maintain physical and mental capabilities of fire fighters. Ten fire departments across the United States joined this effort to pool information about their physical fitness programs and to create a practical fire service program. They produced a manual and a video detailing elements of such a program.²⁴ The Fire Department and the Union should review these materials to identify applicable elements for their Department. Other large-city negotiated programs can also be reviewed as potential models.

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