

U.S. Fire Administration

Health and Wellness Guide

for the Volunteer Fire and Emergency Services

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FEMA



U.S. Fire Administration
Mission Statement

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EXECUTIVE SUMMARY

Firefighting is one of the Nation's most dangerous and hazardous jobs, with heart attacks, high physical stress levels, sprains, and strains all too common. Of all firefighters in the United States, 72 percent are volunteers.¹ The leading cause of on-duty death among volunteers is heart attack. The leading cause of injuries for all firefighters is overexertion and strain.²

The prevalence of cardiovascular illness and deaths and work-inhibiting strains and sprains among firefighters illustrates the need for a comprehensive health and wellness program in every department. The fire service realizes that health and wellness programs benefit individual firefighters and the fire and emergency services as a whole; such programs can yield safer and more effective action by first responders to emergencies.

Many organizations have addressed the issue of health and wellness in the fire service. The National Fire Protection Association (NFPA) redeveloped its health and wellness standards in 2003. Since 1997, several career departments have worked with the International Association of Fire Fighters (IAFF) and the International Association of Fire Chiefs (IAFC) on a wellness initiative. To address the issues specific to volunteers, the National Volunteer Fire Council (NVFC) developed this guide to health and wellness for volunteer departments and members. In 2003, the NVFC launched the ground breaking Heart-Healthy Firefighter Program specifically to address heart disease in the fire and emergency services. This awareness and prevention campaign targets all firefighters and emergency personnel—both volunteer and career.

Programs from Across the Nation

In 2003, the NVFC State directors and alternates identified 16 volunteer departments with experience in health and wellness programs. The departments used many different approaches to health and wellness, including screenings, examinations, immunizations, education, behavioral modifications, and fitness programming. Fewer than half of the departments stated that their programs were well received, and 10 departments noted culture as an impediment to the program. The three greatest problem areas identified were lack of funding, lack of well-defined requirements, and the inability to keep members motivated.

As this Guide details, budget constraints should not be a major barrier to the implementation of a comprehensive program. Many opportunities exist to help reduce or eliminate costs, such as developing partnerships. The Federal Emergency Management Agency (FEMA) Assistance to Firefighters Grant program is especially effective; grants are available to establish or expand wellness and fitness initiatives for firefighting personnel.

Education is the best option to counter concern among members about increasing their time requirements. Understanding the risks and consequences of not participating in a health and wellness program is a critical step in creating and implementing a successful program. When presented with comprehensive reasons why they should participate, many individuals often do so.

In the 1992 version of this guide, nine programs were featured as case studies; in 2003, seven of these departments updated their program status, and three additional departments were studied. Six of the previously profiled departments are featured in the 2008 Guide. They served as models for other volunteer departments, and many of the programs featured continue to be viable today. Only one has been reduced substantially from its original scope. These case studies, as well as new ones, also look at how to implement different program components and address the concerns.

Developing and Implementing a Health and Wellness Program

Planning is the most important step in implementing a health and wellness program. A vision is needed to provide guidance on how to develop and implement an individualized departmental program. There is no model plan that will work for all departments in all places, but there are model elements and core components that should be implemented, including

- regular health and fitness screenings and medical evaluations;
- fitness program (cardiovascular, strength, and flexibility training);
- behavioral modification (smoking, hypertension, diet, cholesterol, diabetes);
- volunteer education; and
- screening volunteer applicants.

In a program where all of these components are combined, the volunteers pay more attention to their personal health and wellness, which will improve the department overall. If a department cannot implement the entire program at once, it is far better to initiate some of these components than to do nothing.

A priority to ensure the program is successful is to appoint peer coordinators. The coordinators should be the advocates and leaders for the health and wellness program within the department. The coordinators might come from a steering committee or be identified by the department leadership.

Once the components have been selected and the program implemented, health and wellness needs to be made a priority if it is to become a part of the volunteer fire and emergency services culture. When department leadership and health and wellness coordinators actively advocate participation (in both words and actions), volunteers will see that the department has identified health and wellness as a priority and will be more likely to participate.

CHAPTER I: INTRODUCTION

Firefighting continues to be one of the Nation's most dangerous and hazardous jobs, with heart attacks, high physical stress levels, and sprains and strains all too common. In the past 5 years, the fire and emergency services have focused their attention on overcoming these issues by working to change their culture. The NFPA has spent much time redeveloping and revamping its health and wellness standards, while career departments have been working with the IAFF and IAFC on a wellness initiative that began in 1997. In 2003, the NVFC launched the Heart-Healthy Firefighter Program, a heart attack awareness and prevention campaign that offers resources and support to fire and emergency services personnel.

Volunteer personnel face risks similar to career personnel when it comes to health and wellness. Yet the nature of member time constraints and tight departmental budgets in the volunteer service often inhibits the creation of comprehensive health and wellness programs.

Implementing a comprehensive health and wellness program could overwhelm the resources of many volunteer departments. Time, lack of program leadership, and insufficient funding pose serious challenges to most departments, which often struggle to deliver basic fire suppression capabilities.

This Guide provides the rationale and suggestions for implementing a health and wellness program successfully in the volunteer fire and emergency services. It also addresses many common roadblocks. The chapters are divided to help volunteer departments develop a program from the ground up:

- **Chapter II: State of Health and Wellness in the Volunteer Fire and Emergency Services** looks first at current causes for injuries and deaths among first responders. It then examines current health and wellness programs and initiatives, resources implementing and sustaining them, and why many programs have not been sustained.
- **Chapter III: Importance of Health and Wellness in the Volunteer Fire and Emergency Services** summarizes, in layperson's terms, the science behind major injuries and fatalities among first responders. This summary should provide motivation for firefighters and emergency personnel to engage in health and wellness programs.
- **Chapter IV: Volunteer Programs from Across the Nation** looks at actual health and wellness programs and trends in volunteer departments. It includes programs from the first and second editions of this Guide, as well as new programs that have been developed.
- **Chapter V: Development of a Health and Wellness Program for Volunteer Fire and Emergency Services Departments** gives a step-by-step guide to developing a health and wellness program in a volunteer fire or emergency medical services (EMS) department. The chapter discusses common roadblocks faced by departments and other strategies to deliver a sustainable program.
- **Chapter VI: Implementing a Health and Wellness Program** brings together all of the recommendations presented throughout the Guide for developing a program.

This Guide ends with two appendices to offer more assistance with program development. Appendix A includes contact information for departments and resources, and additional references. Appendix B examines the relationship between cardiovascular risk factors and physical fitness.

CHAPTER II:

STATE OF HEALTH AND WELLNESS IN THE VOLUNTEER FIRE AND EMERGENCY SERVICES

Statistics show that firefighting is one of the most dangerous occupations in the world. Volunteer firefighter fatalities accounted for 73 percent of all firefighting-related deaths in 2006.³ In that year, stress was the leading cause of on-duty deaths among volunteer firefighters, leading to the death of 38 firefighters. Heart attacks were the direct cause of death in over 47 percent of on-duty volunteer firefighter fatalities.⁴ In both nature and cause, stress and heart attacks killed a higher percentage of on-duty volunteer firefighters than career firefighters, making clear the need for increased emphasis on cardiovascular health, physical fitness, and overall wellness in the volunteer emergency services.

In 2007, the USFA reported 118 firefighter fatalities. About half of those deaths were volunteers. Almost 50 percent of these deaths were from heart attack.⁵ These statistics underscore the health and wellness issues being addressed in this Guide, and show how current the problem is in today's volunteer fire and emergency services.

Many factors influence the occurrence of an injury, its severity, and its outcome. Without a doubt, the health of the individual sustaining the injury is one of the more important factors. Firefighting consists of periods of low activity punctuated by periods of intense, strenuous activity. Good physical condition is a critical component in the body's ability to transition successfully, without injury, between these two activity levels.

Undoubtedly, pre-existing medical conditions, including underlying medical conditions, as well as physical fitness, affect the health and safety of firefighters. The NFPA estimates that 83,400 firefighters were injured in the line of duty in 2006.⁶ Many on-duty deaths and injuries may have been avoided, or have been less severe, under the same conditions if there was no pre-existing condition.

Despite the known risks, thousands of volunteer firefighters and emergency medical personnel lack rudimentary medical evaluation and overall wellness that can ameliorate the physical stress of emergency response. According to the USFA publication, *Four Years Later-A Second Needs Assessment of the U.S. Fire Service*, only one quarter of the surveyed departments nationwide have a program to maintain basic first responder fitness and health, such as is encouraged by NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*.⁷

According to the study, a large number of firefighters serve as volunteers in smaller communities, where most fire departments do not have programs to maintain basic firefighter fitness and health. It is likely that implementing health and wellness programs in fire and emergency services departments could prevent or reduce volunteer injuries and deaths, since a body of evidence suggests that improved lifestyles reduce the risk of injury and death.

In 2008, the NVFC, in partnership with the USFA, completed a study entitled, "*Emerging Health and Safety Issues in the Volunteer Fire Services*." This report provides information on initiatives, programs, and strategies for reducing fatalities among volunteer firefighters and emphasizes the importance of a structured personal health and fitness program.

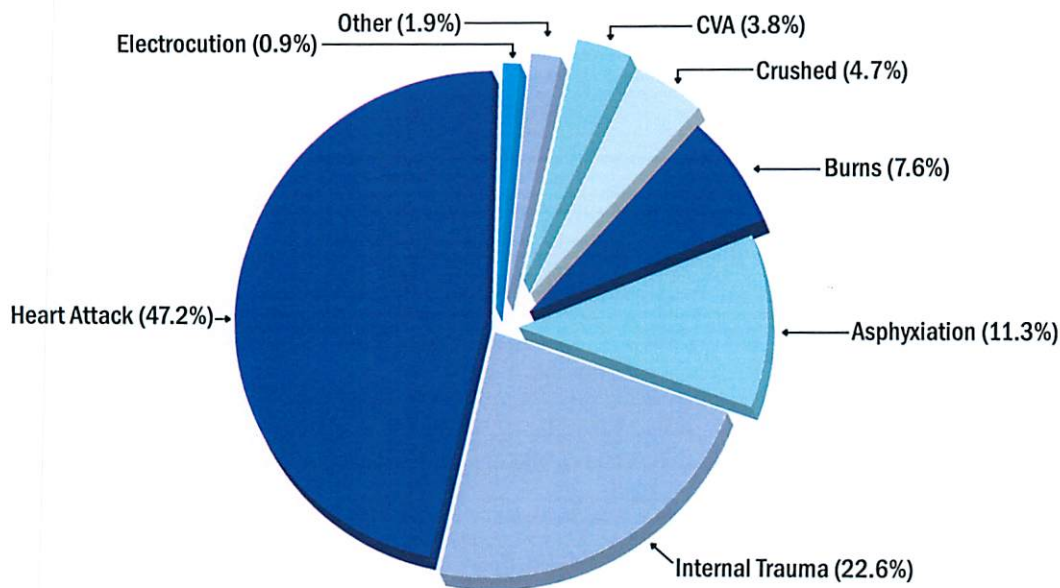
Overview of Health Concerns of Volunteer Firefighters

This section looks at the overall health concerns of volunteer firefighters and EMS personnel. A more detailed discussion of the benefits of a health and wellness program for firefighters and EMS personnel is provided in Chapter III. The discussion of health concerns is applicable to the fire and emergency services as a whole. The USFA death statistics are broken down by volunteer and career firefighters. Injury statistics encompass both collectively, and are not broken down by volunteer and career.

CARDIOVASCULAR HEALTH

As shown in Figure 1, heart attacks are the leading cause of firefighter fatalities, accounting for 47 percent of firefighter line-of-duty deaths in 2006. The number of firefighters, both career and volunteer, who suffer heart attacks while off duty remains untallied. The physical demands placed on firefighters can be very high; they often must go from a state of deep sleep to extreme alertness and high physical exertion in a matter of minutes. Further, they must carry heavy equipment through intense heat while wearing heavy protective gear. While many Americans are at risk for heart disease, the nature of firefighting requires that firefighters be particularly careful in maintaining a high level of physical fitness to combat coronary problems.

FIGURE 1: Fatalities by Cause of Fatal Injury (2006).⁸



Source: United States Fire Administration. "Firefighter Fatalities in the United States in 2006," July 2007.

The prevalence of heart attacks is a continuing problem. In 2006, "heart attacks were once again the number one cause of firefighter death."⁹ The USFA Firefighter Fatality Retrospective Study: 1990-2000 analyzed the causes of more than 1,000 on-duty firefighter deaths in the United States during the last decade of the 20th century and concluded that heart attack was the leading cause of death, accounting for 44 percent of firefighter line-of-duty deaths. Heart disease is also the leading cause of death in the United States, according to the American Heart Association.

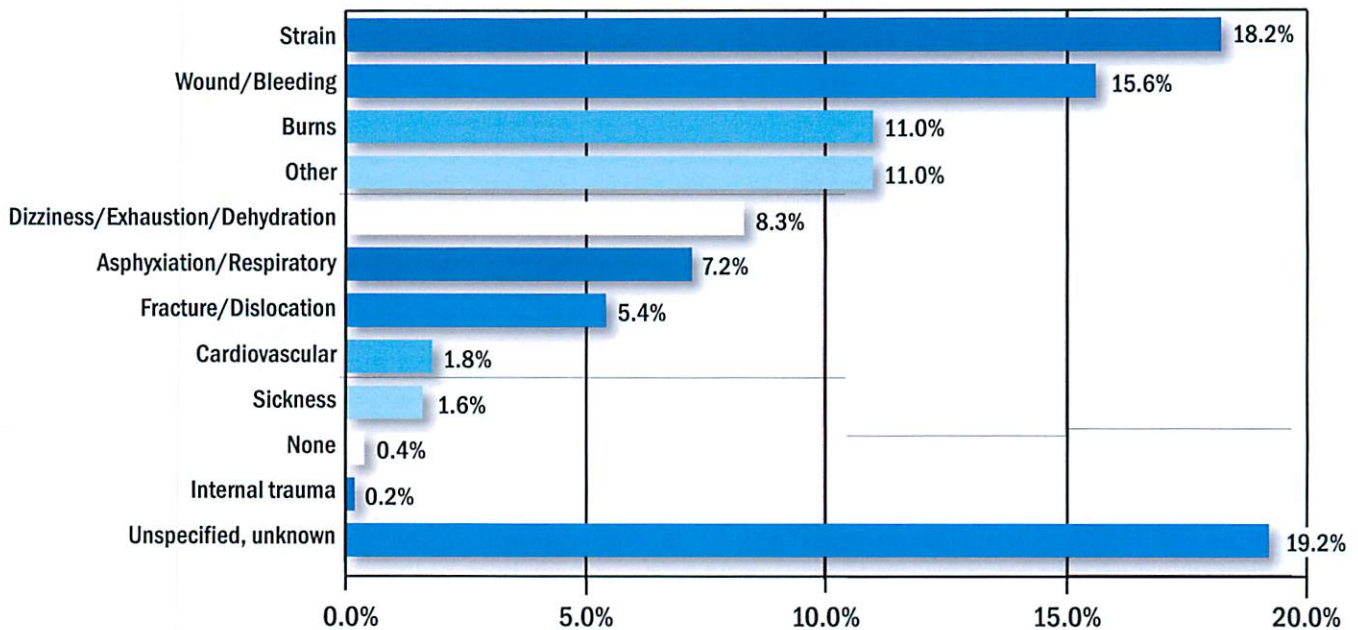
The cardiovascular state of health and wellness in the fire service is of such concern that researchers identified a correlation to the public's safety. The high-risk profile for cardiovascular disease of firefighters should be a national concern.¹⁰ Why firefighters should be concerned with cardiovascular disease and other risk factors is discussed in Chapter III.

STRAINS AND SPRAINS

As shown in Table 1, in 2004, sprains, strains, and muscular pains accounted for 18.2 percent of overall firefighter injuries and was the leading cause of injury.¹²

In most injury cases, sprains and strains are caused by pulling, lifting, and carrying hoses; pulling or maneuvering hand tools and saws; pulling and lifting property or contents; lifting and moving ladders; and lifting other items. Very often, sprains and strains are exacerbated by preexisting conditions, called Cumulative Trauma Disorders (CTDs). CTDs, which fall under the umbrella term “ergonomic-related disorders,” include tendonitis and nerve compression, conditions caused by continued, cumulative stress to certain joints, tendons, ligaments, and other body parts.¹³

TABLE 1: Firefighter Injuries by Nature of Injury.¹¹



Source: United States Fire Administration. "Fire-Related Firefighter Injuries in 2004," February 2008.

Other sprains and strains can be worsened by back disorders, a frequent source of pain and complaint among firefighters, and another category of injury falling under “ergonomic-related disorders.” Twisting, pushing and pulling, lifting, bending, and stretching can all cause such disorders, and even such a seemingly mundane action as continued sitting can be a problem. Regardless of the cause, pre-existing back disorders can result in more severe injuries among firefighters, especially in fireground situations.

STRESS LEVELS

A majority of the job-related activities in the fire and emergency services can be characterized as sedentary, e.g., equipment maintenance, building inspections, or public education. Active firefighting, on the other hand, is a tremendously strenuous task. The firefighter can be taken from a complete resting state and within minutes be thrust into a dangerous, complicated environment where he or she is expected to perform at a demanding physical level.

Firefighters face a potentially deadly combination of stress, heat and high body temperature, and dehydration. Repeatedly placing such stresses upon an individual can take its toll. In stressful situations, such as a fire, researchers note that the body responds with a number of physiological changes. More adrenaline is released into the bloodstream, muscles tense, breathing quickens, and heart rate and blood pressure rise. Researchers also note, however, that fit individuals tend to take these physical responses in stride and with less wear and tear to the body.¹⁴

WEIGHT PROBLEMS

In 2003, former Surgeon General Richard Carmona called obesity “the terror within, a threat that is every bit as real to America as the weapons of mass destruction.”¹⁵

Dr. Stefanos Kales, MD, a Harvard researcher, led a study that analyzed data on all firefighter deaths between 1994 and 2004, except those linked to the 9/11 terrorist attacks. According to Dr. Kales, “We found that firefighters were generally very fit going into the service but over the course of a number of years—because of not exercising regularly, not eating right—many are becoming obese.”¹⁶

An article in the *Journal of the American Dietetic Association* indicates that many overweight or obese firefighters may not even realize the potential problem.¹⁷ Physical conditioning is crucial in public safety jobs because physical and emotional stress is unavoidable.

Summary of the Importance of Health and Wellness

The importance of health and wellness and the need for developing and implementing health and wellness programs in departments can be summarized by the following 10 reasons:

1. **Improves heart health.** The importance of aerobic exercise cannot be overstated. Heart attacks cause the majority of deaths among on-duty firefighters. Regular aerobic exercise helps prevent heart disease, strengthens the heart muscle, decreases clotting, and stabilizes the electrical activity of the heart. Aerobic exercise slows plaque buildup in the arteries and also helps to normalize blood pressure, especially in people whose blood pressure is somewhat elevated.
2. **Improves heat tolerance.** Exercise increases blood volume, which improves heat tolerance. Improved heat tolerance helps firefighters battle more intense fires.
3. **Helps prevent Type II diabetes.** Exercise improves the body’s ability to regulate blood sugar, preventing Type II diabetes.
4. **Reduces risk of strains and sprains.** Physical activity strengthens the muscles and joints and other structures like tendons and ligaments that help hold the body together. This strengthening decreases the risk of strains and sprains—the leading cause of injury for firefighters.
5. **May improve emotional state.** Volunteer firefighters often deal with life-and-death situations when they respond to an emergency. Taking part in health and wellness programs improves their psychological and emotional states, which will improve emotional reactions during a life-and-death situation. An improved emotional state also improves self-esteem, self-efficacy, and sleep patterns, thereby reducing depression, anxiety, and stress.
6. **Maintains weight loss.** Exercise and proper nutrition help control body weight and are essential in any weight loss program. Weight loss is more likely to be maintained if a person continues to exercise. Weight loss increases stamina as well as aerobic abilities, both of which are needed for firefighting.
7. **Maintains metabolic rate.** By preventing the loss of metabolically active muscle tissue, exercise helps prevent the drop in metabolic rate that sometimes accompanies weight loss and the gradual decline in metabolic rate that occurs with aging.
8. **Enhances ability to fight fires.** Exercise can slow the loss of stamina, strength, flexibility, bone density, and metabolic rate, which all affect an individual’s ability to fight a fire.
9. **Prevents development of back problems.** Maintaining flexibility in the muscles of the legs and lower back and increasing strength in the abdominal and back muscles can help prevent the development of back problems. Back problems among firefighters often develop from lifting hoses and equipment and moving apparatus.
10. **Encourages overall healthy lifestyle.** As fitness and nutrition improves, activity becomes easier. Exercise increases stress resistance and improves sleep. An active lifestyle also encourages other health-promoting habits, such as avoiding tobacco and alcohol and developing healthy eating habits. Besides feeling better, firefighters lower their risk for injury or even death with more and consistent exercise.

Top Reasons Why Fitness Programs Have Not Worked

Despite the importance of health and wellness programs for the fire and emergency services, there are many obstacles to their inception and implementation. These obstacles must be addressed if first responder health is to be improved. Based on health advocate and former firefighter Michael Stefano's experience from administering a number of programs, the following are the five leading reasons for failure:¹⁸

1. **Lack of information on risk to self.** Many firefighters are not aware of the health risks of firefighting and, therefore are, uninterested in changing their condition. With many preventable injuries and deaths occurring annually, pertinent health information must be disseminated to motivate first responders to change their lifestyles.
2. **Lack of individual goals.** Programs that have failed to outline reasonable and specific individual goals are less likely to succeed. Program participants who feel they do not accomplish anything drop out. In developing any fitness program, the needs and wishes of the participants must be taken into account, and the participants must be able to see progress.
3. **Lack of appropriate training.** Fitness programs generally are not designed by professionals and thus lack the elements necessary for an effective program. While hiring a personal trainer may be too expensive for some volunteer departments, professional consultation should be sought to ensure the efficacy and safety of the program.
4. **Lack of time to devote to the program.** Volunteers already donate many hours to the fire and emergency services, and few feel they have excess time to devote to health and wellness. However, firefighter health is too important to ignore. Instead, fitness programs for volunteers should be designed around the members' personal and family time.
5. **Lack of motivation.** Even first responders aware of their elevated health risk choose not to participate in fitness programs. Lack of motivation is a serious challenge that must be addressed by each department. Chapter IV provides some suggestions.

Overview of National Fire Service Wellness Initiatives

The fire and emergency service's greatest asset is not equipment, apparatus, or stations, but rather its personnel. Through its personnel, departments serve the public, accomplish their missions, and are able to make a difference in the community. By committing to a wellness program, departments often increase their members' trust. This trust enhances every program and each call answered by the department. Placing a high priority on wellness makes sense for everyone, including fire and emergency service personnel, the taxpayers, and the public served.

NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS

In 2008, the NFPA released NFPA 1583, *Standard on Health-Related Fitness Programs for Fire Department Members*. As the NFPA states, "The purpose of this standard is to provide the minimum requirements for a health-related fitness program for fire department members that enhances the members' ability to perform occupational activities efficiently and safely and reduces the risk of injury, disease, and premature death.

"The health-related fitness program shall include the following components:

1. Assignment of a qualified health and fitness coordinator
2. Periodic fitness assessment for all members
3. Exercise training program that is available to all members
4. Education and counseling regarding health promotion for all members
5. Process for collecting and maintaining health-related fitness program data"¹⁹

When adopted, this standard can be a key component of any occupational safety and health program, and is a companion to NFPA 1582, *Comprehensive Occupational Medical Program for Fire Departments*, 2007 Edition.

Reprinted with permission from the NFPA 1583-2008: *Standard on Health-Related Fitness Programs for Fire Department Members* © 2008, National Fire Protection Association, Quincy, MA. This reprinted material is not the complete and official position of the NFPA on the referenced subject, which is represented only by the standard in its entirety.

NATIONAL VOLUNTEER FIRE COUNCIL HEART-HEALTHY FIREFIGHTER PROGRAM

Each year, heart attack is the leading cause of line-of-duty deaths for firefighters. In a proactive effort to reduce the number of firefighters dying from heart disease and keep the Nation's first responders healthy, the NVFC launched the Heart-Healthy Firefighter Program in 2003 to promote fitness, nutrition, and health awareness within America's fire and emergency services. It is the Nation's only heart attack prevention and awareness campaign targeted at all firefighters and EMS personnel, both volunteer and career.

As part of the program, the NVFC provides tools and resources to assist firefighters, EMS personnel, and their families in becoming and staying heart-healthy. More information about each of these resources is available on the Heart-Healthy Firefighter Web site at www.healthy-firefighter.org. Some of the tools and resources are

- **Trade Show Booth.** The NVFC brings its interactive booth to emergency service trade shows across the country. The NVFC has partnered with L&T Health and Fitness, an award-winning fitness management and health promotion company, to provide free health screenings to firefighters, EMS personnel, and their families. By the end of 2007, over 14,000 first responders had been screened for heart disease risk factors including blood pressure, cholesterol, and body composition. The booth also features cooking demonstrations to show attendees that heart-healthy cooking can be easy and taste great.
- **Web Site.** The Heart-Healthy Firefighter Program Web site at www.healthy-firefighter.org contains resources to help first responders, their departments, and their families on the road to heart health. The Web site offers information on heart basics, fitness, nutrition, and lifestyle choices, as well as customized features such as "Tools for Firefighters" and "Tools for Families." The site also contains tools to help implement and maintain a heart-healthy lifestyle including the Fired Up For Fitness Challenge, heart-healthy recipes, and motivational firefighter success stories.
- **Fitness Challenge.** The Fired Up For Fitness Challenge is an interactive program where firefighters and EMS personnel can design and implement their individual fitness program. Participants measure personal progress by recording their physical activity and results such as weight loss, as well as compare their progress with fellow first responders across the Nation. Participants also qualify for rewards as they reach certain benchmarks.
- **Cookbook.** The *Heart-Healthy Firefighter Cookbook* includes over 60 delicious yet healthy recipes that firefighters and EMS personnel can use either at home or at the station. Many of the recipes were submitted by firefighters who already have committed to becoming heart-healthy.
- **Resource Guide.** The *Heart-Healthy Firefighter Resource Guide* is available both in print form and for free download on the Heart-Healthy Firefighter Web site. The Guide contains all the information needed to start on the path to a heart-healthy lifestyle. Sections cover essential heart-health information, risk factors, and lifestyle choices.
- **Newsletter.** The *Pulse* is a printed, quarterly newsletter that includes ideas, resources, advice, and information to keep firefighters and EMS personnel healthy throughout the year. Readers also can contribute by submitting success stories about becoming heart healthy, ideas or suggestions about aspects of maintaining a heart-healthy lifestyle, or questions about the program or heart health.
- **E-news.** The *Heart-Healthy Firefighter E-news* is a monthly electronic newsletter that contains program and health news, tips for a heart-healthy lifestyle, upcoming events, and more.

In addition, the NVFC is developing two new components that will bring the Heart-Healthy Firefighter Program to the department level. The first is a Health and Fitness Advocate Program, designed to train fire and emergency services personnel on how to create and maintain an effective health and wellness program within their department, with a significant focus on heart-health. The second new component is the Adopt the Program initiative that allows firefighters and departments to register with the Heart-Healthy Firefighter Program to receive specific tools and information that they can follow to maintain a heart-healthy lifestyle. These include meal plans, fitness information, and tracking mechanisms to monitor progress.

INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS/INTERNATIONAL ASSOCIATION OF FIRE CHIEFS WELLNESS-FITNESS INITIATIVE

The International Association of Firefighters/International Association of Fire Chiefs (IAFF/IAFC) Joint Labor Management Wellness-Fitness Initiative (WFI) is an unprecedented endeavor to join together labor and management to evaluate and improve the health, wellness, and fitness of firefighters and emergency medical services (EMS) providers.

Ten U.S. cities and Canadian career fire departments participate in the WFI Task Force, which was first convened in 1996. The participating departments and their IAFF local affiliate have all formally committed to adopt the WFI and to continue participation in the program. A key aspect of the program is that it be implemented in full, not just selected components, although it is acceptable to implement one or two components at a time until full implementation is achieved. Although developed by career departments, the WFI can be implemented in career, combination, or volunteer departments.

The WFI is based on the premise that the program is mandatory, nonpunitive, and confidential. If a volunteer firefighter wellness program is to succeed, these same conditions should apply. According to the WFI manual, “all component results are measured against the individual’s previous examination and assessments and not against any standard or norm.” Confidentiality of medical information is the most critical aspect of the WFI. The unauthorized release of personal details which may be recorded as part of a medical evaluation causes legal, ethical, and personal problems for the employee, employer, and examining physician. All information obtained from medical and physical evaluations must be considered confidential, and the employer will only have access to information regarding fitness for duty, necessary work restrictions, and if needed, appropriate accommodations. Also, all medical information must be maintained in separate files from all other personnel information.

The 10 U.S. fire departments participating in the program are

- Austin Fire Department (Texas);
- Calgary Fire Department (Canada);
- Charlotte Fire Department (North Carolina);
- Fairfax County Fire and Rescue Department (Virginia);
- Indianapolis Fire Department (Indiana);
- Los Angeles Fire Department (California);
- Miami-Dade Fire Rescue Department (Florida);
- City of New York Fire Department (New York);
- Phoenix Fire Department (Arizona); and
- Seattle Fire Department (Washington).

All 10 of the departments have implemented the program to some degree, and numerous other departments have implemented the program as well. The third Edition of the WFI was released in August of 2008.

Components of the Wellness-Fitness Initiative. As seen in Table 2, the WFI has multiple components, all of which are designed to be implemented as a whole. In the case of the volunteer service, it would be quite challenging to implement all of these components at once. Many of the components are discussed in further detail in the chapter on developing a model program, later in this guide. In addition to the information provided in Table 2, the third edition of the WFI now contains chapters on cost justification, demonstrating the cost/benefits of implementing the WFI, and an implementation chapter that includes additional resources designed to assist the department in setting up the WFI.

TABLE 2: Components of the International Association of Fire Fighters - International Association of Fire Chiefs Initiative.

Category	COMPONENTS
MEDICAL	<ul style="list-style-type: none"> • Physical Evaluation • Body Composition Evaluation • Laboratory Tests • Vision Tests • Hearing Evaluations • Spirometry • Electrocardiogram • Cancer Screening • Immunizations and Infectious Disease Testing • Referrals • Data Collection
FITNESS	<ul style="list-style-type: none"> • Medical Clearance • Onduty Time for Exercise • Equipment and Facilities • Exercise Specialists and Peer Trainers • Fitness Incorporated into Philosophy • Fitness Evaluations (aerobic capabilities, flexibility, muscular strength, muscular endurance) • Fitness Self-Assessments • Exercise Prescriptions
REHABILITATION	<ul style="list-style-type: none"> • Need for Rehabilitation • Rehabilitation as a Priority • Establishment of a Medical Liaison • Physical Therapy Services • Clinical Pathways • Alternate Duty • Injury Prevention Program
BEHAVIORAL HEALTH	<ul style="list-style-type: none"> • Professional Assistance • Nutrition • Tobacco Use Cessation • Employee Assistance Programs • Substance Abuse Intervention • Stress Management • Critical Incident Stress Management • Chaplain Services

Candidate Physical Ability Test (CPAT). This program was developed as a fair and valid evaluation tool to assist in the selection of firefighters, and to ensure that all firefighter candidates possess the physical ability to complete critical tasks effectively and safely. The CPAT Program covers every aspect of administering the CPAT, including recruiting and mentoring programs, providing recruits with fitness guidance to help prepare them for the CPAT, and setting up and administering the test. In our ongoing effort to ensure that the CPAT is being used properly and only as intended, the IAFF has enacted a formal licensing policy that will affect the way in which this program can be used legally.

Peer Fitness Trainers. The IAFF/IAFC Wellness-Fitness Task Force has determined that successful implementation of the Wellness-Fitness Initiative and the CPAT programs require a trained firefighter in each department who can take the lead. These individuals must have the ability to design and implement fitness programs, to improve the wellness and fitness of his or her department, to assist with the physical training of recruits, and assist the broader community in achieving wellness and fitness (e.g., fitness programs in schools). This need for a department-level leader led to the development of the Fire Service Peer Fitness Trainer (PFT) certification program. The PFT certification is provided and sponsored by the IAFF/IAFC with the American Council on Exercise (ACE).

This certification provides fire department personnel with the knowledge needed to develop exercise programs for other department personnel. PFTs also learn WFI testing protocols, how to proctor the CPAT, and are helpful in promoting wellness and fitness throughout their departments. Since the program's inception in 2004, 144 workshops in 34 States, Washington, DC, and three Canadian provinces have been conducted with over 4,200 firefighters participating in the certification classes and sitting for the certification exam. For more information on the PFT course, visit http://www.iaff.org/HS/PFT/peer_%20index.htm

U.S. AIR FORCE PHYSICAL FITNESS PROGRAM

The U.S. Air Force Fitness Program was launched on January 1, 2004. This program replaces the annual ergo-cycle test that the Air Force had previously used for several years. The following requirements are for after basic training and technical school. Recruits in basic training and non-prior-service recruits in technical school continue to be tested using basic training standards.

Under the U.S. Air Force Fitness Program, fitness points are awarded in four areas: aerobic (running), body composition, pushups, and crunches. Those who are not medically cleared to run take the ergo-cycle test for the aerobic portion. Ratings are Excellent (90 or above), Good (75 to 89.9), and Fail (below 75). Individuals who fail must be re-tested within 90 days. In 2007, the Air Force announced that fitness test results (pass/fail) will be included on all future performance reports, so failing the fitness test can have a significant negative impact on an Air Force member's career (promotions, assignments, retention, etc.).

Members must complete all components unless medically exempted. If medically exempted from any component, the total score is calculated as the total component points achieved times 100, divided by the total number of possible points. The maximum component points are: aerobic (50), body composition (30), pushups (10), and crunches (10). Results are then compared to male and female fitness component charts.²⁰

CHAPTER III:

IMPORTANCE OF HEALTH AND WELLNESS IN THE VOLUNTEER FIRE AND EMERGENCY SERVICES

Chapter II looked at the state of health and wellness in the volunteer fire and emergency services. As the statistics showed, heart attacks represent the leading cause of on-duty death, while sprains and strains represent the number-one cause of injuries. This chapter will look at why it is important for volunteer firefighters and emergency medical personnel to reduce their risk of these health issues.

Cardiovascular Disease

Cardiovascular disease (CVD) is the leading cause of death in the United States, accounting for approximately 650,000 deaths per year.²¹ It exacts a considerable toll on the fire service, as shown in the previous chapter.

USFA and the NVFC aim to reduce drastically the number of firefighter deaths due to heart attacks. A commitment to health and safety requires that the fire and emergency services continue to address line-of-duty deaths due to other causes through proper training, adequate resources, etc. This Guide, however, is aimed at improving first responder health and safety by addressing the important health issue of CVD in the fire and emergency services. This chapter outlines the development of CVD, the risk factors for developing it, the relative risk associated with different values for each risk factor, and the benefits of exercise in controlling risk factors.

CVD refers collectively to a state of disease in the blood vessels. If blood vessels become narrowed (i.e., by the buildup of plaque) or obstructed (i.e., by a blood clot), then blood and the oxygen and nutrients it carries, cannot be delivered to the vital organs of the body. If blood flow to the heart muscle is impeded, a heart attack occurs. The terms coronary heart disease (CHD) or coronary artery disease (CAD) describe a specific form of CVD in which the blood vessels supplying the heart muscle are blocked.

When there is an obstruction in a coronary vessel, the tissue below the blockage does not get adequate oxygen. If the lack of oxygen (called ischemia) is too severe, the heart tissue dies (called an infarction; a myocardial infarction means death of heart muscle tissue). Thus, a person who has suffered a myocardial infarction (also called a heart attack) has had a portion of the heart tissue destroyed. If the area supplied by the blood vessel is very small, the person may recover from the heart attack or may not even know that he or she has suffered a heart attack. However, if the area below the occlusion is too great, the heart cannot continue to function as an effective pump, and death results.

Atherosclerosis refers to the disease condition in which plaque builds up in the arterial wall causing the size of the vessel opening to become narrower. The initiation of atherosclerotic plaque buildup may begin quite early in life. In fact, there is strong evidence that it begins in the early 20s for many people in developed countries of the Western world. Therefore, it is important to think of CVD as a long-term disease that begins early in life, although symptoms are often delayed until middle or older age. Also, CVD can reach advanced stages without overt symptoms. In many individuals, the first sign of CVD is a fatal heart attack, thus reinforcing the need for young first responders to take steps to avoid or delay atherosclerosis. It also suggests that all firefighters and EMS personnel should seriously address the health issues of CVD, even if they are symptom-free.

A health risk factor is a characteristic that is present early in life and is associated with an increased risk of developing future disease. A modifiable risk factor is a risk factor that can be minimized by diet, exercise, or personal habits. There are several risk factors for CVD, including nonmodifiable and modifiable ones (see Table 3). The nonmodifiable risk factors include gender, age, race, and family history. Men are more likely to suffer CVD at a younger age than females; thus, being over 45 years is considered a risk factor for males, and being over 55 years is a risk factor for females. Family history is defined as the premature death (before 55 years for males or before 65 years for females) of a parent or sibling from CVD.

TABLE 3: Risk Factors for Developing Cardiovascular Disease.

Risk Factors That Cannot be Modified	Risk Factors That Can be Modified
<ul style="list-style-type: none"> • Age • Heredity • Race • Gender 	<ul style="list-style-type: none"> • Cholesterol-lipid fractions • Cigarette smoking • Diabetes mellitus • Hypertension • Obesity • Physical inactivity

Modifiable risk factors deserve a great deal of attention because, when they are altered, an individual can influence his or her likelihood of developing CVD. There are six major modifiable risk factors: smoking, hypertension (high blood pressure), hypercholesterolemia (high cholesterol levels), diabetes or impaired glucose tolerance, obesity, and physical activity. The more risk factors that an individual has, the greater the likelihood he or she will suffer from CVD.

SMOKING

Approximately 21 percent of the adult population in the United States smoke, and approximately 4,000 young people begin to smoke each day.²² Cigarette smoking accounts for an estimated 438,000 deaths per year in the United States, more than 20 percent of them due to cardiovascular disease.²³ In fact, as early as 1983, the Surgeon General established smoking as the leading avoidable cause of CVD. Thus, quitting cigarette smoking is one of the most important interventions possible to decrease the risk of premature death due to CVD. Smoking increases the risk for sudden cardiac death, aortic aneurysm, peripheral vascular disease, and stroke. Smoking one pack of cigarettes per day doubles the risk of CVD compared to not smoking.²⁴ As the number of cigarettes smoked increases, so does the risk of coronary artery disease and stroke.

HYPERTENSION

Hypertension refers to a chronic, persistent elevation of blood pressure. Epidemiological data shows that the risk of death doubles with a systolic blood pressure greater than or equal to 140 mmHg and a diastolic blood pressure greater than or equal to 90, and thus a blood pressure above 140/90 is defined as hypertension. The risk of developing CVD increases directly with increasing levels of both systolic and diastolic blood pressure. Untreated hypertension can lead to stroke, heart attack, heart failure, and kidney damage.²⁵

The primary lifestyle modifications to help reduce hypertension include smoking cessation, diet and exercise, with the overall goals of losing weight, increasing physical activity levels, and decreasing salt intake. A program of regular aerobic exercise results in a decrease of approximately 10 mmHg in systolic and diastolic blood pressure in hypertensive individuals.²⁶ Exercise also helps control blood glucose levels and the ability of blood vessels to change diameter during exercise.

HIGH CHOLESTEROL

Blood lipids are comprised primarily of triglycerides and cholesterol. Cholesterol and triglycerides are carried in the blood by a lipoprotein molecule. Low-density lipoproteins (LDLs), also known as “bad cholesterol”, and high-density lipoproteins (HDLs), also known as “good cholesterol”, vary in their densities and in the way they transport cholesterol. Elevated levels of triglycerides, cholesterol, and LDL-cholesterol are associated with increased risk of CVD. On the other hand, increased levels of HDL-cholesterol are associated with a decreased risk of CVD. Therefore, elevated levels of HDL are desirable—they actually help decrease the risk of CVD.

Elevated levels of cholesterol in young adults greatly increase their risk of CHD later in life. In fact, young men who are in the upper quartile (highest 25 percent for cholesterol levels) have a nine-fold increase in risk of heart attack compared to men in the lowest quartile (lowest 25 percent).²⁷ The risk of CVD increases progressively with increasing levels of cholesterol; there is a 20- to 30-percent increase in risk for CHD for every 10 mg/dl increase in cholesterol.²⁸ Exercise is an important component of any weight loss program and weight loss is associated with positive changes in lipid profiles. Furthermore, regular aerobic exercise decreases triglyceride levels and increases HDL levels.

OBESITY

Despite what seems to be an obsession with thinness and dieting, approximately 33 percent of the adult population in the United States is obese, and another 30 to 35 percent of the population is overweight.²⁹ Obesity is associated with a number of diseases, including CVD (high blood pressure, dyslipidemia (altered or dysfunctional levels of lipids in the blood)), diabetes, gallbladder disease, and cancer. Obesity is associated with several other risk factors but it does appear that it also exerts an independent influence on the risk of CVD.

As excess body weight increases so does the risk of CVD.³⁰ There is little or no change in mortality at the lower end of the range (Body Mass Index (BMI) less than 25), but as BMI increases above 25, risk increases substantially. Thus, each incremental pound gained (once a person is categorized as overweight) is associated with additional risk.

Studies have consistently shown that exercise is particularly effective in maintaining weight loss. Additionally, exercise is the best way to lose fat and maintain muscle mass. When a person loses weight through diet alone, he/she loses fat and muscle. On the other hand, a person who loses weight through a combination of diet and exercise loses fat weight almost exclusively.

DIABETES

Diabetes is a metabolic disorder characterized by the inability to use sugar (glucose) effectively. Individuals with diabetes have a 300 percent to 500 percent increased risk of cardiac events. According to the American Diabetes Association, 65 percent of all deaths among diabetic patients are from heart disease or stroke.³¹

The degree of cardiovascular risk is directly related to fasting blood glucose levels.³² Additionally, individuals who have diabetes along with other risk factors are at much higher risk than nondiabetic individuals with the same number of risk factors. Diabetes often coexists with other risk factors for CVD. In fact, the cluster of risk factors has been termed metabolic syndrome X, and includes abdominal obesity, hypertension, dyslipidemia, and an inability to effectively use glucose (diabetes). Therefore, it is important that persons with diabetes very aggressively control other risk factors; they should lose excess body weight, exercise regularly, and eat a diet low in simple sugars and carbohydrates.

PHYSICAL INACTIVITY

Physical inactivity is related to several of the risk factors discussed previously. A lack of exercise increases an individual's risk of obesity, hypertension, dyslipidemia, and diabetes. However, physical inactivity is also an independent risk factor for CVD. The risk of CVD in inactive people is about twice that of physically active individuals; approximately the same as for hypertension and high cholesterol.³³ In fact, physical inactivity is responsible for approximately 200,000 deaths per year in the United States.³⁴ Numerous studies have shown that CVD mortality is inversely related to level of physical activity or fitness.³⁵

SUMMARY

CVD is a major threat to the health and safety of firefighters and EMS personnel. To stay healthy and address the risk factors for developing CVD, first responders should adopt a few healthy lifestyle habits. In short, to reduce the risk of suffering a heart attack or stroke, it is imperative that firefighters:

- do not smoke;
- follow a regimen of moderate aerobic exercise; and
- eat a balanced diet, avoiding excess saturated fats, excess simple sugars, and maintaining normal body weight.

Table 4 details the recommendations above and indicates the risk factors that are influenced by each recommendation. Of particular note is the benefit physical activity has on five of the six modifiable risk factors. Imagine the excitement within the fire and emergency services, indeed the Nation, if a medication were developed that could achieve half the benefits that we know can be derived from consistent participation in a moderate exercise program!

TABLE 4: Recommendations for Decreasing CVD Risk Factors.

Recommendations	Risk Factor Influenced
Exercise Moderately	<ul style="list-style-type: none"> • Decreased blood pressure • Improved lipid (cholesterol) profile • Decreased body fat • Improved glucose tolerance • Eliminates physical inactivity
Eat a Balanced Diet	<ul style="list-style-type: none"> • Improved lipid (cholesterol) profile • Decreased body weight • Improved glucose tolerance • May decrease blood pressure
Do not Smoke	<ul style="list-style-type: none"> • Decreased artery blockage • Increased lung health capacity

Importance of Improved Strength and Flexibility

Strength and flexibility training can effectively develop musculoskeletal strength, musculoskeletal endurance, and functional movement around the joints, and is strongly recommended for health, fitness, injury prevention, rehabilitation, and for improving one’s overall quality of life.

Flexibility is the ability to move a joint freely through an entire range of motion. As an example, good shoulder flexibility should allow both hands to touch together behind your back. It is, however, joint-specific, varying significantly across joints and between individuals. Many factors including joint structure, ligaments, tendons, muscles, skin, fat tissue, body temperature, gender, and age all contribute to the range of motion at a joint.³⁶