

NATIONAL VOLUNTEER FIRE COUNCIL

# HEART-HEALTHY FIREFIGHTER RESOURCE GUIDE

THIRD EDITION



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**While firefighting is physically and mentally demanding, volunteering to serve your community is rewarding and vital work. As a volunteer firefighter, you make a meaningful difference by providing critical help, protecting property, and saving lives in your communities. Your bravery and dedication are deeply valued.**

Along with the numerous benefits of being a volunteer firefighter, there are some risks. Firefighters face higher risks of heart attacks and strokes due to the intense physical exertion, job-related stress, and exposure to smoke and toxic substances. Heart disease remains the leading cause of on-duty death among firefighters, accounting for nearly half of all fatalities each year. Understanding and managing these health risks is essential to protecting your wellbeing and ensuring you can continue serving your community for years to come.

This guide provides practical strategies to manage these risks, reduce your chances of cardiovascular disease, and support your overall health so that you can **continue to do the important work you love.**



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# KNOW THE WARNING SIGNS OF CARDIOVASCULAR DISEASE

## Common Symptoms for Men:

- Chest pain or tightness
- Pain or discomfort in the arms, shoulders, jaw, neck, or back
  - Shortness of breath
- Dizziness or lightheadedness
- Nausea or cold sweats

## Common Symptoms for Women:

- Chest pain or discomfort (sometimes milder)
- Shortness of breath (may occur without chest pain)
- Unusual fatigue or weakness
- Pain in the jaw, back, or neck
- Nausea, vomiting, or flu-like symptoms
  - Anxiety or dizziness



## DID YOU KNOW?

Heart disease is the #1 cause of firefighter fatalities, responsible for nearly half of all on-duty deaths. **Prioritizing heart health saves lives.**

# ASSESS YOUR RISK

## WHAT IS CARDIOVASCULAR DISEASE (CVD)?

CVD refers to a range of conditions affecting the heart and blood vessels, including coronary heart disease, high blood pressure (hypertension), and high cholesterol. Firefighters are particularly at risk because of the strenuous physical exertion required during emergency response, exposure to smoke and harmful chemicals, irregular sleep schedules, and the stress associated with emergency response.

Symptoms of coronary heart disease can vary widely, from no discomfort at all to chest pain, shortness of breath, or even a sudden heart attack or cardiac arrest. These signs and symptoms may look different for men and women and are sometimes less obvious or less likely to be recognized as heart-related in some individuals.

## CORONARY HEART DISEASE

Heart attacks occur when blood flow to the heart muscle is severely reduced or blocked, often due to a buildup of plaque in the arteries. This blockage can result in damage to or death of the heart muscle. Strokes happen when blood flow to the brain is interrupted, either due to blockage or bleeding in the brain. The intense stress, physical demands, and exposure to toxic environments that firefighters experience increase their risk for both heart attacks and strokes.

Understanding these risks is crucial for protecting your health and maintaining your ability to serve your community safely.

Sudden cardiac events remain the leading cause of on-duty deaths for firefighters, accounting for nearly half of all firefighter fatalities each year. This risk impacts both volunteer and career firefighters, underscoring the critical importance of cardiovascular health across the entire fire service. The strenuous and unpredictable nature of emergency response significantly increases the physical demands placed on the heart, highlighting the urgent need for comprehensive heart-health strategies within fire departments nationwide.

# BLOOD PRESSURE

The 2025 blood pressure guideline released by the American College of Cardiology and the American Heart Association builds on — and updates — the major changes first introduced in 2017. While the definition of hypertension continues to use the lower 130/80 mmHg threshold established in the prior guideline, the 2025 update places stronger emphasis on earlier intervention, more precise cardiovascular risk assessment, and expanded guidance for special populations. A notable change is the adoption of the PREVENT™ cardiovascular risk calculator, replacing the older Pooled Cohort Equation and supporting more individualized treatment decisions. The new guideline also reinforces the importance of accurate measurement, home blood pressure monitoring, and lifestyle modification, while encouraging earlier use of medication — particularly for adults with persistent Stage 1 hypertension who do not respond to lifestyle changes within 3–6 months. Updated categories for blood pressure levels continue to guide classification and treatment (see box).

## Know Your Numbers! Blood Pressure Guidelines

-  **Normal:**  
Less than 120/80 mm Hg
-  **Elevated:**  
120 – 129/<80 mm Hg
-  **High (Stage 1):**  
130 – 139/80 – 89 mm Hg
-  **High (Stage 2):**  
140+/90+ mm Hg
-  **Crisis:**  
180+/120+ mm Hg  
(Seek immediate medical help!)

# CHOLESTEROL

Firefighters face an increased risk of heart disease, and high cholesterol can make that risk even more dangerous. Too much “bad” LDL cholesterol can build up in the arteries, reducing blood flow and making heart attacks more likely during intense physical activity. Since high cholesterol has no symptoms, regular screenings are important, especially for firefighters. Eating a heart-healthy diet, exercising regularly, avoiding tobacco, and maintaining a healthy weight can help keep cholesterol in check. Knowing your numbers and making small changes can go a long way in protecting your heart.

# PREVENTING CVD

There are several practical steps you can take to protect your heart. Small changes in daily habits — like quitting tobacco products or smokeless tobacco, getting regular physical activity, eating a balanced diet, and prioritizing good sleep — can have a big impact on your cardiovascular health. Avoiding or limiting alcohol, vaping, and other substances also helps reduce strain on your heart and supports your overall wellbeing. Together, these actions not only lower your risk of heart disease and stroke but also help you stay strong, focused, and ready to perform on the job. Making your health a priority today can protect your future in the fire service.

## Modifiable risk factors:

-  Smoking/Tobacco Use
-  Poor Diet
-  High Blood Pressure
-  High Cholesterol
-  Diabetes
-  Physical Inactivity
-  Being Overweight/Obesity
-  Irregular Sleep

## Non-modifiable risk factors:

- Age — 45 or older for men; 55 and older for women
- Sex/gender
- Family history of CVD
  - Father or brother diagnosed before age 55
  - Mother or sister diagnosed before age 65
- Race/ethnicity

## PHYSICAL FITNESS

Regular exercise is vital for heart health. Physical activity improves brain health, helps manage weight, reduces the risk of many chronic diseases (like heart disease, stroke, type 2 diabetes, and certain cancers), strengthens bones and muscles, and improves mental health and mood. Emphasize functional fitness, which refers to exercise programs designed to improve the physical capabilities needed for the specific tasks firefighters perform on the job. Functional fitness builds strength, endurance, flexibility, and cardiovascular health to enhance the ability to perform essential firefighting tasks safely and effectively.

To incorporate more physical activity, aim for the following:

- Get at least 150-300 minutes per week of moderate-intensity activity such as brisk walking or cycling.
- Engage in strength training at least two days per week.
- Incorporate physical activities into your daily routine (stairs instead of elevators).
- Emphasize functional fitness.
- Participate in fitness programs through your community, department, or gym.
- Remember, even short bursts of activity throughout the day make a difference.

# EATING FOR HEART HEALTH

A balanced diet reduces your risk of obesity, diabetes, and high cholesterol — all factors in heart disease. The following tips help promote a healthier diet:

- Focus on whole foods like fruits, vegetables, whole grains, lean proteins, and low-fat dairy instead of processed foods.
- Limit sugary snacks, high-fat foods, and processed meats.
- Stay hydrated, but limit energy drinks and high-caffeine beverages.
- The FDA suggests limiting daily caffeine intake to approximately 400 milligrams — that's about two to three 12-fluid-ounce cups of coffee.
- Limit saturated fats, sugar, and sodium.
- Eat smaller meals more frequently to maintain energy and metabolism.
- Use caution with workout supplements — some contain high levels of caffeine, stimulants, or unregulated ingredients that may increase heart risk. Always review labels and consult with your healthcare provider before use.

# SLEEP

Sleep is essential for firefighter health, performance, and safety. Good sleep helps your body recover from physical and mental stress, improving decision-making, reaction time, and overall job readiness. Regular, restful sleep also significantly reduces your risk of CVD by lowering blood pressure, reducing inflammation, and helping control weight, blood sugar, and cholesterol levels. For firefighters, prioritizing sleep is critical to maintaining both immediate operational effectiveness and long-term heart health.

Strategies to improve sleep include the following:

- Try to maintain regular sleep/wake times to enhance alertness and readiness for emergencies.
- Aim for 7 – 9 hours of sleep each night as recommended by The American Academy of Sleep Medicine and the National Sleep Foundation.
- Avoid or limit electronics, caffeine, alcohol, nicotine, and marijuana use, especially 1 – 2 hours prior to going to bed to prevent sleep disruptions.
- Create a quiet, cool, dark, and comfortable space to improve sleep quality and recovery.

# THE IMPACT OF TOBACCO AND MARIJUANA USE ON HEART HEALTH

The health impacts of smoking are well known, including being a major risk factor for heart attack and stroke. However, in recent years there are emerging concerns about the use of smokeless tobacco and vaping, both of which are prevalent within firefighter communities. While often perceived as less harmful alternatives to traditional smoking, these substances carry significant risks. Smokeless tobacco use has been associated with an elevated risk of oral, throat, and pancreatic cancers, as well as an increased likelihood of developing heart disease and hypertension. Similarly, vaping or the use of electronic cigarettes has been linked to adverse cardiovascular effects and respiratory issues, potentially exacerbating firefighters' existing occupational exposure risks.

Additionally, as legislative and societal norms evolve, marijuana use has become more widespread, prompting new health considerations within the firefighting community. The legalization and increased acceptance of marijuana use in many regions have not been without implications for firefighter health, particularly regarding cardiovascular and cognitive functions critical to firefighting performance and safety. Marijuana use can impair cognitive function, judgment, and reaction time, increasing the risk of accidents during high-stress firefighting operations. Furthermore, long-term cannabis use has been linked to respiratory issues, heart problems, and mental health concerns, potentially compounding existing occupational risks faced by firefighters.

These emerging health trends underscore the necessity for enhanced education and preventive measures within firefighting departments, including targeted health screenings, comprehensive wellness programs, and proactive education efforts to address the risks associated with tobacco use, vaping, cannabis, and other substance use. By better understanding and mitigating these risk factors, fire service organizations can more effectively promote the long-term health and operational effectiveness of their personnel.

## Examples of Smokeless Tobacco Devices



E-Pipe



E-Cigar



Tank or Cartridge



JUUL



E-Cigarette



Combustible Cigarette

*Image. OpenAI. (2025). Image of examples of "smokeless tobacco" [Digital Image]. Generated using ChatGPT and DALL-E.*

Here are some tips for quitting tobacco:

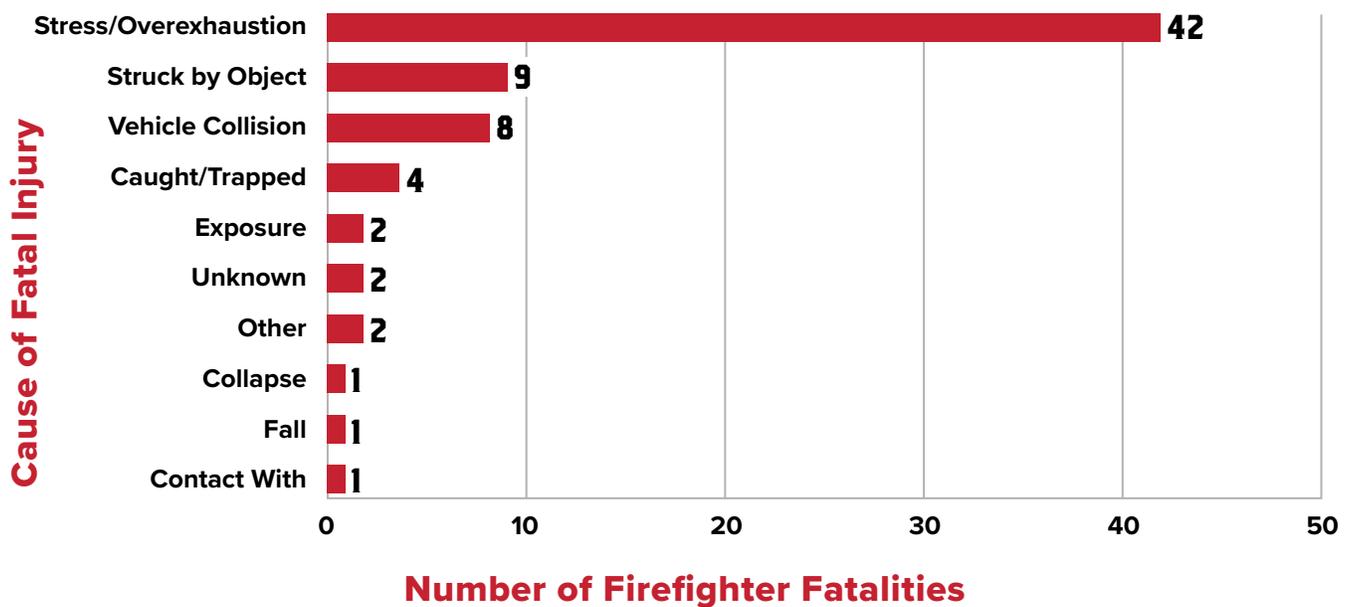


[www.nvfc.org/tobacco](http://www.nvfc.org/tobacco)

- Pick a quit date and commit to it.
- Inform your family and friends and ask for support.
- Use nicotine replacement therapy or medications prescribed by your doctor.
- Find healthy distractions when cravings hit (e.g., exercise, hobbies).
- Stay motivated — remember your health is worth it!
- Check out this resource from Science to the Station: [www.science2station.org/quitspit-manual](http://www.science2station.org/quitspit-manual)



# ON-DUTY FIREFIGHTER FATALITIES BY CAUSE OF FATAL INJURY (2024)



Source: US Fire Administration, Firefighter Fatalities in the United States in 2024. Released May 2025.

# INTEGRATED HEALTH RISKS

Firefighters face unique health challenges due to occupational hazards such as smoke exposure, extreme heat, shift work, and high physical and mental stress. In addition to CVD, these conditions increase the risk for diabetes, hypertension, lung disease, various types of cancer, and other chronic diseases. Many of these illnesses share **common risk factors** — like poor nutrition, lack of sleep, tobacco use, and physical inactivity — that can be made worse by the demands of the job. Understanding how these risks are **connected** is key to identifying the steps you can take to protect your health. Regular check-ups, health screenings, and using personal protective equipment (PPE) consistently can help catch problems early and reduce your exposure to harmful conditions.

## COMMON RISK FACTORS:

The following risk factors contribute to increased health challenges in firefighters.



Smoking/  
Tobacco use



Poor  
Diet



High Blood  
Pressure



High Cholesterol



Diabetes



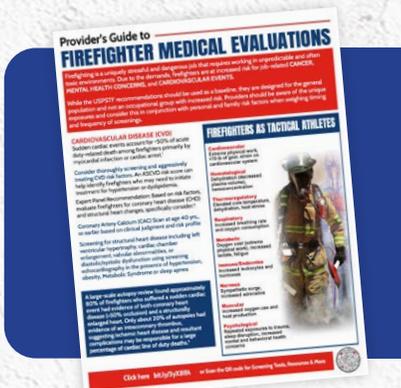
Physical  
Inactivity



Being Overweight/  
Obesity



Irregular Sleep



Download and bring this Provider's Guide to your doctor to talk about health concerns and the screenings recommended for firefighters.

[www.science2station.org/providers-guide-to-firefighter-medical-evaluations-copy](http://www.science2station.org/providers-guide-to-firefighter-medical-evaluations-copy)

Recognizing these **interconnected** conditions enables fire service organizations to design comprehensive preventive and wellness initiatives tailored to firefighters' unique occupational health risks.

This also allows individual firefighters to focus on modifying personal risk factors.

## CANCER

In addition to being at heightened risk for cardiovascular disease, firefighters have also been shown to experience elevated risks for various types of cancer. The International Agency for Research on Cancer (IARC), a specialized agency within the World Health Organization, officially classified occupational exposure as a firefighter as a Group 1 carcinogen in 2022. This classification indicates that there is sufficient scientific evidence demonstrating a causal link between firefighting activities and increased cancer risk.

The IARC classification was based on comprehensive evidence showing that firefighters face elevated risks for several types of cancer, including mesothelioma and cancers of the bladder, colon, prostate, skin, and lungs. These cancers are attributed to exposures inherent in firefighting, including combustion products, diesel exhaust, soot, and toxic chemicals often encountered at fire scenes. Furthermore, many of the modifiable risk factors that increase a firefighter's likelihood of developing heart disease — such as smoking, obesity, a sedentary lifestyle, and poor nutrition — are also significant risk factors for cancer.



[www.nvfc.org/lrr](http://www.nvfc.org/lrr)

The National Volunteer Fire Council and International Association of Fire Chiefs' Volunteer and Combination Officers Section released the [Lavender Ribbon Report](#) to present 11 specific actions firefighters need to take to lessen their risk of occupational cancer.

Addressing common modifiable risk factors not only protects firefighters from cardiovascular disease but also plays a crucial role in reducing their overall cancer risk. Efforts to reduce these shared risk factors through healthy lifestyle interventions, including regular physical activity, smoking cessation, balanced nutrition, and proper use of personal protective equipment, can simultaneously mitigate the risks of cardiovascular disease and cancer, helping firefighters lead healthier, longer lives.

**The International Agency for Research on Cancer (IARC) classifies firefighting as a Group 1 carcinogen.**

### REDUCE EXPOSURE:

- ✓ Use PPE properly and consistently
- ✓ Decontaminate gear after each fire
- ✓ Stay fit & eat healthy to lower cancer risk

**Protect yourself today for a healthier tomorrow!**

## CHRONIC RESPIRATORY ILLNESSES

Chronic respiratory illnesses such as chronic bronchitis, asthma, and chronic obstructive pulmonary disease (COPD) are common among firefighters, largely due to regular exposure to smoke and toxic substances. However, these are also impacted by excess weight and obesity, lack of sufficient physical activity, poor diet, and sleep disruption.

## DIABETES AND HYPERTENSION

While chronic exposure to stress, smoke, and toxins can raise blood sugar and blood pressure, modifiable lifestyle factors play a significant role in these conditions. Disrupted sleep patterns increase the risk of diabetes and hypertension, while poor nutrition and unhealthy eating habits contribute to obesity and metabolic disorders. Additionally, insufficient physical activity and lack of structured fitness programs can lead to weight gain and other chronic health issues.

## MENTAL HEALTH CONDITIONS

Firefighters commonly experience anxiety, depression, post-traumatic stress, and other mental health challenges due to chronic stress, trauma exposure, and disrupted sleep patterns. However, modifiable risk factors also play a significant role. Obesity and poor nutrition are associated with a higher risk of depression and anxiety, while nutrient-deficient diets can negatively impact brain health and emotional resilience.

Additionally, chronic sleep disruptions further exacerbate mental health issues and increase stress vulnerability.

## MUSCULOSKELETAL DISORDERS

The physically demanding nature of firefighting, including repetitive motions and carrying heavy equipment, often leads to injuries, arthritis, chronic back pain, and joint issues. Excess weight and a lack of regular physical activity further increase the risk of these musculoskeletal conditions.



# SLEEP DISORDERS

Firefighters frequently experience sleep disorders such as sleep apnea and chronic insomnia due to irregular shift schedules and disrupted circadian rhythms. Obesity, smoke exposure, and toxins further increase the risk of breathing-related sleep conditions. Additionally, stress, PTSD, and anxiety from high-risk situations can make it difficult to fall and stay asleep. Chronic sleep deprivation impairs reaction time, decision-making, and overall job safety.

# STRESS

Managing stress is essential for firefighter health and safety. Chronic stress can increase your risk of heart disease, high blood pressure, poor sleep, and mental health challenges like anxiety and depression. Firefighting is a high-stress job, so finding healthy ways to cope — like exercise, deep breathing, talking with others, or using peer support resources — can make a big difference. Taking care of your mental health helps you stay focused, resilient, and ready to respond when your community needs you.

Remember, **stress can increase cardiovascular risk**. Engaging in stress management techniques such as mindfulness or yoga and utilizing mental health support resources can help reduce stress and support both your mental and physical health.

## Common Sources of Stress for Firefighters

Traumatic or emotionally difficult calls.

Irregular sleep, long shifts, and fatigue.

High call volume and fast-paced operations.

Balancing work demands with home and family life.

Organizational or crew conflict.

Grief or concern after firefighter injuries or LODDs.

Staffing shortages or resource limitations.

By recognizing and addressing the interconnected health risks outlined in this guide — including heart disease, cancer, sleep issues, and more — you can take meaningful steps today that will protect your health, your career, and your life for years to come.

**Stay heart smart, stay fit, and stay safe.**

# ADDITIONAL RESOURCES

Below are a few helpful resources to support you on your heart-health journey. This list is not exhaustive, so we encourage you to continue exploring additional tools and information to enhance your overall health and wellness.

- **Fire Rescue Wellness:** [www.firerescuewellness.org](http://www.firerescuewellness.org)
- **Firefighter Functional Fitness:** [www.firefighterfunctionalfitness.com](http://www.firefighterfunctionalfitness.com)
- **NVFC Heart-Healthy Firefighter Program:** [www.healthy-firefighter.org](http://www.healthy-firefighter.org)
- **NVFC Share the Load:** [www.nvfc.org/help](http://www.nvfc.org/help)
- **PREVENT™ Cardiovascular Risk Calculator** [www.professional.heart.org/en/guidelines-and-statements/prevent-calculator](http://www.professional.heart.org/en/guidelines-and-statements/prevent-calculator)
- **Quit Smoking:** [www.science-alliance.org/privacy-policy-for-quitspit-mobile-app](http://www.science-alliance.org/privacy-policy-for-quitspit-mobile-app) and [www.nvfc.org/tobacco](http://www.nvfc.org/tobacco)
- **Science to the Station Re-Search Tool:** [www.science2station.org/re-search](http://www.science2station.org/re-search)



# FIREFIGHTER CARDIOVASCULAR HEALTH RESEARCH

Recent research emphasizes that volunteer firefighters face **increased cardiovascular disease risk** due to factors such as **obesity, elevated blood pressure, high cholesterol, and occupational exposures** like smoke inhalation, stress, and shift work. Studies highlight the importance of structured exercise programs, improved fitness resource access, and targeted health interventions — like those recommended by the BETTER HEART report — to effectively reduce these risks and improve overall firefighter health outcomes.

Interested in what the research says about firefighter heart health? Check out the summaries below. Click the links to learn even more.

## [Firefighter Fatalities in the United States](#)

Each year, the U.S. Fire Administration (USFA) tracks and collects information on the causes of on-duty firefighter fatalities that occur in the United States. The resulting fatality reports detail firefighter fatality statistics. For decades, heart disease has consistently been the leading cause of on-duty death for firefighters, accounting for a significant portion of firefighter fatalities each year. Stress and overexertion — often resulting in heart attacks — are the most common contributing factors, particularly during fireground operations and emergency incidents. Volunteer firefighters regularly represent a substantial proportion of line-of-duty deaths, reflecting both their numbers and the risks they face. These ongoing trends highlight the critical importance of improved training, health awareness, and safety practices to help reduce preventable deaths in the fire service.

## [Gendron et al., 2018. Cardiovascular Disease Risk in Female Firefighters](#)

This research focuses on the cardiovascular disease risk profile among female firefighters. It finds that female firefighters are at considerable risk of developing CVD due to a combination of occupational stressors, lifestyle factors (such as diet and exercise habits), and less access to gender-specific health resources. The study emphasizes the importance of creating more inclusive health programs tailored to female firefighters' specific needs.

## [Jahnke et al., 2022. Prevalence and Predictors of Obesity Among Women in the Fire Service](#)

This study investigates obesity prevalence among female firefighters and identifies its predictors. Findings reveal that nearly half of the female firefighters are classified as overweight or obese, with predictors including age, lack of physical activity, and poor nutrition. The study calls for gender-specific health initiatives, including tailored fitness and nutrition programs, to address obesity and related CVD risks in women firefighters.

### [Martin et al., 2019. Cardiovascular Disease Risk Factors and Physical Fitness in Volunteer Firefighters](#)

This study assesses CVD risk factors and physical fitness levels among volunteer firefighters. Findings highlight that many volunteers have elevated risk factors, such as high blood pressure, high cholesterol, and obesity, often due to limited access to fitness facilities and lack of structured physical training programs. The research suggests that enhancing access to fitness resources and structured exercise programs can improve cardiovascular health in this group.

### [Mathias et al., 2020. Changes in Firefighter Weight and Cardiovascular Disease Risk Factors Over Five Years](#)

This study tracks changes in body weight and CVD risk factors among firefighters over five years. The findings show a significant increase in body weight and the prevalence of obesity, which are linked to elevated blood pressure, cholesterol levels, and blood sugar, all contributing to increased cardiovascular risk. The study underscores the need for ongoing health monitoring and targeted weight management programs to reduce CVD risk among firefighters.

### [Navarro et al., 2019. Wildland Firefighter Smoke Exposure and Risk of Lung Cancer and Cardiovascular Disease Mortality](#)

This research explores the impact of smoke exposure on wildland firefighters' risk of lung cancer and CVD mortality. Results indicate a significant association between prolonged exposure to smoke and an increased risk of both lung cancer and cardiovascular mortality. The study suggests implementing protective measures, such as using PPE and reducing exposure duration to mitigate these risks.

### [Ras et al., 2023. Association Between Physical Fitness and Cardiovascular Health in Firefighters](#)

This study evaluates the link between physical fitness and cardiovascular health among firefighters. Results show a strong inverse association: higher physical fitness levels correspond with lower cardiovascular risk factors, including reduced blood pressure, cholesterol levels, and body fat percentage. The findings advocate for regular fitness assessments and targeted exercise programs to improve cardiovascular outcomes for firefighters.

Smith et al., 2023. BETTER HEART Final Report: Enhancing Firefighter Cardiovascular Health Through Targeted Interventions.

This report focuses on improving heart health among firefighters through the “BETTER HEART” program. The study emphasizes personalized interventions, including physical activity, nutrition, and stress management strategies to reduce CVD risks. The report highlights that tailored, occupation-specific health programs significantly improve cardiovascular health outcomes for firefighters, including reduced blood pressure, improved cholesterol levels, and enhanced overall fitness.

Soteriades et al., 2011. Cardiovascular Disease in U.S. Firefighters: A Systematic Review

This systematic review examines the prevalence and risk factors for CVD among U.S. firefighters. The findings indicate that firefighters are at a higher risk for CVD than the general population, largely due to occupational hazards such as exposure to toxic substances, extreme physical exertion, and shift work. The review highlights the need for more comprehensive health surveillance, preventive measures, and lifestyle interventions to mitigate these risks.



# THANK YOU

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