

# Provider's Guide to FIREFIGHTER MEDICAL EVALUATIONS

Firefighting is a uniquely stressful and dangerous job that requires working in unpredictable and often toxic environments. Due to the demands, firefighters are at increased risk for job-related **CANCER**, **MENTAL HEALTH CONCERNS**, and **CARDIOVASCULAR EVENTS**.

While the USPSTF recommendations should be used as a baseline, they are designed for the general population and not an occupational group with increased risk. Providers should be aware of the unique exposures and consider this in conjunction with personal and family risk factors when weighing timing and frequency of screenings.

## CARDIOVASCULAR DISEASE (CVD)

Sudden cardiac events account for ~50% of acute duty-related death among firefighters primarily by myocardial infarction or cardiac arrest.<sup>1</sup>

Consider thoroughly screening and aggressively treating CVD risk factors. An ASCVD risk score can help identify firefighters who may need to initiate treatment for hypertension or dyslipidemia.

Expert Panel Recommendation: Based on risk factors, evaluate firefighters for coronary heart disease (CHD) and structural heart changes, specifically consider:<sup>2</sup>

Coronary Artery Calcium (CAC) Scan at age 40 yrs., or earlier based on clinical judgment and risk profile

Screening for structural heart disease including left ventricular hypertrophy, cardiac chamber enlargement, valvular abnormalities, or diastolic/systolic dysfunction using screening echocardiography in the presence of hypertension, obesity, Metabolic Syndrome or sleep apnea

A large-scale autopsy review found approximately 80% of firefighters who suffered a sudden cardiac event had evidence of both coronary heart disease (>50% occlusion) and a structurally enlarged heart. Only about 20% of autopsies had evidence of an intracoronary thrombus, suggesting ischemic heart disease and resultant complications may be responsible for a large percentage of cardiac line of duty deaths.<sup>3</sup>

## FIREFIGHTERS AS TACTICAL ATHLETES

### Cardiovascular

Extreme physical work, >70 lb of gear, strain on cardiovascular system

### Hematological

Dehydration (decreased plasma volume), hemoconcentration

### Thermoregulatory

Elevated core temperature, dehydration, heat stress

### Respiratory

Increased breathing rate and oxygen consumption

### Metabolic

Oxygen cost (extreme physical work), increased lactate, fatigue

### Immune/Endocrine

Increased leukocytes and hormones

### Nervous

Sympathetic surge, increased adrenaline

### Muscular

Increased oxygen use and heat production

### Psychological

Repeated exposures to trauma, sleep disruption, increased mental and behavioral health concerns



## CANCER

Firefighters have been found to be diagnosed with cancer at earlier ages than the general population.<sup>4-8</sup>

While firefighters do wear PPE, their gear does not protect them from all carcinogenic exposures on the fire ground and modern fires burn hotter and dirtier than ever before.<sup>10</sup>

While studies are evolving to empirically validate screenings beyond those of the USPSTF for firefighters, experts working with this population strongly suggest considering:

Discussing pros and cons of tracking PSA annually starting at age 40

Colorectal cancer screening beginning at age 40  
Cervical cancer screening every 1-3 years based on risk factors

Annual mammograms beginning at age 40

Annual testicular exam and instruction for self-examination

Annual head-to-toe skin examination and appropriate dermatology follow-up

Urinalysis annually for microscopic hematuria

## CANCERS found to be increased among Firefighters

Brain <sup>4,6,7</sup>	Colon <sup>4,3</sup>	Bladder <sup>5,8,9</sup>
Non-Hodgkin's Lymphoma <sup>4,8,9</sup>	Cervical <sup>9</sup>	Mesothelioma <sup>4,8,9</sup>
Leukemia <sup>7</sup>	Prostate <sup>4,6,9</sup>	Rectum <sup>4,5,8</sup>
Breast <sup>10</sup>	Testicular <sup>4,6,9</sup>	Intestines <sup>5</sup>
Melanoma <sup>6,9</sup>	Stomach <sup>4</sup>	Lung <sup>5</sup>
Kidney <sup>4,7</sup>	Thyroid <sup>6,8</sup>	Esophagus <sup>5,7</sup>
Multiple Myeloma <sup>4,7</sup>		

## CARCINOGENS found in smoke

Carbon Monoxide	Hydrogen Cyanide
Hydrogen Chloride	Asbestos
Sulfur Dioxide	Formaldehyde
PCB	Benzene
Chloroform	PAH
	Styrene

## BEHAVIORAL HEALTH

Firefighters have high rates of depression, post-traumatic stress, acute stress reactions, anxiety, high rates of suicidal ideation and report frequent binge drinking.<sup>12-18</sup>

Consider screening for behavioral health issues, suicidal thoughts, and substance use/abuse such as binge drinking.

## SLEEP DISORDERS

Firefighters are at high risk for sleep disorders (e.g. sleep apnea, insomnia, shift-work disorder, and restless leg syndrome).<sup>13,19</sup>

Based on the substantially high rate of sleep disorders, experts in firefighter health recommend aggressive screening and treatment for sleep disorders.

## LUNG DISEASE

Firefighters are often exposed to products of combustion that may lead to acute respiratory issues (i.e.: hypoxemia, bronchoconstriction).<sup>20</sup> Repeated exposure may cause chronic pulmonary disease and abnormal lung function.<sup>21,22</sup>

Based on risk factors, experts in firefighter health recommend considering:

Baseline Chest X-Ray and repeat imaging as clinically indicated

Low dose CT for screening of lung cancer in high-risk individuals

Regular spirometry to include FEV1, FVC, and the absolute FEV1/FVC ratio if clinically indicated

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