



**HAMPTON ROADS**



**ULTRASOUND**

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## Benefits to ultrasound screening for firefighters

We understand that Cancers and Cardiovascular disease is a rising crisis within the firefighter community. According to research by the CDC/National Institute for Occupational Health and Safety (NIOSH), Cancer is the most dangerous threat to firefighter health and safety today. Research shows that Firefighters have a 9% higher risk of being diagnosed with cancer and a 14 percent higher risk of dying from cancer than the general U.S. population<sup>1,3</sup>. Additionally, it accounted for 66% of deaths of firefighters from 2002 to 2019, according to data from the International Association of Fire Fighters (IAFF). Furthermore, cardiovascular events occur among firefighters with underlying cardiovascular disease. In fact, according to one study, sudden cardiac events have consistently accounted for approximately 50% of duty-related deaths among firefighters over the last decade<sup>2</sup>. A retrospective study examining all available autopsies from firefighter fatalities over the past 20 years found that 80% of cardiac-related fatalities had both coronary heart disease and a structurally enlarged heart (cardiomegaly and/or left ventricular hypertrophy)<sup>4</sup>. The National Fire Protection Association reported that 44% of on duty fire fighter fatalities during a ten-year period (1995-2004) were due to sudden cardiac death. Additionally, firefighter occupational cancer is also the leading cause of deaths in firefighters in 2022. Multiple research findings also suggest that preventive measures and entry-level medical evaluations are beneficial to detecting risk of on-duty sudden cardiac death (SCD)<sup>5</sup>.

In the International Journal of Environmental Research and Public Health out of almost 5,300 firefighter participants, 69% met the criteria for hypertension<sup>3</sup>. American Heart Association research from 2021, showed that fire fighters had a high risk of atherosclerotic heart disease<sup>8</sup>. Furthermore, a 2011 study indicated that cardiovascular disease was the leading cause of on-duty death among firefighters at 45% and a major cause of morbidity<sup>9</sup>. Carotid screenings have the ability for early detection of undiagnosed abnormalities. Tumors can develop near the carotid arteries called carotid body tumors. Neck pathology may also include enlarged lymph nodes. Rare tumors may originate from the aorta walls. The aorta wall may become weakened by undiagnosed, or under treated hypertension, causing a bulging of the wall and loss of tensile strength of the aorta resulting in an aneurysm. The developed aneurysm can grow and eventually rupture creating a surgical emergency. Oftentimes there are no clear indications of the presence of an abdominal aorta aneurysm, except for vague backpain that is commonly ignored. US Preventive Services Task Force, shows evidence proving that ultrasound exams have a greater than 94% accuracy in finding aorta aneurysms<sup>10</sup>.

A thyroid ultrasound is used to evaluate the soft tissue and vasculature of the gland. Ultrasound has proven to be important in the detection of abnormal thyroid lesions. A detailed analysis of tissue density has been shown to have a greater than 95% accuracy at detecting malignancy<sup>11</sup>. According to the American Urological Association, firefighter exposure to carcinogens increases the concentrations of chemicals in the urine. This damages the bladder inner lining and increases the likelihood of developing transitional cell carcinoma. Ultrasound can evaluate the lining of the bladder and the musculature of the organ to determine if there are tumors, cysts or obstructive

stones. A study in the Journal of Family Medicine supports the advantages of non-invasive diagnostic ultrasound in finding bladder cancers. Additionally, their research indicates that ultrasound has a 93% sensitivity, 100% specificity and 100% positive predictive value in detecting bladder cancer<sup>12</sup>.

An ultrasound is often the first test performed to evaluate the possibility of testicular cancer. Ultrasound is instrumental in detecting lesions in the testicle. According to the International Brazilian Journal Urology, ultrasound remains effective in detecting masses with almost 100% sensitivity for benign lesions, and greater than 90% sensitivity and specificity for detecting malignancy<sup>13,14</sup>. Data from National Institute for Occupational Safety and Health (NIOSH) indicates that firefighters are 100 times more likely to develop testicular cancer than the general population.

Female firefighters have a 4 times higher risk for cervical cancer than the general public. Endometrial cancer is the most commonly diagnosed gynecologic cancer. According to Cancer Net, about 65,950 American women were diagnosed with the disease this year<sup>6</sup>. Endometrial cancer is also the most common form of uterine cancer, so it is frequently referred to as uterine cancer. The pelvic ultrasound consists of an evaluation of the uterus and ovaries. This pelvic exam can be performed via transabdominal or transvaginal approach. According to the American College of Gynecology, transvaginal ultrasound has been shown to have a 99% predictive value for endometrial cancer<sup>15</sup>.

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