

FEMALE REPRODUCTIVE CANCERS AND FIREFIGHTING



This factsheet was developed by the International Association of Fire Fighters and the Firefighter Cancer Support Network.

Fire fighters face an elevated risk of developing cancer due to their frequent exposure to hazardous chemicals and toxic smoke. Some of these chemicals have been linked to the development of female reproductive cancers. This factsheet provides an overview of female cancers, fire fighter exposures, and relevant National Fire Protection Association (NFPA) 1582 standards.

BREAST CANCER

Breast cancer is one of the most common cancers among females in the United States and although it is most common in females, men can get breast cancer too.ⁱ Female fire fighters are specifically at an increased risk of developing breast cancer. In a study done by Daniels and colleagues, there was a **46% increase** in breast cancer compared to the general population.ⁱⁱ This study also found that the majority of cancer deaths among female fire fighters were the result of breast cancer.



Occupational exposures that put fire fighters at an increased risk of breast cancer include benzene, polycyclic aromatic hydrocarbons (PAH), and endocrine-disrupting chemicals like dioxins, phthalates, polychlorinated biphenyls (PCBs), and polybrominated diphenyl ethers (PBDEs). There is also evidence to support an increased risk for breast cancer among women who engage in shiftwork or have jobs that require them to be awake at night.ⁱⁱⁱ

Additionally, it was found that exposure to breast cancer-relevant chemicals was reported to occur through various events and sources, including structure fires, live training scenarios, biomass burnings and wildland fires, vehicle fires, off-gassing from personal protective equipment (PPE), and fire station dust and air.^{iv}

CERVICAL CANCER

Cervical cancer starts in the lining of the cervix or the lower part of the uterus or womb. The cervix connects the body of the uterus (the upper part where a fetus grows) to the vagina (birth canal). Cervical cancer occurs when abnormal cells in the cervix grow out of control.^v

A cohort study including over 2,000 female fire fighters found that they were more than **500% more likely** to develop cervical cancer than non-firefighting females in the general population.^{vi} While data on cervical cancer among fire fighters is limited, this is likely due to the small sample sizes of women in existing studies. Exposure to phthalates, a known carcinogen for fire fighters on the fireground, has been specifically shown to increase the reproduction of cancer cells in gynecologically related cancers, especially cervical cancer.^{vii}

OVARIAN CANCER

Ovarian cancer is a type of cancer that forms in the ovaries, which are female reproductive glands that produce eggs, as well as hormones. Ovarian cancers were previously believed to begin only in the ovaries, but recent evidence suggests that many ovarian cancers may also start in the cells in the far (distal) end of the fallopian tubes.^{viii}

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IARC has identified that exposure to asbestos is associated with an increased risk of ovarian cancer.^{ix} Fire fighters have the potential for exposure to asbestos, which may be released when older buildings burn. Asbestos fibers are likely to be dislodged during building destruction caused by fire, as well as during active building demolition by fire fighters during overhaul.

RELEVANT NFPA 1582 STANDARDS

It is important for all fire fighters to receive an NFPA 1582 annual medical exam, which includes necessary cancer screenings. For female fire fighters, the standard identifies:

- Female fire fighters shall be screened for cervical cancer with cytology (i.e., pap smear) every three years from ages 21 to 65 or, for fire fighters who want to lengthen the screening interval, with high-risk human papillomavirus (HPV) testing with or without cytology every five years.
- Mammography shall be performed on each female member bi-annually for those over the age of 40 and annually for those over the age of 50 or as clinically indicated.

It is important to remember that female fire fighters make up 3–5% of career fire fighters nationally, which means many large-scale studies on cancer in fire fighters often exclude female-related cancers due to their relatively low numbers.^x More studies need to be done to provide a better understanding of the impact and cancer outcomes for females, and, fortunately, some are currently underway.

SOURCES

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