

FIREFIGHTERS: Three reasons why using your SCBA makes sense

1

Smoke contains hundreds of toxic substances, many of which are linked to cancer.



Forest firefighters are exposed to a complex mixture of substances as organic material breaks down during a fire, including acetaldehyde, acrolein, benzene, black carbon, 1,3-butadiene, formaldehyde, fine particulates, hydroquinone, methanol, methyl chloride, methylphenols, polycyclic aromatic hydrocarbons, polychlorinated dibenzo-*p*-dioxins, radionuclides including iodine-129, cesium-137, and chlorine-36, styrene, toluene and more...^{1,2,3}



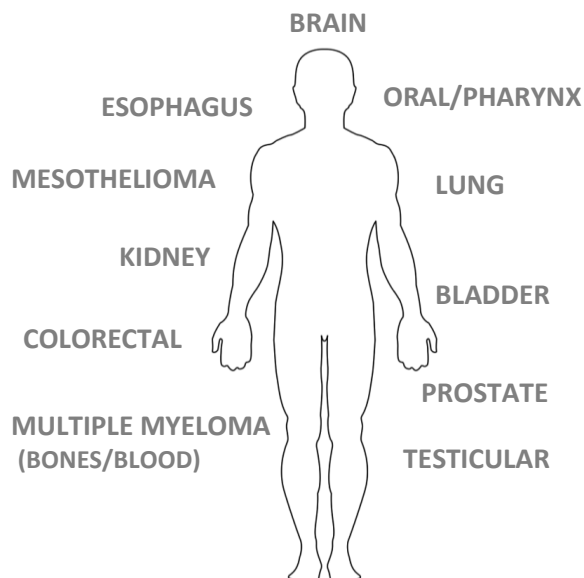
Municipal firefighters may be exposed to many of the same substances, including: acetaldehyde, asbestos, arsenic, benzene, benzofuran, 1,3-butadiene, polychlorinated dibenzodioxins, dichloromethane, ethylbenzene, formaldehyde, furan, lead, naphthalene, fine particulates, pentachlorophenol, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, tetrachloroethylene, trichloroethylene, trichloromethane, trichlorophenol and more...⁴



Emissions from vehicle fires are similar and can contain: 1,2,4-Trimethylbenzene, 1,3-butadiene, acetone, acetonitrile, acrolein, acrylonitrile, benzene, chloromethane, dichlorodifluoromethane, ethylbenzene, fine particulates, naphthalene, polycyclic aromatic hydrocarbons, polychlorinated dibenzo-*p*-dioxins and dibenzofurans, propene, styrene, toluene, *m,p,o*-xylenes and more...^{5,6}

2

Firefighters have higher rates of some cancers.^{7,8,9}



3

Your exposure to pollutants is 10,000 times lower when using a SCBA



Many harmful pollutants are invisible and levels can be high during knockdown AND overhaul, even when outdoors.¹⁰ Reducing your exposure to these pollutants reduces your risk of getting cancer. When in doubt, **use your SCBA.**

Acknowledgments:

Prepared by: Eleanor Setton, Joanne Telfer and Alison Palmer

This briefing note was developed as part of the Cancer and the Environment Projects, led by the Spatial Sciences Research Lab based at the University of Victoria, in collaboration with CAREX Canada, the Propel Centre for Population Health Impact, the First Nations Environmental Health Innovation Network and Tribal Chiefs Ventures Inc. Support for the Cancer and the Environment Projects comes from the Canadian Institutes for Health Research and the Canadian Partnership Against Cancer.

References and Source Material

- ¹ Stefanidou, M., Sotiris Athanaselis, and Chara Spiliopoulou. "Health impacts of fire smoke inhalation." *Inhalation toxicology* 20.8 (2008): 761-766.
- ² Naeher, Luke P., et al. "Woodsmoke health effects: a review." *Inhalation toxicology* 19.1 (2007): 67-106.
- ³ Larson, Timothy V., and Jane Q. Koenig. "Wood smoke: emissions and noncancer respiratory effects." *Annual review of public health* 15.1 (1994): 133-156.
- ⁴ [IARC Monograph Volume 98: Painting, Firefighting, and Shiftwork](#)
International Agency for Research on Cancer, 2010.
- ⁵ Fent, Kenneth W., and Douglas E. Evans. "Assessing the risk to firefighters from chemical vapors and gases during vehicle fire suppression." *Journal of environmental monitoring* 13.3 (2011): 536-543.
- ⁶ Wichmann, H., W. Lorenz, and M. Bahadir. "Release of PCDD/F and PAH during vehicle fires in traffic tunnels." *Chemosphere* 31.2 (1995): 2755-2766.
- ⁷ Bates, Michael N. "Registry-based case-control study of cancer in California firefighters." *American journal of industrial medicine* 50.5 (2007): 339-344.
- ⁸ Daniels, Robert D., et al. "Mortality and cancer incidence in a pooled cohort of US firefighters from San Francisco, Chicago and Philadelphia (1950–2009)." *Occupational and environmental medicine* 71.6 (2014): 388-397.
- ⁹ Pukkala, Eero, et al. "Cancer incidence among firefighters: 45 years of follow-up in five Nordic countries." *Occupational and environmental medicine* (2014): oemed-2013.
- ¹⁰ [IARC Monograph Volume 98: Painting, Firefighting, and Shiftwork](#)
International Agency for Research on Cancer, 2010.