Cancer Prevention: Personal Protective Equipment (PPE) Decontamination

Firefighters face numerous hazards while performing in the line of duty; and, the risks of severe and potentially fatal injuries from the dangerous conditions at a fire scene are well documented. In addition to the obvious physical hazards, fires generate toxic contaminants, some that are known or suspected to cause cancer.

In 2010, the National Institute for Occupational Safety and Health (NIOSH) initiated a multi-year study of approximately 30,000 fire fighters from Chicago, Philadelphia, and San Francisco Fire Departments. The study, completed in late 2015, sought to better understand the potential link between firefighting and cancer.

Notable findings from the research include: [1, 2]

- Firefighters had more cancer deaths and cancer cases than expected.
- The increase in cancer was primarily due to digestive, oral, respiratory, and urinary cancers.
- There were about twice as many malignant mesothelioma cases than expected. Asbestos exposure is likely in firefighting and is the primary cause of this disease.
- The findings suggest fire fighters are at higher risk of cancers of the digestive, oral, respiratory, and urinary systems when compared to the general population.

Protecting members with PPE is a crucial form of loss reduction in the fire service, and a thorough PPE maintenance program is just as important in protecting members. **NFPA 1851 Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting (2014)** addresses the care and maintenance of turnout gear including decontamination. The standard requires the wearer to evaluate their PPE after each use for immediate application of the appropriate cleaning level, further distinguishing between routine cleaning and advanced cleaning.

Routine Cleaning:
The light cleaning of ensembles or elements performed by the end user without taking the elements out of service.

Advanced Cleaning:
The thorough cleaning of ensembles or elements by washing with cleaning agents.

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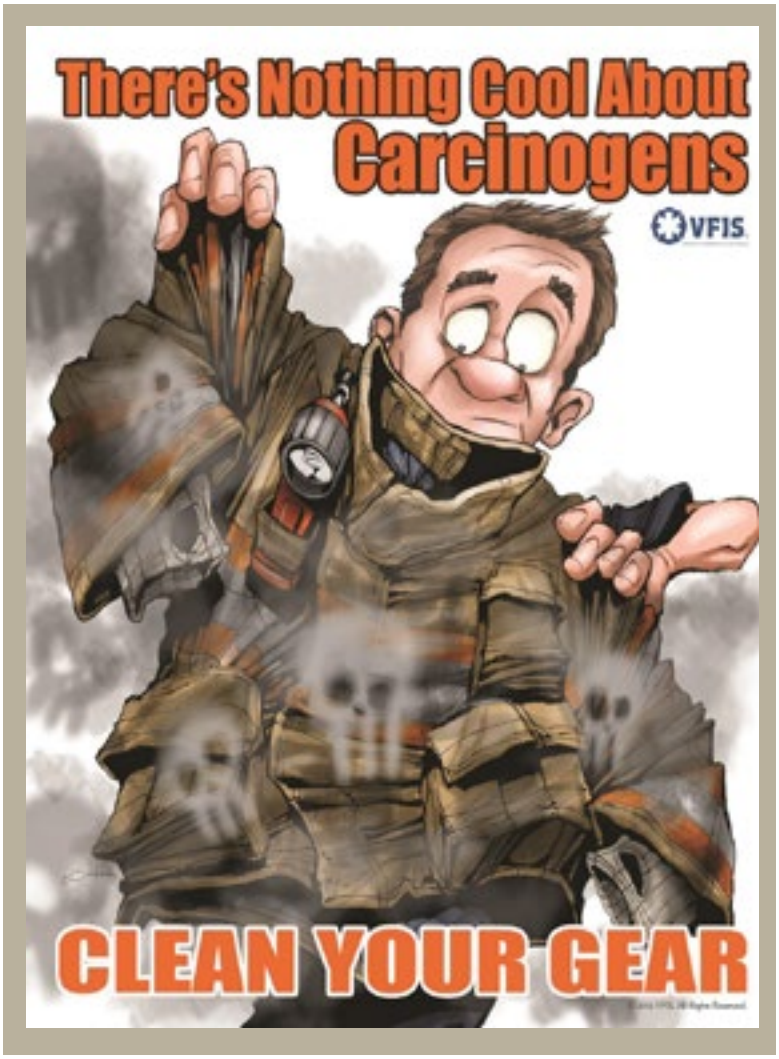
Additionally, NFPA 1581 Standard on Fire Department Infection Control Program (2015) provides minimum requirements to identify and limit the potential of an infectious exposure to fire department members. [4] In consideration of NFPA standards 1851 and 1581, it is recommended that individuals systematically evaluate and clean their gear. Areas to consider in developing decontamination best practices include the following:

Scene Decontamination Steps:

- Perform gross field decontamination at the scene to remove as much soot and particulates as possible.
- Use cleansing wipes to remove as much soot as possible from the head, neck, jaw, throat, underarms, and hands immediately.
- Use cleansing wipes to remove visible debris from helmets, facemasks, and other equipment.
- Remove gear and store it in a separate container away from the cab or passenger compartment until can be decontaminated.

Station Decontamination Steps:

- Change your clothes and wash them immediately after a fire.
- Inspect and clean turnout gear according to the manufacturer's recommendations.
- Scrub soiled gear or run it through a commercial washer, where available.
- Wear protective gloves and eye/face protection during equipment inspections.
- Clean the hood, face piece, gloves, helmet, flaps, and suspension system according to the manufacturer's recommendations.
- Do not take contaminated clothes or PPE home or store the materials in your vehicle.
- Decontaminate fire apparatus interiors after fires.
- Keep bunker gear out of living and sleeping quarters.
- Shower thoroughly after a fire.



A thorough and properly implemented decontamination program will help prevent exposure to higher levels of contaminants and related carcinogens. Implementing and enforcing the performance of follow-up decontamination activities will also help protect members from exposure.

[1] See https://www.cdc.gov/niosh/pgms/worknotify/pdfs/ff-cancer-factsheet-final.pdf for more detailed findings from the NIOSH study of cancer among U.S. fire fighters.
[2] See https://www.cdc.gov/niosh/firefighters/pdfs/FAQ-NIOSHFFCancerStudy.pdf for frequently asked questions regarding the NIOSH fire fighter cancer study.
[3] See NFPA 1851 (2014), specifically chapter 7, which addresses routine and advanced cleaning and decontamination requirements.
[4] See NFPA 1581 (2015), especially chapter 3, for more detailed requirements on cleaning, disinfecting, and disposal.

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