Occupational Cancer Awareness and Prevention in the Fire Service

Introduction

Firefighters respond to all types of emergencies and face hazards that expose them to many carcinogens (cancer-causing chemicals or agents), such as polycyclic aromatic hydrocarbons, asbestos, flame retardants, ultraviolet radiation, and diesel exhaust fumes. As a result, the International Agency for Research on Cancer (IARC) has concluded that occupational exposures associated with firefighting are carcinogenic in humans, meaning that there is enough evidence to conclude that their exposures cause cancer.

The purpose of this tip sheet is to raise awareness for employers, workers, health professionals, and the public about cancer risks for firefighters and to provide information on routes of exposure, early cancer detection and prevention, workers' compensation coverage and presumptive clauses, a healthy lifestyle, and mental health support.

Cancer Risks for Firefighters

The International Agency for Research on Cancer has concluded that occupational exposures associated with firefighting cause:

- Mesothelioma (cancer that forms in the tissue that lines your lungs or abdomen)
- Bladder cancer

The International Agency for Research on Cancer also concluded there is limited evidence for firefighters for:

- Blood cancer (non-Hodgkin lymphoma)
- Colon cancer
- Prostate cancer
- Skin cancer (melanoma)
- Testicular cancer

Sources of Exposure to Carcinogens

Firefighters are regularly exposed to carcinogens during their work. Actual exposures vary depending on what is burning, the fire's duration, activities being performed, and ventilation conditions, among other factors. Firefighters may be exposed to many carcinogens, including:

- Benzene
- Building materials, such as asbestos
- Chemical flame retardants
- Combustion products, such as polycyclic aromatic hydrocarbons (PAHs)
- Crystalline silica
- Diesel engine exhaust
- Infectious agents, such as hepatitis B virus and hepatitis C virus
- Heavy metals, such as cadmium and lead
- Per- and polyfluoroalkyl substances (PFAS) in foams and bunker gear
- Ultraviolet radiation from working outdoors

Additionally, firefighters often work rotating or overnight shifts. Shift work is considered hours worked outside of traditional daytime hours (Monday to Friday from 8 am to 4 pm). The International Agency for Research on Cancer has classified night shift work as a probable carcinogen. To help reduce fatigue and other related health risks, employers should implement a fatigue management plan for firefighters. This plan can include limiting the number of consecutive night shifts worked in a row, and having a mandatory rest period between shifts, allowing for adequate rest and recovery.

Routes of Exposure

Firefighters are exposed to chemicals in three ways: inhalation (breathing), ingestion (swallowing), and dermal (skin) absorption.

Inhalation is the most direct route of exposure, as workers can breathe in carcinogens that are released into the air. Inhalation can happen from:

- Lack of availability of respiratory protection while responding to a fire emergency.
- Off-gassing (release of harmful chemicals back into the air) of contaminated gear following an incident response (for example, transporting unbagged contaminated gear in a vehicle).
- Diesel exhaust exposure (for example, during vehicle start-up or improper exhaust capture systems).
- Handling contaminated gear without respiratory protection.
- Training exercises using live fire or smoke.
- Disturbing building materials during activities, such as fire suppression, overhaul, rescue, and recovery.

Ingestion happens when workers swallow carcinogens. Ingestion can happen accidentally, such as when:

- Eating food or drinking with unwashed hands or in a contaminated environment.
- Touching your eyes, nose or mouth with contaminated hands, or biting your nails.
- Removing contaminated personal protective equipment improperly, which may transfer contaminants to your mouth.

Dermal (skin) absorption occurs when carcinogens pass through the skin. Unprotected skin can become exposed when:

- Prolonged use of contaminated bunker gear or fireline workwear, such as during wildland firefighting or extended incident responses.
- Handling contaminated gear without the use of personal protective equipment, such as gloves and long sleeves.
- Lack of showers or wet wipes available for personal hygiene following an incident response.

Healthy Lifestyle

A healthy lifestyle plays an important role in reducing a firefighter's overall risk of disease, including occupational cancer. In addition to identifying and implementing control measures in the workplace, employers and workers can take steps to address risk factors they have control over, such as a lack of physical activity, poor nutrition, unhealthy sleep habits, and substance use.

To support a healthy lifestyle among workers, employers can:

- Establish a program for managing and reducing stress.
- Create a healthy eating program.
- Establish an Employee Assistance Program (EAP) for all workers.
- Provide workers with options for nutritious food.
- Give workers opportunities to be active at work, such as providing an exercise facility and equipment in the fire hall.
- Provide workers with sunscreen with a sun protection factor (SPF) of at least 30 when the ultraviolet (UV) index is 3 or higher.
- Educate workers on healthy living and taking steps to reduce risk factors.
- Include mental health days in the organization's sick leave policy.

Examples of how workers can improve their health outcomes include:

- Participate in stress-management initiatives. Use resources, such as employee assistance programs (EAPs) and peer support programs.
- Eat nutritious foods. Follow a nutrition guide tailored for firefighters or consult a dietitian regarding your individual needs.
- Engage in an active lifestyle, which includes being active for 30 to 45 minutes a day and incorporating a mix of cardiovascular, strength, flexibility, and mobility training to maintain physical fitness.
- Limit a sedentary lifestyle involving little exercise or physical activity during your off time.
- Practise proper sleep hygiene, including maintaining a consistent sleep schedule and getting seven to nine hours of uninterrupted sleep per night in a dark, cool room.
- Avoid excessive use of alcohol. Follow the recommendations from the Canadian Centre for Substance Use (CCSA) for consumption.
- Do not use tobacco products, smoke or vape.
- Use sunscreen with a sun protection factor (SPF) of at least 30 regularly when the ultraviolet (UV) index is 3 or higher.

Recording Hazardous Exposures

Firefighters should record details of their exposures following every incident response where there is an exposure or potential exposure to a carcinogen. If a firefighter develops occupational cancer, a record of exposure can support medical claims and can also be used to update the organization's procedures. That is why it is important for firefighters to document every exposure throughout their career. Exposures can be recorded in writing or electronically.

Hazardous exposure recording should be tailored to the organization, type of firefighting, and activities performed. Details can include:

- Date, time, and location
- Incident type, for example, residential fire, transport incident, or training exercise
- Activity performed, for example, extinguishment, inspection, or overhaul
- Materials exposed to and the route of exposure
- Control measures in place, such as personal protective equipment and gross decontamination
- Smoke conditions
- Type of equipment operated
- Any symptoms experienced

Medical Screening and Diagnostic Testing

Firefighters are at an increased risk of developing certain occupational cancers due to their exposure to carcinogens, making proactive health monitoring essential for early detection and prevention. Medical screening and diagnostic testing should be completed based on the unique exposures of firefighters and are critical to detect health issues before they become serious.

There are currently no widely accepted guidelines for health care providers on firefighter-specific cancer screenings or diagnostic testing in Canada. However, there are steps employers can take to support workers in early cancer detection and prevention, including:

- Establishing medical surveillance programs, including cancer screening for early detection. The National Fire Protection Association (NFPA) 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments* can be used as a guideline.
- Educate workers on their exposures and increased risks of occupational cancers, and how to reduce their exposures.
- Provide workers with resources for their health care providers, such as a letter explaining their increased risk and exposure history.

Workers can improve their health outcomes by participating in medical screening and diagnostic testing with their health care providers. Workers should:

- Attend annual physical appointments.
- Participate in baseline testing.
- Perform self-screening, where applicable, such as for testicular or skin cancer.
- Provide health care providers with resources on occupational cancers in firefighters, such as types of cancers, exposures, and faster screening timelines.
- Develop strong relationships with health care providers to communicate their needs effectively.

Workers' compensation and presumptive clauses

Workers' compensation boards are responsible for providing compensation to workers who are injured or become ill due to their work. Compensation policies differ across jurisdictions. Every jurisdiction in Canada recognizes that cancers linked to firefighting activities are occupational diseases. However, the definition of a firefighter varies among jurisdictions, as does presumptive coverage of cancers. A presumptive clause refers to the decision by a workers' compensation board, where, if a firefighter is diagnosed with occupational cancer and certain conditions are met, it is automatically assumed that the cancer diagnosis is directly caused by their occupation. Many jurisdictions have a presumptive clause for cancer diagnosis in firefighters. For detailed information regarding presumptive clauses specific to your jurisdiction, please refer to your workers' compensation board.

Employers should educate workers on the workers' compensation system that applies to them. Workers diagnosed with occupational cancers who are covered by a presumptive clause may be entitled to benefits, including support for medical expenses and lost wages.

Mental Health Support

Firefighters are exposed to events that can negatively impact their mental health and lead to anxiety, depression, post-traumatic stress disorder (PTSD), and burnout. Early intervention for post-traumatic stress injuries (PTSI) can help prevent the development of PTSD. Mental health resources and support should be provided to all workers, including access to an employee assistance program, if available, and training on how to identify and manage stress.

Refer to the following mental health information resources:

- Mental health – Canadian Centre for Occupational Health and Safety
- Mental health support: Get help – Public Health Agency of Canada
- Mental health and wellness – Public Health Agency of Canada

This resource was developed in partnership with Health Canada to help raise awareness about the risk of occupational cancer for firefighters, in support of actions identified in the National Framework on Cancers Linked to Firefighting. This guidance reflects current understanding and may change as new information on firefighter health and safety is made available.