

NL

Firefighters

Statutory Review 2020

Presumptive Cancer Coverage
Heart Injury Coverage

International Association of Fire Fighters

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Issue For Review

We submit that there is sufficient evidence to amend the Workers Compensation Act to include presumption for prostate, melanoma, cervical and ovarian cancers for fire fighters and fire inspectors, who have a work history that satisfies the required latency period.

We also submit that there is sufficient evidence to amend the Workers Compensation Act to include presumption for fires fighters who experience a cardiac event while responding to an emergency incident, while engaged at an emergency incident and for a cardiac event that occurs within 24 hours of being engaged at an emergency incident.

We respectfully request that you make these recommendations to the provincial government.

Introduction

It is commonly accepted, and statistically proven, that firefighting is one of the most dangerous occupations worldwide. As fire fighters we face a full range of hazards in our efforts to fight fires and rescue people trapped within burning structures. We encounter additional hazards whenever we respond to chemical spills (and fires) vehicle accidents (and fires) ship, industrial, and residential fires. Generally, Fire Departments have become the default response agency for most life-altering emergencies where people find themselves or their property threatened.

It is accepted within the fire service that throughout our careers we will be routinely exposed to smoke and gases emitted from multiple sources of combustibles. Even with the best protective equipment, and standard operating procedures, there is a great potential for exposure.

Fire fighters are exposed to chemicals in the workplace and at fire and other emergency incidents by a variety of means. The substances identified as the most harmful to firefighters include particulates, gases, and fumes of an organic and/or inorganic nature

found in soot and smoke. We are exposed to heavy metals, carcinogenic chemicals, volatile gases, minerals (like asbestos) and building debris that can contain pulverized cement, glass, fiberglass and silica.

Unlike other occupations, with controls to reduce exposure, the nature and unpredictability of fires makes it impossible to systematically control most exposures in fire fighters. Fire fighters rely on personal protective equipment (PPE), which minimizes but doesn't eliminate the hazards. See attached; ***Fire Fighter Exposure to Carcinogens and Underwriters Laboratories Inc; FIREFIGHTER EXPOSURE TO SMOKE PARTICULATES.***

Lowry WT, Juarez L, Petty CS and Roberts B. Studies of toxic gas production during actual structural fires in the Dallas area. Journal of Forensic Science 1985; 30: 59-72. (attached)

Lowry and colleagues studied fire fighters' exposures at nearly 100 structural fires. They detected the presence of more than 70 different chemicals in smoke from monitored fire scenes regardless of whether synthetic materials were a major part of the materials burned.

Treitman RD, Burgess WA, Gold A (1980): Air contaminants encountered by fire fighters. Am Ind Hygiene Assoc J 41:796-802. (attached)

A Harvard study that examined levels of a number of air contaminants at more than 200 structural fires provided an excellent example of the uncontrolled, hazardous nature of fire fighter exposures. In that study, the carcinogen, benzene was detected in 181 of 197 (92%) of samples taken at fire scenes with air sampling units placed on the chests of fire fighters. Approximately 5% of the samples were above 10 ppm benzene which is 10 times the current OSHA limit. Almost 15% of the samples were found to be at or above the Short-Term Exposure Limit (STEL) of 5 ppm benzene.

In contrast to almost every other workplace in the province where occupational controls in the last 40 years have reduced exposures, firefighters continue to be exposed to high levels of carcinogens in smoke because fire suppression and overhaul activities occur in uncontrolled, hazardous environments.

Fire Fighters take the risk of being exposed to carcinogens very seriously. We make every effort to assure the fire fighters are protected on the job by developing response protocols that are geared towards safety and providing the latest in Personal Protective

Equipment. Unfortunately, despite our best efforts there is a certain amount of risk that can't be prevented.

When our fire fighters get sick, because of the work they do protecting the public they need presumptive laws to assure that they receive the benefits they need and deserve.

Presumptive cancer designation under the workers compensation act means that when a fire fighter becomes ill with a recognized cancer, they don't have to prove that it is work related in order to get benefits. It is only necessary to show that they worked as a fire fighter for the required time period (latency period) to qualify. Claims for compensation can be approved much faster and fire fighters can get the benefits they need and deserve. Fire fighters who are ill can avail of the many services and programs through worker compensation that may not be available through other employment and individual insurance programs. Affected fire fighters can also avail of the many rehabilitation and return to work programs associated with workers compensation services.

Workers Compensation coverage would relieve an affected fire fighter of the stress and anxiety related to wage loss and medical benefits and the rigors of proving that their cancer is work related. Fire fighters can attend to their illness and not have to worry about how they will care for their families. They can concentrate on getting well and returning to productive life.

In 2016 the Newfoundland Labrador provincial government and Workplace NL recognized the workplace conditions that fire fighters are subjected to and amended the Workers Compensation Act to include presumption for specific firefighter cancers. Cancers of the brain, bladder, colorectal, esophageal, leukemia, lung, kidney, non-Hodgkin's lymphoma, testicular, ureter, and breast were considered occupational diseases for fire fighters and covered under the act by rebuttable presumption. Persons who worked a specific period of time as a fire fighter or a fire investigator, and had contracted one of these cancers, were entitled to benefits under the Workers Compensation Act.

We are very appreciative of the provincial governments past amendments to the Act and their efforts to protect fire fighters and to provide compensation for these specific cancers.

The science that determines the causal relationship between the occupation of firefighting and specific cancers is evolving. New studies and analysis of studies are identifying more and more cancers as being causally related to the occupation of firefighting. Because of this additional science other provincial, and territorial jurisdiction in the country are enacting presumptive legislation for their fire fighters and fire inspectors or, they are adding cancers to their existing legislation.

Supporting Evidence for Cancer Additions

Firefighting is one of the most studied professions with respect to occupational disease and cancer incidences amongst fire fighters. These studies show a strong link between the development of certain cancers and the occupation of firefighting. It is important to note that these studies may not reflect the true risk for fire fighter work related cancers. This may be the result of the number of fire fighters studied, the length of time the study includes, the healthy worker effect and the inability to monitor individual exposures. See *Melanoma in Fire Fighters Science Document (attached)*

Understanding the Data

What do these numbers mean?

Relative Risk (RR) is the risk of the group in question (here, fire fighters) getting a disease when compared to another group. The comparison group may be, for example, “the general population” or “white men in Vermont” or “all workers except fire fighters.” Indeed, there are many options for what the comparison group could be. There are benefits and drawbacks to each.

A Relative Risk of 1.0 means no difference in risk. The risk for fire fighters and for the control group is perfectly balanced. Imagine: a fire fighter’s chance of getting a disease is 3%, and the general population’s chance is also 3%. Compare 3% to 3%... 3/3... 1.

A Relative Risk of > 1.0 means there is an increase in risk. Imagine a fire fighter’s chance of getting cancer is 4.2% and the general population’s chance is 3%. Compare 4.2% to 3% = $4.2/3 = 1.4$. (Often studies will calculate **Odds Ratios** instead of Relative Risks. For the purposes described here, the importance of each is the same.)

- 1. LeMasters: Cancer Risk Among Firefighters: A Review and Meta-analysis of 32 Studies (Attached)**

The LeMasters meta-analysis was a widely reviewed report developed by environmental health researchers at the University of Cincinnati. This study, published in 2006, was a comprehensive investigation of cancer risks associated with fire fighters using a research technique known as “meta-analysis.”

Meta-analysis is a quantitative statistical analysis method that pools data from separate but similar experiments or studies. Using meta-analysis, researchers are able to test the pooled data for statistical significance which is better able to detect increased risk.

LeMasters and her colleagues combined data from 32 smaller studies of fire fighters for 20 different cancer types. They classified the cancers into three categories: probable, possible, or unlikely. The results of this analysis showed fire fighters as opposed to the general population as.

Malignant melanoma - RR 1.32 (32% greater risk)

Prostate cancer - RR 1.28 (28% greater risk)

2. The National Institute for Occupational Safety and Health (NIOSH) published a study of fire fighters and cancer rates in 2011. (attached)

The NIOSH study examined cancer risks in 29,993 career fire fighters from three large U.S. cities: San Francisco, Chicago, and Philadelphia.

This study looked not only at deaths from cancer, but also at the diagnosis of certain kinds of cancer, such as testicular and prostate cancer, which have higher survival rates. It also examined other causes of death to better understand the risk for various cancers and illnesses among firefighters compared to the general public.

The study examined more exposures than previous studies. It looked at the number and type of fire runs made (for example, EMS and vehicle fire) and the use of personal protective equipment and diesel exhaust controls. In addition, both non-white and female firefighters are represented.

The studies finding are generally consistent with the results of several previous, smaller studies. Because the new study had a larger study population, followed for a longer study period, the results strengthen the scientific evidence for a relation between firefighting and cancer.

This study also found excess bladder and prostate cancer incidence among fire fighters less than 65 years of age. The prostate cancer excess is limited to fire fighters 45 – 59 years old.

The study also found that fire fighters are diagnosed with prostate cancer at a much earlier age than the general population. The excessive range was between 45-59 years of age. The majority of the general population are affected after the age of 60.

3. The Nordic Study (Attached)

The Nordic study, the third key study, studied the likelihood of cancer risk in a cohort of 16,422 fire fighters from five Nordic countries. Cancer incidence was assessed by linking national cancer registries to census data on occupations from 1961 – 2005. The study found an increased risk for all cancers combined in fire fighters similar to the NIOSH study. It also found statistically significant increased risk for developing the following cancers:

Prostate cancer (13% increase) The highest risk was found among fire fighters 30 – 49 years old: (159% increased risk)

Malignant melanoma (25% increase)

Non-melanoma skin cancer (33% increase)

4. Australian Firefighters' Health Study (attached)

In 2011, Monash was commissioned by the Australian Fire and Emergency Service Authorities Council (AFAC) to carry out a national retrospective study of firefighters' mortality and cancer incidence known as the Australian Firefighters' Health Study. This study was prompted, in part, by the results of several overseas studies which had identified excesses of several types of cancers in firefighters. The aims of the study were to examine mortality and cancer among firefighters and investigate different

subgroups, based on type of employment, duration of firefighting service, era of first employment/service, serving before/including or only after 1985, by the number of incidents attended and whether an individual was identified as having been a trainer.

Results of the Monash study showed:

There was a statistically significant increase in prostate cancer incidence for career full-time firefighters overall, and particularly for those employed for more than 20 years. There was a significant trend with employment duration and the number of incidents attended and some significantly increased risks for higher tertiles of incidents attended.

The risk of melanoma was significantly increased for career full-time firefighters, and for both of the employment duration groups who were employed for more than 10 years. It was not related to duration of service or number or type of incidents attended in internal analyses, however. Melanoma was significantly increased for all eras of first employment (pre-1970, 1970-1994, 1995 and later). When compared to state rates (melanoma varies widely throughout the country), the risk of melanoma was significantly increased for the whole group of career full-time firefighters and for those from New South Wales, Victoria and Western Australia.

5. Mount Sinai report " Occupational Cancers in New York City Firefighters.

The authors conclude that prostate cancer is one of the cancers that *"can plausibly be linked biologically with carcinogenic chemical exposure encountered by firefighters in their work... It is unlikely that the associations observed between these exposures and these cancers can be attributed solely to the personal lifestyle factors (diet, cigarette smoking, alcohol intake) or medical treatments (radiation or chemotherapy), that have been linked with certain cancers."*

6. Risk of Cancers Amongst Fire Firefighter in California, 1988-2007

This study of California fire fighters showed an excessive rate of both prostate and cancer and melanoma in fire fighters.

The study looked at the odds of fire fighters getting melanoma in two distinct time periods. Not only did this study identify increase risk for getting melanoma in each time frame, but the risk appeared to be increasing in recent years.

1988- 1995: OR (95% C.I.) = 1.55 (1.19-2.01)

1996- 2003: OR (95% C.I.) = 1.86 (1.51-2.29)

Cervical and Ovarian cancers

Cervical and Ovarian cancers are common amongst female fire fighters. The small number of female fire fighters in the fire service makes it particularly difficult to study and determine the work- relatedness of these cancers. Scientific evidence acknowledges the work- relatedness of the male reproductive organs so we could take from that that the female reproductive organs are similarly affected by workplace conditions of a fire fighter.

Canadian Jurisdictional Analysis of Cancer Coverage (see attached)

Prostate Cancer

British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Prince Edward Island, and the North West Territories

Melanoma (Skin Cancer)

Manitoba, Ontario and Nunavut

Ovarian

Alberta, Saskatchewan, Ontario

Cervical

Ontario, Saskatchewan, Alberta

Heart Injury

British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, New Brunswick, Prince Edward Island, Yukon, North West Territories, Nunavut

Heart Injury

Firefighting is at times an extremely physical demanding job. Fire fighters are routinely subjected to sudden, extreme exertion and exposure to a toxic environment. This is often coupled with high levels of stress and extreme heat.

From the time an alarm sounds at the station firefighters, exertion and stress levels increase and the cardiac system is negatively affected. Fire Fighters can go from a state of relaxation to extreme exertion within three to four minutes of an alarm. A Fire Fighters work environment can alternate between high heat and extreme cold and stormy conditions depending on the season.

The effects on the fire fighter's cardiac system is further compromised by the hazardous increase in body temperature created by their turnout ensemble and heavy, bulky, personal protective equipment.

Analysis as shown that a firefighter's body temperature, heart rate increase to hazardous levels, very quickly after an alarm is received. This is a result of a quickened environment, heightened anticipation, and increased stress levels.

The IAFF have had a number of young, physically fit firefighters who have succumbed to heart attacks while fighting jobs. These incidents have been linked to high internal body temperature and dehydration. In order to alleviate these alarming concerns, the IAFF is working diligently to educate our fire fighters about these cardiac concerns. We are also assuring that our fire fighters follow prescribed fire ground rehabilitation procedures, medical monitoring and adequate hydration both on and off the fire ground. We also promote, healthy eating, exercise and overall wellness and fitness.

These preventive measures will hopefully reduce the number of cardiac incidents put it won't eliminate it.

Supporting Evidence for Heart Injury

A number of studies have been conducted on the work environment of fire fighters with respect to heart attacks on the job and the development of heart disease.

1. Firefighters and on-duty deaths from coronary heart disease: a case control study.

- Stefanos N Kales,
- Elpidoforos S Soteriades,
- Stavros G Christoudias &
- David C Christiani

Dr. Kale and Associates performed a case-control study, selecting 52 male firefighters whose CHD deaths were investigated by the National Institute for Occupational Safety and Health. They selected two control populations: 51 male firefighters who died of on-duty trauma; and 310 male firefighters examined in 1996/1997, whose vital status and continued professional activity were re-documented in 1998.

This study observed that:

Numerous occupational factors could precipitate CHD events in firefighters. First, firefighting includes long sedentary stretches followed by irregular heavy exertion [9]. Firefighters react immediately to alarms with significant increases in pulse rate [13, 14]. During fire suppression, they work at near maximal heart rates [13] while wearing about 50 pounds of protective equipment, sometimes for prolonged periods [15, 16]. Heat stress and fluid losses can result in decreases in cardiac output despite sustained tachycardia [17]. Second, self-contained breathing apparatus use has reduced, but not eliminated chemical exposures including carbon monoxide, particulates and other toxicants [18]. Third, firefighters experience intermittent noise exposure [19, 20], which may increase blood pressure. Fourth, firefighters often perform shift work, which may increase the risk of CHD.

The study further concluded that:

The present study provides a firmer basis for developing improved guidelines for determining which CHD events in firefighters are work-related. Our findings support previous suggestions by Guidotti [11] that events during or within a day after fighting a fire are likely to be work-precipitated. In addition, the onset of symptoms during other work events likely to result in cardiovascular arousal also suggests work-relatedness.

2. Health Risk and occupation as a Fire Fighter; Tee L. Guidotti

This report was conducted for the US Department of Veterans Affairs and was released in 2014. The report was conducted based on the weight of causality for workers compensation policies. In this report, Guidotti concluded.

Conditions demonstrating elevated risk among firefighters, weight of evidence is sufficient to make a recommendation on general causation:

Heart attacks following an alarm or knockdown by up to 24 to 72 hours, resulting in disability.

It is clear in a number of studies of fire fighters that cardiac events while working are causally linked to the performance of the job. Two leading factors apart from the excessive exertion and stress is the presence of carbon monoxide on the fire ground and the excessive heat conditions that fire fighters work in.

Carbon monoxide is a biproduct of combustion and is present, in varying degrees, at all fires. CO is a direct cardio toxin. Once combined with the blood it deprives the heart muscle of oxygen and could lead to heart arrhythmias or cardiac arrest. CO when combined with the blood can cause coronary artery spasm. Carbon Monoxide is also accumulative. Fire fighters who are exposed to low levels of CO at multiple incidences may have CO in their blood stream for an extended period of time, will beyond the incident. This can cause cardiac arrest or coronary heart disease.

Beyond exposed to excessive heat which wearing personal protective equipment and fighting fires can lead to dehydration. This fluid loss can lead to decreased cardiac output and cardiac arrest.

