BOSTON COLLEGE

TESTIMONY

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SB 141. AN ACT CONCERNING WORKERS' COMPENSATION COVERAGE FOR CURRENT AND FORMER MEMBERS OF PAID MUNICIPAL OR VOLUNTEER FIRE DEPARTMENTS.

Labor and Public Employees Committee
Connecticut State Senate

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Good morning

My name Is Philip J. Landrigan, MD. I am a physician trained and certified in Pediatrics, Preventive Medicine and Occupational Medicine. I serve as Director of the Program for Global Public Health and the Common Good at Boston College.

Thank you for having invited me to come before you today to provide testimony on SB 141, An Act Concerning Workers' Compensation Coverage for Current and Former Members of Paid Municipal or Volunteer Fire Departments.

This important legislation will make cancer a presumptive "line of duty" illness in eligible Connecticut fire fighters making these brave men and women eligible for workers' compensation and other benefits, including death benefits, if they should develop cancer.

I have provided clinical care and monitored the health of fire fighters for many years. While I was a US Public Health Service officer in the National Institute for Occupational Safety & Health, I evaluated the work environments of fire fighters. Following the attack on the World Trade Center on September 11, 2001, I oversaw a program at the Mount Sinai School of Medicine in New York City that provided clinical care to over 22,000 first responders, including thousands of fire fighters, Connecticut fire fighters among them. I have published multiple reports on these studies in the peer-reviewed scientific literature.

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Cancer is a well-established hazard of firefighting, and many published studies have documented that fire fighters have increased incidence and mortality from cancer in comparison to the general population.

Fire fighters develop cancer and die of cancer more frequently than the general public because in their work they are exposed to extremely high concentrations of a large and growing number of toxic and carcinogenic chemicals.

Some of these chemicals -- for example, soot containing polycyclic aromatic hydrocarbons -- are natural products of combustion and have always been present at fires.

However, the number and variety of chemical hazards confronting fire fighters has greatly increased in recent years, because the combustion of modern-day synthetic and plastic materials produces a wide range of toxic and carcinogenic chemical compounds that were not found in fires even three or four decades ago.

Chemical exposures commonly encountered at fires today include benzene, formaldehyde, polycyclic aromatic hydrocarbons (PAH), asbestos, perfluorinated compounds (PFOA and PFOS)

as well as the complex mix of carcinogens that arises from the heating and burning of synthetic and plastic materials. These chemicals are commonplace ingredients in the modern environment and are found in household furniture, plastic pipes, wall coverings, and electrical wiring.

Details of some of these toxic and carcinogenic exposures are as follows:

- Polyvinyl chloride (PVC), widely used in plumbing, electrical conduits and furniture, is a mixture of vinyl chloride polymer and a variety of additives. When PVC heats up and burns, the following hazardous compounds are released;
    - Vinyl chloride gas, a known human carcinogen, that is known to cause cancers of the liver, brain, lung, blood and nervous system;
    - Hydrochloric acid, causes acid burns in the upper airways and in the lung;
    - Benzene, a well-known cause of leukemia and lymphoma;
    - Phosgene, a potent lung irritant (used in World War I as poison gas)
    - Carbon monoxide; *and*
    - Dioxin, a known carcinogen

- Asbestos. Asbestos is a fibrous mineral that was widely used in many industries as insulation and fireproofing. More than 3,000 asbestos-containing products, mostly construction materials were produced prior to the mid- 1970s and placed in millions of buildings. These products are still found commonly today in older buildings. Fire can liberate asbestos from the structures that surround and encapsulate it and can result in exposure to fire fighters. Risk of asbestos exposure is especially high in the overhaul phase of firefighting, when fire fighters tear apart burned structures searching for smoldering embers and unextinguished fires. This process releases asbestos into the air and can result in inhalation exposure to fire fighters. Blowers used to ventilate the fire scene during overhaul may cause further spread of asbestos..

  Asbestos exposure is known to increase incidence and mortality from lung cancer, pharyngeal cancer, ovarian cancer, gastrointestinal cancer, and malignant mesothelioma, a highly fatal cancer of the lining of the lungs and the abdomen. Asbestos-related cancers may not appear until 20, 30, 40 or even 50 years following exposure.

- Polychlorinated biphenyls (PCBs) are a group of heavy, oily, liquid chemicals, that were banned in 1977 by the Environmental Protection Agency because of their health and environmental hazards. PCBs were used extensively to insulate electrical equipment such as transformers and capacitors. Equipment manufactured with PCBs is highly durable and still in wide use today, including electrical transformers in buildings and at utility company facilities, capacitors in television sets, ballasts in fluorescent lights, and insulation in older-model home air conditioners PCBs are linked to liver and pancreatic cancer.

- Polyurethane foams are found in mattresses, furniture cushions, and building insulation. Hydrogen cyanide gas is released during decomposition and combustion of polyurethane.

- Benzene, a solvent, is ubiquitous in plastics and is released when plastics burn. Benzene is internationally recognized as a human carcinogen associated with leukemia and lymphoma.

- Pesticides are found throughout any community in local grocery stores, hardware stores and garden supply stores. Many pesticides have been classified as carcinogenic.

- Polycyclic Aromatic Hydrocarbons (PAHs) are a significant component of the soot and tar that is formed in virtually any fire. These compounds have been shown to cause cancers of the skin, lung, and bladder.

- Formaldehyde is produced at every structural fire where wall papers or lacquered wall coverings burn. Formaldehyde is a powerful respiratory irritant and has been implicated in the causation of cancer of the lung and nasal sinuses.

- Perfluorinated compounds (PFOS and PFOA) are used to make non-stick (Teflon) pans, water-resistant (GoreTex) clothing and other home products. These chemicals are also used in fire-fighting foams used in suppressing electrical and chemical fires. Perfluorinated compounds are linked to developmental effects to fetuses exposed during pregnancy; to cellular damage in the liver, immune system and thyroid; and to testicular and kidney cancer.

The rapid proliferation of manufactured chemicals in our society has caught the scientific and the regulatory communities off guard. There are simply too many new chemicals and too few funds to research all of their potential hazards. Since the end of World War II, the production of synthetic chemicals has increased 350-fold. Most of these chemicals have never been assessed for safety or toxicity. With the addition of thousands of new chemicals each year, it becomes impossible to study the carcinogenic properties of each and every one of them.

More than 80,000 distinct chemical substances are currently in commercial use in the United States and are registered with the U.S. Environmental Protection Agency. The National Institute for Occupational Safety and Health estimates that nearly 3,000 of the chemical substances listed in their registry have potential to cause cancer. Fewer than 25% of these materials have ever been thoroughly evaluated.

Practically every emergency situation encountered by a fire fighter in Connecticut whether at a home, a hardware store, a drug store, a dry cleaning establishment, a pesticide warehouse or a chemical manufacturing plant fire has the potential for carcinogenic exposure. Connecticut tire fighters can additionally be exposed to carcinogenic chemicals when they respond to transportation chemical spills, to episodes at hazardous waste sites, or when the protective clothing they wear is exposed to high heat, tears, or burns. The long-term health consequences of these multiple cumulative exposures, cancer among them, may not become

apparent until years after the exposures have taken place and the details of the incidents have long been forgotten.

Fire fighters, like most workers in this country, have little idea about the identity of many of the materials they are potentially exposed to or the hazards of these exposures. Nevertheless, fire fighters continue to respond and to work without hesitation to save lives and reduce property damage without regard to danger. A fire emergency has no occupational safety and health standards to reduce the effects of toxic chemicals. It is an uncontrolled and uncontrollable environment that is fought by fire fighters using heavy, bulky and often times inadequate personal protective equipment and clothing.

Specific cancers that are known to be linked to fire fighting are the following:

- Leukemia is caused by benzene and 1,3-butadiene.
- Lymphoma and multiple myeloma are caused by benzene and 1,3-butadiene.
- Skin cancer is caused by soot containing PAH.
- Genitourinary tract cancer is caused by gasoline and PAH.
- Gastrointestinal cancer is caused by PCBs and dioxins.
- Angiosarcoma of the liver and brain cancer are caused by vinyl chloride.

It is highly likely that future research that examines the many thousands of widely used chemicals whose hazards are not yet known will identify additional associations between chemicals encountered in the fire environment and cancer in fire fighters. Nevertheless, the available data are sufficient to conclude that excess risk of cancer is a proven hazard of fire fighting.

In conclusion, the evidence is overwhelming that

1. Fire fighters suffer excess incidence and excess deaths from multiple cancers, *and*
2. Occupational exposures sustained by fire fighters can cause multiple cancers.

While medical science has identified a number of the specific chemical exposures that are responsible for excess cancers in fire fighters, it has also become clear that fire fighters are exposed in their daily work to multiple chemicals that have not been properly tested and whose risks are not yet defined. Every year, more of these previously untested chemicals are found through research to be capsule of causing cancer, and it may reasonably be anticipated that still more cause-and-effect associations between toxic chemicals and cancers in fire fighters will be identified in the years ahead.

In conclusion, I urge this Legislature to recognize cancer as an unavoidable occupational hazard of fire fighting in Connecticut and to pass SB 141 making cancer a presumptive "line of duty" illness in eligible Connecticut fire fighters.

Thank you.