





## New Study Shows Cancer Risk High for Firefighters

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### Study: Cancer Risk High for Firefighters Exposed to Burning Flame Retardants

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#### **PBDEs are used as flame retardants in household furniture, carpets, plastics, computers and foam insulation.**

ELLSWORTH, Maine -- New research by a Blue Hill scientist shows that during a fire, firefighters are exposed to dangerous levels of toxic, cancer-causing chemicals created when commercial flame retardants burn.

That firefighters develop cancer at an alarming rate is not news to industry professionals or scientists. But Dr. Susan Shaw, founder and director of the Marine Environmental Research Institute, said there's still a lot to learn. Shaw and a team of other scientists recently published the results of a study on firefighters in San Francisco.

"We know that firefighters have a high rate of cancer, we know that outcome," Shaw said in an interview Friday. "So we're looking for how to connect the dots. What are the chemicals that might be causing these cancers? Do the firefighters have more in their blood immediately after fighting a fire?"

The study tested the blood of 12 firefighters immediately after they responded to an alarm. The results were striking. Its authors, including Shaw, concluded that firefighters are at an even higher risk of cancer than previously thought.

Levels of polybrominated diphenyl ethers, or PBDEs, were three times higher than levels in the general U.S. population, at a rate of 135 parts per billion compared with the national average of 40 parts per billion.

PBDEs are used as flame retardants in household furniture, carpets, plastics, computers and foam insulation. A growing body of evidence suggests the chemicals are toxic to human beings and animals.

Two forms of PBDEs were phased out of production in 2004 because of health concerns. Shaw said both are listed as banned chemicals under the Stockholm Convention, a treaty aimed at eliminating persistent organic pollutants.

The study also showed that some of the firefighters harbored high levels of dioxins and furan, two compounds associated with cancer and other health risks that are produced when the flame retardants burn. The levels in firefighters were "hundreds of times higher than has ever been detected in the general population," Shaw said.

For John Martell, a Portland firefighter and president of the Professional Firefighters of Maine, it's not just research that links his profession with long-term health risks. It's experience.

"There's a group of firefighters in their 50s and early 60s here who have just retired," he said. "Out of that group, I can think of at least 14 that have come down with cancer. We've lost a couple guys to cancer in the last year and a half. When you look around, and I've asked other people who don't have the job I have,

you don't see that same rate."

"We've always worried about firefighters being killed in duty, buildings collapsing, things like that," Shaw said. "But the hidden danger now is what's in the smoke and dust that they're breathing, or ingesting, or getting on their skin. And that can't be helped during a fire."

Chemical flame retardants have been used for decades. Early versions were banned in the late '70s after they were shown to pose serious health risks, including non-Hodgkins lymphoma. Shaw said that as more evidence mounts about the danger of modern flame retardants, industry groups are already cooking up replacements that are also "troublesome."

"The proposed replacements are not very different, chemically, than the chemicals they're replacing," she said.

The American Chemistry Council, an industry trade group, last year issued a statement defending chemical flame retardants, saying they are necessary to meet safety standards and doubting studies that show a causal link to cancer.

But a 2012 investigation by the Chicago Tribune into flame retardants found that the chemical industry has manipulated scientific findings to overstate the effectiveness of flame retardants and downplay the health risks.

Shaw said a larger study of firefighters in New York is being planned. Researchers will examine the blood of about 300 firefighters in Albany, she said, in an attempt to find indicators of clinical conditions that could be pre-cancer.

The goal is to tie chemical exposure to clinical outcomes, to further prove the link between PBDEs in firefighters blood and the high occupational rate of cancer and other chronic disease.

Shaw said the ultimate goal is to convince Congress to pass laws regulating chemicals such as PBDEs through legislation such as an updated Safe Chemicals Act, which would tighten oversight and regulation of risky chemicals. Maine's U.S. Sen. Angus King is one of the Act's sponsors.

But there are also efforts on the ground to minimize firefighter exposure and take care of them if they do get sick.

Chief Richard Tupper of the Ellsworth Fire Department demonstrated a washdown procedure at the city's fire station on Thursday.

Smoke, soot and dust containing these dangerous chemicals often covers a firefighter's gear during a response and "the products of combustion that adhere to the turnout gear literally off-gas for days after the fire if it isn't washed properly," Tupper said. "You could absorb those byproducts simply by standing here at the station."

So Ellsworth firefighters often hose down their gear before they even leave the scene of the fire. They have also purchased special washing machines dedicated solely for turnout gear.

Martell, from the firefighters' union, said there have been other changes made since it became clear in the last two decades that firefighters were getting cancer at an alarming rate.

In the past, he said, crews would bring their gear home with them, often leaving their boots and pants in the bedroom for easy access in case of a late-night alarm. That practice has been largely abandoned today. The use of oxygen and specialized gas masks is also growing, with firefighters often wearing them even when they're not working directly in the hot zone.

Firefighters also secured legislative support to help those who do come down sick. A 2009 law made it easier for firefighters to get workers compensation to cover treatment for the 10 most forms of cancer most common to firefighters.

The firefighters union has also been active in pursuing tighter regulations on dangerous chemicals, Martell said. Professional Firefighters of Maine supported a bill pushed by former Maine House Speaker Hannah Pingree to ban the flame retardant known as "deca" in 2007.

That chemical was a suspected neurotoxin and was linked to other long-term health problems. Maine was

one of only two states to ban deca, but today its manufacturers are voluntarily phasing it out of production.

Shaw said that her focus is on firefighters because they are exposed to many more dangerous chemicals than the general population. Still, she said the presence of flame retardants should concern everyone.

"Americans have 10-40 times higher levels of these things than other countries," she said. "We're talking about involuntary exposure. People believe they are protected from toxins by the government. The truth is they're not. That's the bottom line."

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