

Fighting Fires. Fighting Cancer.

Michael Dubron knew he could die in a fire any day. But he didn't expect cancer to threaten his life.

A member of Los Angeles County, CA Local 1014, Dubron was diagnosed with colorectal cancer in 2003, when he was just 39 years old.

"They gave me one to three years to live," Dubron says. "I was blindsided. I was in absolute disbelief."

Dubron underwent surgery, and he's been cancer-free for more than five years.

Fighting fires poses obvious risks, but Dubron's medical battle — and the battles that hundreds of fire fighters wage each year against the disease — proves that cancer can be as deadly as any fire.

If you're fighting fires, chances are you may also fight cancer one day.

"We understand now that cancer is a big concern in the fire service," Dubron says.

A small but growing body of evidence shows that cancer poses a significant threat to fire fighters than the general public. That doesn't surprise researchers who say the toxic soup of carcinogens in fire smoke that fire fighters are exposed to likely is the primary reason that first responders fall victim to a range of cancers.

"We aren't making this up," says IAFF General President Harold Schaitberger. "The connection between fire fighting and cancer is real and there is scientific data to support our position. But we can't stop there; we must continue to learn more so we can prevent our members from contracting this horrible disease and help them if they do."

Without question, fire fighters have an increased risk of cancer because of the multiple chemicals they're exposed to on the job, notes Grace LeMasters, a professor of epidemiology at the University of Cincinnati and the lead author of the 2006 analysis that studied the medical information of about 110,000 fire fighters.

Smoke from burning computers, televisions and other plastics, and furniture and building materials in older structures all can release harmful toxins. Those materials can be laced with dangerous metals — lead, cadmium and uranium — or minerals — like asbestos. The list of carcinogens that fire fighters are exposed to is lengthy, and it includes known cancer-causing agents including polycyclic aromatic hydrocarbons.

Less Exposure

Fire fighters can't avoid fire smoke, but they can limit their exposure to carcinogens by wearing their breathing apparatus while they're on the fire ground, says Tom Hales, a senior medical epidemiologist with the Fire Fighter Program at the National Institute for Occupational Safety and Health (NIOSH), a branch of the Centers for Disease Control.

"Many fire fighters don't wear masks unless they're inside a structure," Hales says. Fire fighters who are on the fire ground or in the vicinity of a fire run the risk of inhaling fire smoke and exposing themselves to poisonous carcinogens if they don't wear their breathing apparatus.

"I think that the culture in the fire service is to turn on your air only when you need it," Hales continues. "A lot of fire fighters save it until they're inside a structure. If they're doing fire suppression outside, frequently they turn off their air and take off their masks. If you know you're going to be exposed to fire smoke, you should wear your mask."

Fire fighters should continue to wear their breathing apparatus and personal protective clothing during overhaul operations. Fire fighters are exposed to carcinogens even if they don't inhale fire smoke, according to LeMasters.

Soot, which contains polycyclic aromatic hydrocarbons, can be absorbed through the skin. Researchers believe the dangerous hydrocarbons can lead to lung, bladder and skin cancer.

"People think soot is benign but it is not, and most fire fighters coming back from a fire are covered in soot," LeMasters notes. Further, personal protective equipment doesn't provide sure-fire protection from exposure to cancer-causing agents.

But risks aren't limited to the fire ground.

The IAFF has found that many firehouses still don't properly control diesel exhaust to the outdoors, placing fire fighters at risk of inhaling benzene-laced diesel exhaust, which is a cancer-causing agent.

"Fire fighters clearly are exposed to a lot of carcinogens during their work. Some of those are on the fire ground, and some are not," Hales says.

In addition to wearing a breathing apparatus on the fire ground, fire fighters can limit exposure to carcinogens simply by taking a shower after returning from a fire and properly

This story is the third in a "Working to Death" series of articles in the International Fire Fighter that examine the health risks fire fighters face. More importantly the series looks at what can be done to prevent fire fighter deaths and illustrate how some are improving the health and safety of fire fighters.

cleaning personal protective equipment to wash away toxins, according to LeMasters.

Showering and cleaning equipment also prevent fire fighters from carrying carcinogens home and exposing their families to carcinogens.

Early Detection, A Better Chance

Cancer doesn't have to be a death sentence. Many cancers respond to treatment if they're detected early. According to Hales, early detection is very effective in fighting breast, testicular and colon cancer, melanoma and Hodgkin's lymphoma.

The IAFF has been a leader in cancer prevention efforts, research and education for decades. IAFF Assistant to the General President for Occupational Health, Safety and Medicine Rich Duffy says, "Fire fighters also need to fully implement and participate in the Wellness-Fitness Initiative (WFI) so they can get regular medical checkups. They also need to get past the reluctance and hesitation and go to the doctor regularly."

The IAFF has also developed a Cancer Registry to further characterize the increased risk to fire fighters for developing cancer.

Dubron, who started the Fire Fighters Cancer Support Network (www.firefightercancersupport.org) in 2005 to help fire fighters who are diagnosed with cancer, says, "We're not invincible. We're always answering everyone else's 911 calls. We're not used to asking for help when we get diagnosed with cancer."

When Dubron began the cancer network, the only support group endorsed by the IAFF for fire fighters with cancer, about three fire fighters a month called for information on cancer. Now Dubron sends information to about 200 fire fighters each month.

Cancer education needs to begin as soon as a fire fighter's career begins because the risks are so great. "Not only do fire fighters need to enroll in the WFI, fire departments need to be more proactive by addressing the dangers of cancer, talking about prevention and embracing testing and screening so cancer can be found as early as possible," Dubron says.

"We talk about hose lays and extrication and other important fire service issues with new recruits, but we also need to talk about cancer," he continues. "We need to talk about prevention, and we're doing better. Ten years ago we weren't talking about cancer like we are now."

With the addition of the Cancer Registry, the IAFF continues its research and data collection efforts to assist members in preventing, detecting and battling cancer. States and provinces also need to step up. Because of the IAFF's efforts, there is now widespread acknowledgement of the link between cancer and fire fighting, and the IAFF and its affiliates have been able to pass presumptive disability laws covering some forms of cancer in 26 states and seven Canadian provinces.

"Presumption is the right thing to do, and all states and provinces need to look out for the health and welfare of our members who get sick in the line of duty," Duffy says.

More research in the scientific community will also help.

More Studies, More Answers

At least 32 separate studies have been conducted examining the link between cancer and the hazards of the fire service. Even though it's widely accepted based on those studies that fire fighters are at greater risk of getting cancer because of their exposure to carcinogens, research must continue to determine which carcinogens pose the greatest threat to first responders or how to best protect fire fighters from contracting specific cancers in either male or female first responders.

Dr. Letitia Davis, with the Massachusetts Department of Health, points out in her 2008 study of cancer in Massachusetts fire fighters that a wide range of conclusions by researchers

revealed that fire fighters are twice as likely as the general population to develop testicular cancer. Fire fighters also face a 50 percent greater chance of contracting multiple myeloma, a deadly cancer that attacks bone marrow, and non-Hodgkin's lymphoma. They are 40 percent more likely to develop skin cancer and 30 percent more likely to develop malignant melanoma, prostate, brain and rectal cancer.

A 2001 study of Philadelphia fire fighters — partially funded by the IAFF — reached some of the same conclusions in LeMasters' research. It found that fire fighters are at greater risk, compared to the general population, of getting non-Hodgkin's lymphoma and multiple myeloma.

But those studies don't get to the heart of the problem, says Melissa McDiarmid, professor of medicine and director of the University of Maryland Occupational Health Program.

Epidemiological studies measure risk based on the number of fire fighters who



in existing cancer studies proves just one thing — the need for further research.

The IAFF funded and participated in three studies of women in the fire service and the reproductive hazards for female fire fighters, but there are still too few studies on the health of women fire fighters and what role exposure to carcinogens plays in those who are diagnosed with breast, ovarian or cervical cancer.

Many studies also fail to account for the health of IAFF retirees, and that's significant because the physical demands of the job force many fire fighters to retire when they're still relatively young, but their exposure to carcinogens may not lead to cancer until later in life.

"Pinpointing the cause of cancer is extremely difficult because fire fighters aren't exposed to one agent," explains LeMasters. "They're exposed to multiple cancer-causing agents. Because of the multiple exposures and the multiple routes of exposure — they inhale carcinogens, and carcinogens are absorbed through the skin — it is also highly unlikely for fire fighters to get only one type of cancer."

LeMasters was the lead author in the 2006 University of Cincinnati analysis that

have contracted cancer in the past.

McDiarmid argues that there needs to be more emphasis on studying the toxic nature of the fire smoke that fire fighters inhale.

"We have to move from the qualitative to the quantitative," says McDiarmid. "By that I mean moving beyond studies that merely list the toxic substances to studies that quantify concentrations of those substances. That will help refine the risk assessments. It will get us closer to the truth because the risk is higher than the epidemiological studies are indicating."

Hales says, "Until we know more, limiting exposure to carcinogens is crucial."

NIOSH has never conducted its own study of cancer in fire fighters, but Hales and his colleague, Travis Kubale, hope to secure funding for a new cancer study that will examine 22,000 fire fighters in 10 fire departments.

"Prevention is the key, and what I want to find out is whether prevention at the fire ground or prevention in the firehouse is more effective at reducing cancer. That's how we can help," Hales says. ■

State/Provincial Presumptive Disability Laws

Alabamaknown carcinogen which is reasonably linked to the disabling cancer

AlbertaLeukemia, brain, bladder, lung, ureter, kidney, colorectal, non-Hodgkins Lymphoma

Alaskabrain, malignant melanoma, leukemia, non-Hodgkin's lymphoma, bladder, ureter, kidney

Arizonabrain, bladder, rectal, colon, lymphoma, leukemia, adenocarcinoma or mesothelioma

British ColumbiaLeukemia, bladder, lung, skin, liver

Californiademonstrate he or she was exposed to a known carcinogen as defined by the IARC

Coloradocancer of the brain, skin, digestive system, hematological system or genitourinary system

Illinois.....cancer involved must be a type caused by exposure to heat radiation or a known carcinogen as defined by the IARC

Indiana.....cancer that is caused by a known carcinogen to which an individual is at risk for occupational exposure

Kansas.....type of cancer which may in general result from exposure to heat radiation or a known carcinogen

Louisiana.....bladder, brain, colon, liver, pancreas, skin, kidney gastrointestinal tract, leukemia, lymphoma, multiple myeloma

ManitobaLeukemia, brain, bladder, lung, ureter, kidney, colorectal, non-Hodgkins Lymphoma, testicular, esophageal

Marylandhas leukemia or pancreatic, prostate, rectal or throat cancer that is caused by contact with a toxic substance

Massachusettscancer affecting the skin or the central nervous, lymphatic, digestive, hematological, urinary, skeletal, oral or prostate systems, lung or respiratory track

Minnesotacancer of a type caused by exposure to heat radiation or a known or suspected carcinogen as defined by the IARC

Missouri.....cancer affecting the skin or the central nervous, lymphatic, digestive, hematological, urinary, skeletal, oral, breast, testicular, genitourinary, liver or prostate systems, as well as any condition of cancer which may result from exposure to heat or radiation or to a known or suspected carcinogen as determined by the IARC

Nebraskacancer affecting the skin or the central nervous, lymphatic, digestive, hematological, urinary, skeletal, oral or prostate systems

Nevada.....exposed to a known carcinogen as defined by the IARC

New BrunswickIAFF is working to obtain specific language

New Hampshirecancer involved must be a type caused by exposure to heat, radiation, or a known or suspected carcinogen as defined by the IARC (legislation never funded)

New York.....cancer affecting the lymphatic, digestive, hematological, urinary, neurological, breast, reproductive or prostate systems

North Dakotacancer is one which arises due to exposure to smoke fumes or carcinogenic poisonous toxic or chemical substances

Nova Scotia.....cancer or other disease that is prescribed by the Governor in Council by regulation

Oklahomaexistence of any cancer which was not revealed by the physical examination passed by the member upon entry into the department

Ontario.....Leukemia, brain, bladder, ureter, kidney, colorectal, non-Hodgkins Lymphoma, esophageal

Rhode Islanddisabling occupational cancer which develops as a result of the inhalation of noxious fumes or poisonous gases

SaskatchewanLeukemia, brain, bladder, lung, ureter, kidney, colorectal, non-Hodgkins Lymphoma, testicular

South Dakotaimpairment of health caused by cancer

Tennesseecancer resulting in hospitalization, medical treatment or any disability

Texascancer that may be caused by exposure to heat, smoke, radiation or a known or suspected carcinogen as determined by the IARC

Vermont.....limited to leukemia, lymphoma or multiple myeloma and cancers originating in the bladder, brain, colon, gastrointestinal tract, kidney, liver, pancreas, skin or testicles

Virginia.....Leukemia or pancreatic, prostate, rectal, throat, ovarian or breast cancer

Washington.....brain cancer, malignant melanoma, leukemia, non-Hodgkin's lymphoma, bladder cancer, ureter cancer and kidney cancer

Wisconsinskin, breast, central nervous system or lymphatic, digestive, hematological, urinary, skeletal, oral or reproductive systems

State	Heart Disease	Lung Disease	Cancer	Infectious Diseases
Alabama	✓	✓	✓	✓
Alaska	✓	✓	✓	
Arizona			✓	✓
Arkansas				
California	✓		✓	✓
Colorado			✓	✓
Connecticut	✓			
District of Columbia				
Delaware				
Florida	✓			✓
Georgia	✓	✓		
Hawaii	✓	✓		
Idaho	✓	✓		✓
Illinois	✓	✓	✓	✓
Indiana	✓	✓	✓	✓
Iowa	✓	✓		
Kansas	✓	✓	✓	
Kentucky				
Louisiana	✓	✓	✓	✓
Maine	✓	✓		✓
Maryland	✓	✓	✓	
Massachusetts	✓	✓	✓	
Michigan	✓	✓		
Minnesota	✓		✓	✓
Mississippi				
Missouri	✓	✓	✓	
Montana				
Nebraska			✓	
Nevada	✓	✓	✓	
New Hampshire	✓	✓	✓	
New Jersey	pending	pending	pending	pending
New Mexico	pending	pending	pending	pending
New York	✓	✓	✓	✓
North Carolina	pending	pending	pending	pending
North Dakota	✓	✓	✓	✓
Ohio	✓	✓		
Oklahoma	✓	✓	✓	✓
Oregon	✓	✓	pending	pending
Pennsylvania	✓	✓	pending	✓
Rhode Island		✓	✓	✓
South Carolina	✓	✓		
South Dakota	✓	✓	✓	
Tennessee	✓	✓	✓	
Texas	✓	✓	✓	✓
Utah	✓	✓		
Vermont	✓		✓	
Virginia	✓	✓	✓	✓
Washington	✓	✓	✓	✓
West Virginia				
Wisconsin	✓	✓	✓	
Wyoming				
Province				
Alberta	✓		✓	
British Columbia			✓	✓
Manitoba	✓	✓	✓	
New Brunswick				✓
Newfoundland				
Northwest Territory				
Nova Scotia			✓	
Ontario	✓		✓	
Prince Edward Island				
Quebec				
Saskatchewan	✓			
Yukon				