

In the line of duty, fire fighters may experience occupational exposure to gases, chemicals, particulate, and other substances with potentially damaging short and long term effects on the respiratory system. Previous studies performed during knock-down and overhaul phases show firefighters may incur exposure to toxicants and respiratory tract irritants including: sulfur dioxide, hydrogen chloride, phosgene, nitrogen oxides, aldehydes, and particulate. The combustion of building materials generates countless combustion products, with numerous new commercial compounds introduced annually.

Given the excessive exposure of firefighters to respiratory irritants and toxicants, it is essential that firefighters recognize the importance of breathing apparatus use, and take steps to minimize their risk of acute and chronic pulmonary disease. These steps are outlined below.

It is the position of the IAFF Department of Health and Safety that there is an increased risk among fire fighters of developing acute lung disease during the course of firefighting work. There may also be an increased risk of chronic lung disease in fire fighters, however, more research on chronic exposure is needed.

Acute Effects

The short term effects of firefighting on the respiratory system have been studied on numerous occasions with varying results. These studies suggest that acute exposure to contaminants during firefighting:

1) May result in hypoxemia due to smoke inhalation

2) May cause acute respiratory symptoms and acute decrements in lung function. Persistence of these decrements in some cases suggest decrements are not merely caused by irritant bronchoconstriction.

3) May cause acute increases in airway responsiveness.

These changes in lung function occur secondary to a variety of mechanisms which may include reflex bronchoconstriction (constriction of the airways due to lung irritation) and smoke-induced airway hyperresponsiveness.

Chronic Effects

It remains unclear whether or not the repeated exposure to smoke which commonly occurs in firefighting may be linked with chronic pulmonary disease. Several studies have been conducted looking at chronic respiratory related illness and deaths in firefighters. There are indications that repeated inhalations of smoke during routine firefighting activities can result in chronic bronchitis and abnormal lung function.

The results of many of these studies have not been clear cut, probably partly due to what is termed "the healthy worker effect": firefighters, as a group, are healthier than the general population to whom they are compared. A result of the "healthy worker effect" is that fire fighters may appear to have reduced deaths and disease when compared to the general population, when in fact, the occurrence of disease in firefighters may be significantly higher. Additionally, only healthy firefighters stay on the job. Those who become ill may leave the fire service without documented disability before retirement. Others may leave seemingly healthy, only to suffer the long term effects long after their association with the fire service.

What can I do to protect myself?

There a number of steps which can be taken locally to reduce the rate of respiratory disorders.

a) **An Effective Health and Safety Program** - Declining lung function may be detected with periodic and baseline pulmonary function testing (PFTs). This testing allows documentation for treatment and future claims, and ammunition if corrective action needs to be taken. However, pulmonary function testing is only a record of damage which has already occurred. Preventing pulmonary damage is the key.

b) **Training** - It is important that every member of the fire service has an understanding of the respiratory risks of the fire environment, a goal which can only be accomplished through repeated training. People tend to follow rules and regulations more faithfully if they understand why they are adopted and how these procedures will conserve their health.

c) **Use Respiratory Protective Equipment** - Scientific studies show that SCBA equipment is effective in minimizing respiratory exposure to toxicants, carcinogens, gases, and particulate during firefighting activity. However, compliance may often be less than adequate. You can't control what is generated by the fire, but you can control what you breathe. SCBA use is now universally accepted during the knock-down phase, but not during overhaul. Yet, during the overhaul phase many toxic constituents and particulates (such as asbestos) remain in the air, and a firefighter's risk of lung damage is still high. The IAFF strongly supports the use of SCBA's during all phases of fire suppression.

d) **Don't Smoke -** Smoking is strongly associated with chronic, irreversible, debilitating diseases including emphysema, heart disease, and lung cancer. It is ironic to see a firefighter who practices good safety technique by using a SCBA at the fire seen, only to remove it afterward to have a cigarette. Encourage non-smokers not to start and those who smoke to quit. Smoking cessation programs are available through your local union representative and are endorsed by the IAFF. These cessation services are offered at a reduced rate and have been proven effective in helping those who want to quit achieve their goal.

Links for more information

American Lung Association <u>http://www.lungusa.org/</u>

The Canadian Lung Association <u>http://www.lung.ca</u>

IAFF http://www.iaff.org/hs/Resi/lung disease in fire fighters.htm