Why do we love to wear carcinogens?

A review of Plasticizer contamination of firefighter personal protective clothing – a potential factor in increased risks in firefighters Original article written by: BM Alexander and CS Baxter. *Journal of Occupational and Environmental Hygiene* doi: 10.1080/15459624.2013.877142.

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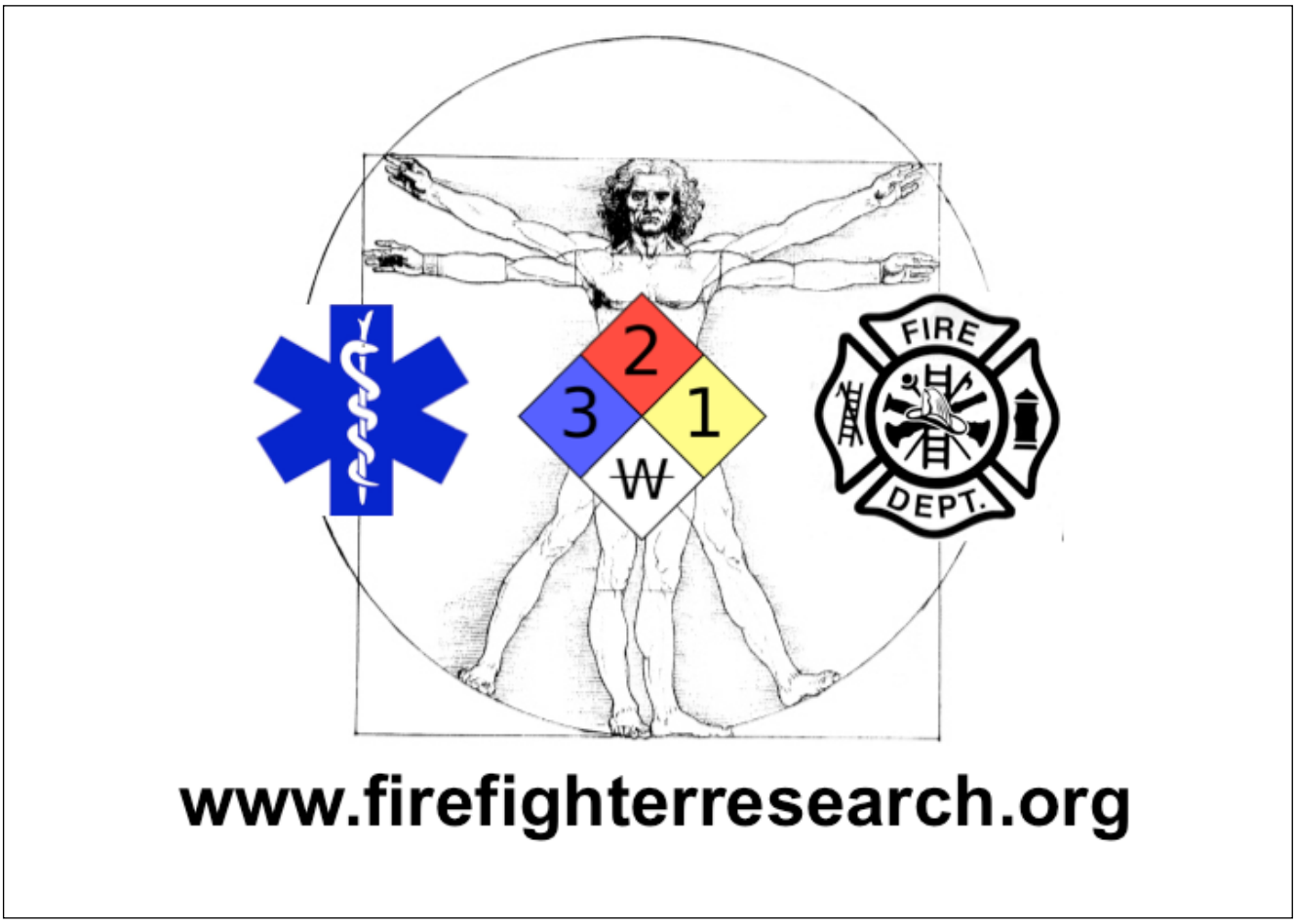

Introduction

How many times have you heard a firefighter with new turnout gear wish for a call so they could get that new gear dirty? Have you ever been guilty of not replacing a hood or pair of gloves because you just got them broken in the way you liked them? We wear soot like a badge of courage and often think the best pictures are those fresh out of a structure fire with a soot covered face. This tradition, however, may be exposing us to unnecessary risks.

Research is starting to make a case for cancer being more common in firefighters than it is in the general population. If we are at greater risk then we have to ask ourselves "why?" and "what can we do about it?". The risk of chemicals and particulates in fire smoke are familiar to us and wearing SCBA is our best protection from that exposure but there are other chemicals left behind after the fire is extinguished. This month we look at a study reporting on contaminants left deposited on turnout gear.

What the study did

Several metro fire departments near Cincinnati, Ohio donated used hoods, gloves, and turnout coats. The investigators took those items and tested the coat wristlets, glove palms, and the chin portion of the hoods for more than 8000 chemicals using a test developed by the EPA.

What the study reported

Twenty-two different chemicals were found on various samples. The chemical di-(2-ethylhexyl) phthalate (DEHP), a plasticizer added to PVC to make it more flexible was found on nearly every item and was present in much higher levels than any other chemical. Chemicals, including DEHP, were found on the inner, middle, and outer glove layers. Interestingly, the skin side of the inner glove layer was visibly dirtier than the opposite side of the same layer.

What it means for the fire service

Many of the chemicals found on turnout gear are known or suspected carcinogens. In animal models, the liver and reproductive tracts are particularly vulnerable to DEHP exposure. In 2008, DEHP was added to the European Union List of Substances of Very High Concern because of its reproductive toxicity. In the United States, the FDA has issued a Public Health Notification urging health care providers to use alternatives to DEHP-containing devices for certain vulnerable patients. In Canada, an expert advisory panel to Health Canada recommended that health care providers not use DEHP containing devices in the treatment of pregnant women, breastfeeding mothers, and infants.

DEHP is slowly absorbed through the skin at room temperature but the absorption may be faster when your gear or skin is warmer than normal. The risk of DEHP to adult male is not clear but it is worth noting that testicular cancer is one of the cancers believed to be more frequent among firefighters. Failing to clean your turnout gear adds to your exposure every time you handle the gear, even long after the fire has been extinguished.

The best thing you can do to reduce your risk is reduce the exposure. When you are at a fire scene, remove your helmet and SCBA and unzip your coat before removing your gloves. Keeping your hands as clean as possible reduces the chance of you depositing soot on the inside of your gloves. You should not put turnout gear back into your personal vehicle after you participate in fire suppression, smoke house, or training fire activities. Grossly decontaminate your gear at the incident and transport it back to the firehouse on a piece of apparatus. Wash your turnout gear after every exposure and replace gloves and hoods that cannot be adequately cleaned.