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Annapolis, MD 21401

## **Testimony concerning SB 476 - Workers' Compensation - Occupational Disease Presumptions - First Responders (Caring for Public Employees in the Safety Professions - CAPES Act)**

Position: Support

Good afternoon, my name is Racquel Cesnalis and I am the Deputy Director for Occupational Health and Medicine at the International Association of Fire Fighters (IAFF). The IAFF is an international union representing over 344,000 professional fire fighters, emergency medical, and rescue workers in the United States and Canada.

I want to thank the committee for the opportunity to support Senate Bill 476 - the Caring for Public Employees in the Safety Professions - CAPES Act, to expand cancer presumption in Maryland to include thyroid, colon and ovarian cancers. This legislation is important to further protect the health and safety of fire fighters.

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Fire fighters have increased and repeated exposure to fire ground toxins like flame retardants, hazardous material chemicals, carcinogenic smoke, and toxic PFAS. Chronic exposures to these substances are why cancer is the number one health issue facing fire fighters.

It has been proven that fire fighters are prone to cancer and certain other illnesses at rates greater than the general population.<sup>1</sup> In a study conducted on cancer incidence and mortality among a large cohort of US career fire fighters, it was found that fire fighters had a 9% increase in cancer incidence and a 14% increase in cancer mortality compared to the general population.<sup>2</sup>

Due to the overwhelming data from these findings and other research studies, in 2022, the International Agency for Research on Cancer (IARC) reclassified the occupation of firefighting from group 2B possibly carcinogenic to group 1 known human carcinogen. Group 1 carcinogen is the highest carcinogenic hazard classification and this classification is made when there is sufficient evidence of carcinogenicity in humans.

It is well known and globally recognized that the risk of cancer is elevated in the fire service. Maryland has previously recognized the threat of cancer on fire fighters by passing *Firefighter Jesse McCollough's Cancer Protection Law* in 2019. This law covers several known occupational cancers for fire fighters including leukemia, throat, brain, prostate, multiple myeloma, rectal, breast, non-Hodgkin's lymphoma, or testicular cancer. While that law was a pivotal step to protect Maryland fire fighters from cancer, presumptive legislation must reflect the latest science. SB 476 is important because it would help to further protect fire fighters in Maryland by recognizing thyroid, colon, and ovarian cancers as presumptive. Fire fighters encounter combustion products of modern residential and commercial fires during fire suppression, overhaul, and salvage activities. They are also routinely exposed to carcinogens from the diesel exhaust of their fire apparatus every single shift, during routine and emergency operations. There is a plethora of data and research linking higher rates of thyroid, colon and ovarian cancers to firefighting. Each of these cancers can be linked to known toxic exposures from firefighting.

Scientific research has proven relationships regarding the fact that fire fighter occupational exposures to combustion by products from fires contain a complex mixture of cancer- causing chemicals which contribute to increased risk and rates of thyroid cancer. Combustion products of wood, coal, and diesel fuel are considered known or probable human carcinogens by IARC. Known occupational physical and chemical exposures fire fighters encounter linked specifically to thyroid cancer include:

- Dioxin<sup>3,4</sup>
- Formaldehyde<sup>5</sup>
- Diesel exhaust<sup>6,7,8,9,10,11</sup>
- Lead/manganese/cadmium<sup>12</sup>
- Fine/ultrafine particulate PM2.5<sup>12</sup>
- Shift work<sup>13</sup>
- Benzene<sup>14</sup>
- PBDE flame retardants <sup>15,16,17,18</sup>
- PCBs, chlorinated naphthalenes, and solvents<sup>19</sup>

In a study of cancer risk among Florida fire fighters, Lee and colleagues identified thyroid cancers in 99 male fire fighters, resulting in a two-fold increased.<sup>20</sup> Increased risk of thyroid cancer was also observed in female fire fighters. As the authors noted, this provides evidence that thyroid cancer risk in their population is not simply due to surveillance (medical screening) bias.

In a meta-analysis of 35 epidemiological cohort studies, there was evidence of positive associations between occupational exposure as a fire fighter and cancer incidence for several sites, including bladder, testis, prostate, thyroid, and colon cancer.<sup>21</sup>

Multiple studies found colorectal cancer risk is elevated in fire fighters.<sup>22</sup> In 2019, Lee and colleagues identified male fire fighters in Florida were noted to be at increased risk of late-stage colon cancer.<sup>20</sup> Daniels and colleagues at the National Institute for Occupational Safety and Health (NIOSH) and National Cancer Institute (NCI) published findings in 2013 from a retrospective cohort study of 29,993 career fire fighters in three US cities. Standardized mortality ratios (SMR) and incidence ratios were calculated for different types of cancer. The study found excess colorectal cancer incidence in fire fighters (SIR = 1.31), and the increased incidence was statistically significant. Mortality from colorectal cancer was also

elevated in fire fighters (SMR=1.31).<sup>23</sup> The SMR of 1.31 means that fire fighters had approximately a 30% greater risk of dying from colorectal cancer compared to non-fire fighters in the general population. Youakim and colleagues found that colon cancer mortality is 1.5 times higher than expected among fire fighters employed 30 or more years and increases to nearly 5 times higher than expected after a fire fighter has 40 or more years of employment; the risk for this malignancy is increased in the group with fewer than 10 years of employment, showing a dose-response relationship between firefighting and colon cancer.<sup>24</sup> Known occupational exposures fire fighters encounter linked specifically to colorectal cancer are: <sup>25,26,27,28</sup>

- Arsenic and arsenic compounds
- Asbestos
- Formaldehyde
- Polychlorinated biphenyls (PCB)
- Tetrachloroethylene
- Diesel and gasoline engine exhaust

A report by LeMasters and colleagues summarized the results of 32 studies on cancer in fire fighters. This study was a meta-analysis, a research technique used to combine many smaller studies. The advantage of this analysis is that research with more participants is better able to detect true increases in risk. In the LeMasters study, the summary risk estimate for colorectal cancer was 1.21 based on 25 total studies with data on colon cancer. This risk estimate was statistically significant, indicating a 21% increased risk for colon cancer in fire fighters.<sup>29</sup> A similar meta-analysis was performed in 2019 by Jalilian and colleagues that synthesized the findings of 50 papers. This study found significantly elevated summary incidence risk estimates for colon cancer 1.14 among fire fighters.<sup>30</sup>

While there is a smaller sample size for studies focusing on female fire fighters, there is sufficient data and evidence to support that elevated incidence and mortality of ovarian cancer may be associated with exposures to endocrine-disrupting chemicals (EDCs), asbestos and benzene. Those toxic substances are found in the fire environment and female fire fighters would be regularly exposed.

Some examples of EDCs fire fighters are exposed to include, but are not limited to, polychlorinated biphenyls (PCBs), polybrominated biphenyls (PBBs), and dioxins which are all commonly found on the

fire ground. A study by Hall and colleagues identified that EDCs at physiological levels enhance the growth of ovarian cancer cells.<sup>31</sup> While this study is not focused on fire fighters it does demonstrate how occupational chemical exposures to known fireground exposures are directly linked to the accelerated growth of human ovarian cancer cells.

In 2011, a Working Group of IARC concluded that there is sufficient evidence for a causal association between exposure to asbestos and ovarian cancer.<sup>32</sup> Fire fighters can routinely be exposed to asbestos while on the job, therefore increasing female fire fighters' risk of developing ovarian cancer. There are also several studies that have reported an increased risk of ovarian cancer in women occupationally exposed to asbestos.<sup>33,34,35</sup> Asbestos exposure in fire fighters is well documented and linked to cancers including mesothelioma. A study by Daniels and colleagues who looked at close to 30,000 fire fighters and found that the risk of death from and diagnosis of mesothelioma were both twice as high as in the general US population.<sup>23</sup>

In a review of medical literature examining the risk for breast cancer, gynecologic malignancies, and lymphoma in the firefighting environment, there were 10 reviewed articles on the association between female reproductive cancers and occupational exposures or environment contaminants.<sup>36</sup> Six substances were recognized as significant occupational exposures for female fire fighters. This includes Benzene and 1,3-butadiene, which have been associated with ovarian cancer in animal studies.<sup>36</sup>

A study exploring how demographic characteristics, life experiences, and firefighting exposures impact cancer among female fire fighters described the types and biologic characteristics of cancers as reported by women in the fire service. The study reported 13 cases of ovarian cancer or precancer out of a total of 256 cases, making it the 8<sup>th</sup> most common malignancy in the study, whereas it occurs much less frequent among women in the general public.<sup>37</sup> This suggests that ovarian cancer may be more prevalent in the fire service than previously recognized. The study also noted that although ovarian and testicular cancer have different clinical courses, ovaries are derived from the same endodermal tissue as testicles, and testicular cancer is commonly elevated among male fire fighters and often covered under presumptive legislation, including Maryland's current presumptive language. Additionally, some respondents noted that

cancers specific to women, such as ovarian cancer, not being covered under presumptive legislation indicated a systemic barrier to supporting women in the fire service.

The research is clear that Maryland's cancer presumption for fire fighters must be expanded to include thyroid, colon and ovarian cancers. It is also important to note that there are many states that already include these cancers. There are 18 states that have presumptive language to include all cancers, 10 states that include thyroid/ endocrine system cancers, 27 states with colon/digestive/intestinal cancers and 10 states with ovarian/reproductive tract cancers.

It is important that Maryland fire fighters have the best protections and benefits if they are diagnosed with an occupational cancer. In conclusion, the IAFF supports passage of Senate Bill 476, and I thank you for the opportunity to speak to all of you today on this very important issue impacting fire fighters.



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