



# Fire Fighter Cancer Awareness and Prevention



## Cancer 101

### WHAT IS CANCER?

Cancer is the general term for a group of more than 100 different diseases that can begin almost anywhere in the body; it starts when cells lose the ability to regulate their growth and grow out of control. These cancer cells can invade and spread to other tissues within the body. This makes it hard for your body to work the way it should. Cancer can develop anywhere in the body.

### HOW IS CANCER RELATED TO FIREFIGHTING?

A number of published scientific studies suggest a link between firefighting and the development of cancer. One of the most telling are the results from the National Institute of Occupational Safety and Health's (NIOSH) 2010 multi-year study evaluating cancer in fire fighters. The results found that mostly digestive, oral, respiratory and urinary cancers were found in fire fighters. The study also identified that there was a two-fold excess of malignant mesothelioma, a very rare cancer. NIOSH identified the most common cancers diagnosed among fire fighters, but there are additional cancers associated with firefighting.

The overview of common cancer found in fire fighters compared to the general population from the NIOSH study is as follows:

- Testicular cancer – 2.02 times the risk
- Mesothelioma – 2.0 times greater risk
- Multiple myeloma -1.53 times greater risk
- Non-Hodgkin's lymphoma – 1.51 times greater risk
- Brain cancer -1.32 times greater risk
- Prostate cancer – 1.28 times greater risk
- Colon cancer -1.21 times great risk
- Leukemia – 1.14 times greater risk
- Esophageal cancer – 1.16 times greater risk

The NIOSH study identified that fire fighters have a 9% greater chance of being diagnosed with cancer and a 14% greater chance of dying from cancer than the general U.S. population.

In 2006, a team of researchers from the University of Cincinnati led by Grace LeMasters released a study comprised of 32 studies from across the United States and several other countries. The study found a direct correlation between the chemical exposures fire fighters experience on the job and their increased risk for cancer.

The researchers found, for example, that fire fighters are twice as likely to develop testicular cancer and have significantly higher rates of non-Hodgkin's lymphoma and prostate cancer than non-fire fighters. The researchers also confirmed previous findings that fire fighters are at greater risk for multiple myeloma.

The findings are also responsible for helping to trigger the International Agency for Research on Cancer (IARC) to classify the occupational exposure as a fire fighter as possibly carcinogenic to humans (Group 2B).

The study determined substances can be inhaled or absorbed through the skin and occur both at the scene of a fire and in the firehouse, where idling diesel fire trucks produce diesel exhaust.

Researchers determined that "there is a critical and immediate need for additional protective equipment to help fire fighters avoid inhalation and skin exposures to known and suspected occupational carcinogens. In addition, fire fighters should meticulously wash their entire body to remove soot and other residues from fires to avoid skin exposure."

## **CANCER TERMINOLOGY**

### **Cancer Identification:**

- **Screening test:** Checking your body for cancer before you have symptoms.
- **Diagnostic test:** A type of test used to help diagnose a disease or condition. Some examples would be mammograms and colonoscopies.
- **Biopsy:** The removal and examination, usually microscopic, of tissue from the living body, often to determine whether a tumor is malignant or benign.
- **Imaging test:** A procedure that creates pictures of internal body parts, tissues or organs to make a diagnosis, plan treatment, check whether treatment is working or observe a disease over time.
- **Tumor:** A mass (lump in the body) formed when normal cells begin to change and grow uncontrollably. A tumor can be benign (noncancerous) or malignant (cancerous, meaning it can spread to other parts of the body).
- **Benign:** Refers to a tumor that is not cancerous. The tumor does not usually invade nearby tissue or spread to other parts of the body.
- **Malignant:** Refers to a tumor that is cancerous. It may invade nearby healthy tissue or spread to other parts of the body.
- **Precancerous:** Refers to cells that have the potential to become cancerous. Also called pre-malignant.
- **Prognosis:** Chance of recovery; a prediction of the outcome of a disease.
- **Stage:** A way of describing cancer, such as where it is located, whether or where it has spread, and whether it is affecting the functions of other organs in the body.
  - o **Stage 0:** cancer in early form
  - o **Stage I:** cancers are localized to one part of the body. Stage I cancer can be surgically removed if small enough.
  - o **Stage II:** cancers are early locally advanced. Stage II cancer can be treated by chemo, radiation or surgery.
  - o **Stage III:** cancers are late locally advanced. The specific criteria for Stages II and III differ according to diagnosis. Stage III can be treated by chemo, radiation or surgery.
  - o **Stage IV:** cancers have often metastasized or spread to other organs or throughout the body. Stage IV cancer can be treated by chemo, radiation or surgery.
- **In situ:** In place. Refers to cancer that has not spread to nearby tissue (also called non-invasive cancer).

- **Metastasis:** The spread of cancer from the place where the cancer began to another part of the body; cancer cells can break away from the primary tumor and travel through the blood or the lymphatic system to the lymph nodes, brain, lungs, bones, liver or other organs.
- **Sarcoma:** A cancer that develops in the tissues that support and connect the body, such as bone, cartilage, fat, muscle and blood vessels.
- **Carcinoma:** Cancer that starts in skin or tissues that line the inside or cover the outside of internal organs.
- **Invasive cancer:** Cancer that has spread outside the layer of tissue in which it started and has the potential to grow into other tissues or parts of the body (also called infiltrating cancer).
- **Localized cancer:** Cancer that is confined to the area where it started and has not spread to other parts of the body. Another term that is used to describe localized cancer is “in situ.”

## **TREATMENT:**

- **Chemotherapy:** The use of drugs to kill cancer cells.
- **Radiation:** The use of high-powered energy beams, such as X-rays or protons, to kill cancer cells.
- **Surgery:** Remove the cancer cells completely or as much as possible.
- **Bone marrow transplant:** The soft, spongy tissue found in the center of large bones where blood cells are formed. A bone marrow transplant, also known as a stem cell transplant, can use your own bone marrow stem cells or those from a donor. It may also be used to replace diseased bone marrow.

## **DOCTORS:**

- **Oncologist:** A doctor who specializes in treating people with cancer.
- **Pathologist:** A doctor who specializes in interpreting laboratory tests and evaluating cells, tissues, and organs to diagnose disease.