FIREFIGHTER CANCER PREVENTION

TAKING ACTION AGAINST OCCUPATIONAL CANCER IN THE FIRE SERVICE

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20 JANUARY 2021

MATERIALS REVISED FROM: HARPER COLLEGE FIRE SCIENCE PROGRAM
LEARNING OBJECTIVES

• DEFINE WHAT CANCER IS AND HOW IT AFFECTS OUR SOCIETY.
• RECOGNIZE THE SCOPE OF THE CANCER PROBLEM IN THE FIRE SERVICE OVER THE PAST SEVERAL DECADES.
• EXAMINE THE CULTURE OF THE FIRE SERVICE REGARDING THE USE OF PPE AND SCBA.
• DISCUSS THE INCREASE IN TOXIC AGENTS IN TODAY’S FIRE ENVIRONMENT AND HOW THAT AFFECTS FIREFIGHTERS.
• IDENTIFY ROUTES OF EXPOSURE TO CANCER-CAUSING AGENTS.
• DISCUSS COMMON FIREFIGHTER EXPOSURES TO CARCINOGENS.
• REVIEW THE STEPS FIREFIGHTERS CAN TAKE TO PROTECT THEMSELVES FROM CANCER.
• CHALLENGE FIREFIGHTERS TO CHANGE THEIR CULTURE.
WHAT IS CANCER?

• CANCER: IS AN ABNORMAL GROWTH OF CELLS WHICH TEND TO PROLIFERATE IN AN UNCONTROLLED WAY AND, IN SOME CASES, TO METASTASIZE (SPREAD).

• CANCER IS A GROUP OF MORE THAN 100 DIFFERENT AND DISTINCTIVE DISEASES.

• CANCER CAN INVOLVE ANY TISSUE OF THE BODY AND HAVE MANY DIFFERENT FORMS IN EACH BODY AREA. MOST CANCERS ARE NAMED FOR THE TYPE OF CELL OR ORGAN IN WHICH THEY START.

• CANCER MAY OCCUR ANYWHERE IN THE BODY. IN WOMEN, BREAST CANCER IS ONE OF THE MOST COMMON. IN MEN, IT’S PROSTATE CANCER. LUNG CANCER AND COLORECTAL CANCER AFFECT BOTH MEN AND WOMEN IN HIGH NUMBERS.
AFFECTS OF CANCER

• ACCORDING TO U.S. CANCER STATISTICS - IN 2016, AN ESTIMATED 1,685,210 NEW CASES OF CANCER WERE DIAGNOSED IN THE UNITED STATES AND 595,690 PEOPLE DIED FROM THE DISEASE.

• THE MOST COMMON CANCERS: BREAST CANCER, LUNG AND BRONCHUS CANCER, PROSTATE CANCER, COLON AND RECTUM CANCER, BLADDER CANCER, MELANOMA OF THE SKIN, NON-HODGKIN LYMPHOMA, THYROID CANCER, KIDNEY AND RENAL PELVIS CANCER, LEUKEMIA, ENDOMETRIAL CANCER, AND PANCREATIC CANCER.
SCOPE OF THE CANCER PROBLEM IN THE FIRE SERVICE

- CANCER IS ONE OF THE MOST DANGEROUS THREATS TO THE HEALTH AND SAFETY OF FIREFIGHTERS EVERYWHERE.
- MULTIPLE STUDIES HAVE PROVEN THE LINK BETWEEN FIREFIGHTING AND CANCER
“Pinpointing the exact cause of cancer is extremely difficult because firefighters are not exposed to just one agent. They are 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 firefighters to get only one type of cancer.”
STUDIES HAVE SHOWN HIGHER RATES OF MULTIPLE TYPES OF CANCERS IN FIREFIGHTERS COMPARED TO THE GENERAL POPULATION INCLUDING:

- **TESTICULAR CANCER** (2.02 TIMES GREATER RISK)
- **MULTIPLE MYELOMA** (1.53 TIMES GREATER RISK)
- **NON-HODGKIN’S LYMPHOMA** (1.51 TIMES GREATER RISK)
- **SKIN CANCER** (1.39 TIMES GREATER RISK)
- **BRAIN CANCER** (1.32 TIMES GREATER RISK)
- **MALIGNANT MELANOMA** (1.31 TIMES GREATER RISK)
- **PROSTATE CANCER** (1.28 TIMES GREATER RISK)
- **COLON CANCER** (1.21 TIMES GREATER RISK)
- **LEUKEMIA** (1.14 TIMES GREATER RISK)
- **BREAST CANCER IN WOMEN** (PRELIMINARY STUDY RESULTS FROM THE SAN FRANCISCO FIRE DEPARTMENT)

SCOPE OF THE CANCER PROBLEM IN THE FIRE SERVICE

“Some cancer studies are also noting that firefighters are developing far more aggressive types of cancers, such as brain cancers, at a younger age than the general population, which provides further indications that the cancer could be a result of firefighting.”

- “Taking Action Against Cancer in the Fire Service” white paper – Firefighter Cancer Support Network -
SCOPE OF THE CANCER PROBLEM IN THE FIRE SERVICE
36% of the 975 firefighters diagnosed with cancer.
Among the 40 to 50 year-old female firefighters in San Francisco, the breast cancer rate is 6 times the national average for that age group.
TOXICITY

• CONTENTS MADE PRIMARILY OF PLASTIC AND SYNTHETIC MATERIALS.
• APPROXIMATELY 84,000 CHEMICALS BEING USED COMMERCIALLY TODAY.
• FLAME RETARDANTS IN FURNITURE.

- “Taking Action Against Cancer in the Fire Service” white paper – Firefighter Cancer Support Network; HBO Documentary film “Toxic Hot Seat” -
TOXICITY

• VEHICLE FIRES RELEASE HIGHLY CONCENTRATED TOXIC CHEMICALS.
• DUMPSTER FIRES CONTAIN UNKNOWN MATERIALS AND TOXIC SUBSTANCES.

- “Taking Action Against Cancer in the Fire Service” white paper – Firefighter Cancer Support Network -
ROUTES OF EXPOSURE

- TWO ROUTES OF GREATEST CONCERN FOR EXPOSURE TO CARCINOGENS:
  - **THE LUNGS**: OCCURS WHEN FIREFIGHTERS DO NOT WEAR OR REMOVE THEIR SCBA TOO SOON.
  - **DERMAL ABSORPTION**: CARCINOGENS ARE ABSORBED THROUGH THE FIREFIGHTER’S SKIN.
• SKIN CAN EASILY ABSORB CHEMICALS – SOME AREAS ARE MORE PERMEABLE THAN OTHERS:
  • FACE, ANGLE OF THE JAW, NECK, THROAT AND GROIN.
  • PERMEABILITY INCREASES WITH TEMPERATURE.
  • SKIN ABSORPTION INCREASES BY 400% FOR EVERY 5° INCREASE IN SKIN TEMPERATURE.

- “Taking Action Against Cancer in the Fire Service” white paper – Firefighter Cancer Support Network -
ROUTES OF EXPOSURE

- **MOST PERMEABLE PIECE OF PPE IS THE HOOD.**

- DESIGNED TO PROTECT THE HEAD AND NECK FROM HEAT.

- NOT DESIGNED TO STOP SKIN ABSORPTION THROUGH THE FOREHEAD, ANGLE OF THE JAW, THE NECK, AND THROAT.

- OFFERS NO VAPOR/MOISTURE OR SMOKE PROTECTION.

- **LIQUID INTEGRITY TEST.**
ROUTES OF EXPOSURE
COMMON FIREFIGHTER EXPOSURES TO CARCINOGENS

• DURING THE OVERHAUL PROCESS
• SOOT PARTICLES
• DIESEL ENGINE EXHAUST
CHARACTERIZATION OF FIREFIGHTER EXPOSURES DURING FIRE OVERHAUL

• TODAY’S SYNTHETIC AND PLASTIC HOUSEHOLD ITEMS PRESENT A RISK TO FIREFIGHTERS EVEN AFTER THE FIRE IS OUT.

• SMOLDERING MATERIALS RELEASE CHEMICALS THAT FIREFIGHTERS CONTINUE TO BREATHE.
CHARACTERIZATION OF FIREFIGHTER EXPOSURES DURING FIRE OVERHAUL

“Carbon monoxide should not be used as an indicator gas for other contaminants found in the overhaul atmosphere.”
CHARACTERIZATION OF FIREFIGHTER EXPOSURES DURING FIRE OVERHAUL

- SAFD CANCER PREVENTION SOP – “SUMMARY OF REQUIRED ACTIONS” SECTION 02 – L:
  - **FULL BUNKER GEAR AND SCBAS SHALL BE WORN THROUGH OVERHAUL OPERATIONS WHEN PRODUCTS OF COMBUSTION AND/OR GASES AND VAPORS ARE PRESENT.**
SOOT PARTICLES

- FIRST REPORTED FORM OF OCCUPATIONAL CANCER ATTRIBUTED TO EXPOSURE TO SOOT.
- PROLONGED EXPOSURE TO SOOT ON THE SKIN IS A HAZARD.
- SOOT PARTICLES ABSORB HAZARDOUS VAPORS AND HOLD THEM IN PLACE ON SURFACES INCLUDING A FIREFIGHTER’S CLOTHING AND SKIN.

- Jeffrey O. and Grace G. Stull – International Personal Protection Inc.; IAFC; IARC -
“A major cause of cancer in firefighters is Polycyclic Aromatic Hydrocarbons absorbed through the skin as a result of contact with soot, persistently and under hot conditions. The especially high permeability of the groin area results in increased testicular cancer and possibly other types of cancer.”

- Dr. Stuart Baxter, PhD, Professor of Environmental Health at the University of Cincinnati -
SOOT PARTICLES

“PEOPLE THINK SOOT IS BENIGN BUT IT IS NOT, AND MOST FIREFIGHTERS COMING BACK FROM A FIRE ARE COVERED IN SOOT. SOOT ISN’T JUST DIRTY, IT’S DANGEROUS”

“SOOT IN A FIREFIGHTERS’ HAIR OR ON THEIR SKIN COULD LEACH CHEMICALS INTO THEIR BODIES. EVERY SMEAR ON THEIR CLOTHES COULD RELEASE TOXIC GASES LONG AFTER THE FIRE IS OUT.”

DR. GRACE LE MASTERS, PHD, DEPARTMENT OF ENVIRONMENTAL HEALTH AT THE UNIVERSITY OF CINCINNATI -
SOOT PARTICLES

• IF NOT REMOVED, CONTAMINATED EXTERIOR SURFACES AND INNER LAYERS OF A FIREFIGHTER’S PPE CAN RESULT IN EXPOSURE WELL AFTER THE FIRE.

• NECK AREA IS ONE OF THE MOST LIKELY AREAS TO BECOME CONTAMINATED.

• CHILDREN BEING EXPOSED TO SOOT PARTICLES ON OUR GEAR.
  • AT HOME
  • DEMOS

- Jeffrey O. and Grace G. Stull – International Personal Protection Inc.-
WET DECON – IMMEDIATE WET DECON IS ESSENTIAL TO REDUCING CONTAMINATES THAT MAY HAVE SETTLED ON YOUR BUNKER GEAR (EX: ASBESTOS). THEREFORE, WET DECON IS REQUIRED ANYTIME YOUR GEAR MAY HAVE BEEN EXPOSED TO PRODUCTS OF COMBUSTION OR OTHER CONTAMINATES, OR IF THE COMPANY OFFICER, BATTALION CHIEF OR INCIDENT COMMANDER DEEMS IT NECESSARY. EVERY EFFORT SHOULD BE MADE TO WET DECON AS SOON AS POSSIBLE, PREFERABLY WHILE STILL ON SCENE. USE A RED-LINE, AT PUMP PRESSURE, WITH A HALF OPENED NOZZLE. RINSE AT A DOWNWARD ANGLE FROM TOP TO BOTTOM.
ACTIONS TO PROTECT YOURSELF FROM CANCER

1. USE BREATHING APPARATUS FROM INITIAL ATTACK TO FINISH OF OVERHAUL.

2. DECONTAMINATE PROTECTIVE EQUIPMENT ON EMERGENCY SCENE TO REMOVE AS MUCH SMOKE PARTICLES AS POSSIBLE.

3. USE SANITARY WIPES TO REMOVE TO SMOKE PARTICLES FROM HEAD, NECK, JAW, THROAT, UNDERARMS AND HANDS WHILE STILL AT EMERGENCY SCENE.

4. WASH YOUR CLOTHES IMMEDIATELY AFTER A FIRE.

5. SHOWER OR CLEAN YOUR BODY THOROUGHLY AFTER A FIRE.
ACTIONS TO PROTECT YOURSELF FROM CANCER

6. CLEAN YOUR PROTECTIVE EQUIPMENT, GLOVES, HOOD AND HELMET AFTER A FIRE

7. CLEAN APPARATUS INTERIOR AFTER A FIRE

8. DO NOT TAKE CONTAMINATED CLOTHES OR PROTECTIVE EQUIPMENT TO YOUR HOME

9. DO NOT TAKE PROTECTIVE CLOTHING INTO LIVING OR SLEEPING QUARTERS

10. DO NOT USE TOBACCO PRODUCTS

11. USE SUNSCREEN
FIREFIGHTER CHALLENGE

• WE ARE ALL RESPONSIBLE FOR OUR OWN SAFETY.

• IF YOU DON’T TAKE CARE OF YOURSELF WHO DO YOU EXPECT TO TAKE CARE OF YOU?

• SAFETY HAS TO BE OUR #1 PRIORITY.

• MORE FIREFIGHTERS ARE DYING EACH AND EVERY YEAR FROM CANCER, FAR MORE THAN ANY OTHER CATEGORY. LODD DOESN’T TELL THE WHOLE STORY!

• WE MUST CHANGE OUR CULTURE AND NOT ACCEPT FIREFIGHTERS NOT USING THEIR PPE & SCBA.

• IT TAKES ALL OF US TO MAKE THIS HAPPEN.

• START TODAY AND START “SAVING OUR OWN!”
STAY SAFE!

Thank you Fire Fighters
God Bless You
We love you
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