

# FIRE SERVICE CANCER AWARENESS TRAINING



## INSTRUCTOR'S MANUAL

**FIRST RESPONDER**  
*Center for Excellence*

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## WELCOME

Due to the changing landscape of building materials, firefighters face a higher risk of contracting cancer than ever before. Advancements in structural firefighting gear afford protections that keep firefighters safer for longer, offering protection from intense heat and limited direct flame contact. Respiratory protection using Self Contained Breathing Apparatus (SCBA) has become the recognized standard when entering environments that pose an immediate danger to life or health (IDLH). However, the structural firefighting ensemble has limitations and it cannot protect the firefighter from the toxic smoke and fine particulates that are encountered during the performance of operational duties.

The soot stained gear that signified a badge of honor for previous generations has now been identified as posing a significant health risk for firefighters. These risks must be well defined and understood by fire service members so that they can adequately protect themselves.

The First Responder Center for Excellence (FRCE) mission is to provide quality educational awareness and research to protect the physical, emotional, and psychological health and wellness of first responders. Raising awareness of occupational cancer risks within the fire service is a priority objective of the FRCE.

After dedicating their lives to the public, fire service members have earned the right to enjoy a retirement from either career or volunteer service. Occupational cancer is robbing too many members of this opportunity. Fortunately, we now know there are measures that can be taken to reduce these risks. Educational resources, such as those being developed and distributed by the FRC, will provide fire service members with the information they need to better protect themselves and change the culture to cut out cancer.



## Training Approach

This training has been organized into a series of three separate modules to allow for distributed training and ongoing discussions. While instructor-led presentation is the preferred method of delivery, the three modules can also be integrated into any distance learning platform to allow for asynchronous delivery.

The cancer awareness training topics have been divided into the following Modules:

- Module I: Occupational Cancer Awareness
- Module II: The Role of PPE and Decontamination
- Module III: Primary Prevention Measures

Resistance to change can be difficult to overcome, especially when proposing modifications to widely accepted behaviors. Change must make sense for people to embrace it. The presentation of the educational material is based on concepts derived from two long standing and widely accepted public health education models (the Health Belief Model and the Health Promotion Model) to ensure effective message delivery and increase student participation and acceptance of behavior modification.

Through the course of these three modules, students will:

- Realize the susceptibility and seriousness of the cancer risks associated with the routine and operational duties of firefighting.
- Understand that the threat of cancer is real and relatable to them and their crew members.
- Be empowered by knowledge that will allow them to protect themselves.
- Be prepared to overcome barriers to implement the necessary changes.
- Commit to implementing risk reducing behaviors which will have long lasting positive effects.

## Understanding Adult Learners

Adults approach and process learning in their own way. Andragogy, the method or process of teaching adult learners, emphasizes that:

- **Adults want to know why they need to learn something**  
Throughout this course, you will see Instructor's Notes that have been prepared for each slide. These notes are a tool to help you, as the instructor, both guide the class and



provide a foundation of why this training is important. At the end of the presentation, there is a comprehensive list of references that were used during the development of this training.

- **Adults need to learn experientially**

As the instructor, it is appropriate for you to provide factual case scenarios relevant to the topic.

- **Adults approach learning with a problem-solving mindset**

Throughout this training, a problem or issue will be introduced. The student will be provided with the tools to help them both recognize and understand the problem. Resources will then be introduced to help the student reach a solution.

- **Adults learn best when the topic is of immediate value**

First responders either have or will experience critical incidents throughout the course of their public safety careers. Critical incidents require a great deal of emotional processing. If left unresolved, occupational stress can accumulate. The cumulative effect of job-related stress can be detrimental to the first responder's job, health, and family.

## Module I Overview

Module I challenges some commonly held cultural beliefs with scientific evidence, informational videos, and case studies. This module is designed to be completed within approximately one hour. Learning objectives include:

- Understanding what defines an occupational risk.
- Awareness that firefighters face increased occupational cancer risk through many aspects of performing their duties – not just while actively firefighting.
- Identification of common carcinogens encountered through daily station activities (e.g., cumulative exposure of diesel exhaust), during the course of training activities (e.g., through destruction of construction materials and from training burns), as well as through the course of active firefighting duties (e.g., smoke, particulates, and other products of combustion).
- Recognizing the risks related to the various routes of exposure (e.g., dermal absorption and inhalation).
- Awareness of legal protections that exist (e.g., presumptive cancer legislation) as well as the necessity to formally track exposures to ensure future recourse.



## Module II Overview

After leaving the IDLH, a firefighter's gear is often covered in a thick film of combustion byproducts. Even when the PPE is worn properly, it is not uncommon for personnel to find soot covering their skin after doffing their gear. Within the fire service culture, dirty gear and dirty skin has often been associated with exemplary efforts and outstanding performance. However, this residual material has been shown to contain a wide variety of carcinogens (which students will have been introduced to during Module I). The longer the toxins remain on the skin and the gear of the firefighter, the higher the health risk they pose.

Module II builds on the concepts introduced in Module I and is designed to be completed in approximately one hour. In Module II, learning objectives include:

- Understanding the importance of proper use of PPE, especially SCBA, from the first moments of initial fire attack all the way through completion of overhaul. The properties of PPE are limited when it comes to protection from smoke infiltration.
- Every significant smoke exposure (not just active fire) should be treated with the same respect, and post-exposure gross decontamination policies, as hazardous materials incidents.
- Gross decontamination should be performed before removal of SCBA and prior to reporting to rehab. This can be performed without compromising the integrity of the gear for further use on the fire ground.
- While in rehab, members should have the opportunity to wipe down their skin to limit the length of exposure to potential carcinogens.
- Crews should adopt a clean cab concept by placing contaminated gear in heavy duty plastic bags for transport back to the fire station.
- Personnel should be given the opportunity to take a shower immediately upon returning to the fire station.
- Living quarters within the fire station should represent a 'cold zone' where contaminated gear is never allowed.
- Protective equipment, such as external exhaust systems, should always be used to reduce exposure of both personnel and equipment to toxic diesel fumes.
- Gear should never be stored in homes due to the risk of off-gassing.
- Following NFPA 1851, as well as manufacturer's recommendations, PPE should be cleaned regularly, as well as after every exposure.



- Department, or even station level, policies should be implemented to encourage risk reduction measures.

## Module III Overview

While rewarding, firefighting can be an incredibly stressful job – mentally and physically. Stress can lead to unhealthy lifestyle choices. To ensure fire service members receive the best protection from developing cancer, they need to understand how the choices they make can influence their risk of developing cancer. Module III reinforces concepts learned in Module I and II, but focuses on cancer risks outside the realm of firefighting.

Upon completion of Module III students should understand:

- That healthy lifestyle choices (e.g., a healthy diet, exercising regularly, and maintaining a healthy weight) can greatly reduce the risk of many cancers.
- Firefighting can entail prolonged on scene times. Fire service members should be prepared by keeping sunscreen in the apparatus at all times.
- Tobacco cessation policies benefit individual health, but they also provide protections for recourse under cancer presumption laws. Students will be provided support resources that may be available to assist with tobacco cessation.
- Annual physicals can provide early cancer detection. The sooner cancer is detected and treated the better the odds of beating it. Annual physicals also serve another important purpose – they provide a record of good health. Previous medical records are required by many states' presumption laws.
- A diagnosis of cancer is not an automatic death sentence and they do not have to face the fight alone. Students will be provided with information regarding partner resources such as the Fire Service Cancer Alliance and the IAFF Cancer Registry.





**MODULE I:  
OCCUPATIONAL CANCER AWARENESS**

## Objectives



- What are carcinogens and where are they found
- What constitutes an occupational exposure
- Potential impact of occupational exposures
- How to protect against occupational exposures
- Understand the importance of exposure tracking
- Become familiar with presumptive cancer legislation

## LECTURE NOTES

- The objectives of this module are to explain:
  - What are carcinogens and where they are found
  - What constitutes an occupational exposure
  - How can occupational exposures impact your health

This training will also provide you with understanding of:

- How you can limit the risk of occupational exposure to carcinogens
- The importance of exposure tracking to protect potential health benefit claims, and
- What presumptive cancer legislation is and help you determine if your state has cancer presumption laws.



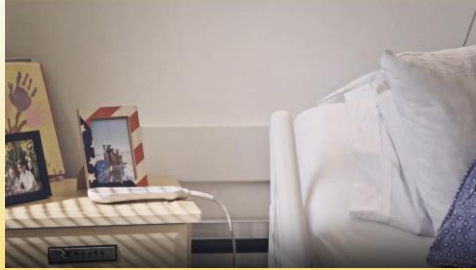
## Glenn's Story...



### LECTURE NOTES

- Throughout this module, we will be hearing about Glenn Preston's story.
- Glenn is a lieutenant with the Boston Fire Department who learned he had developed a form of blood cancer as a result of exposures he encountered on the job.
- We'll hear about how it has affected him, his career, and his family.

## Glenn's Story: Part 1



### LECTURE NOTES

- This 3-minute video clip introduces us to Glenn Preston and his family while also giving some background about his diagnosis of occupational cancer.



## A Sobering Need



- Cancer is a leading cause of fire fighter deaths in the U.S.
- 60% of the names on the Fire Fighters' Memorial are there because of cancer-related deaths

### LECTURE NOTES

- There is a sobering need to address the high rates of cancer among members of the fire service.
- Currently, cancer is recognized as a leading cause of fire fighter deaths in the U.S.
- In fact, over 60% of the names on the IAFF's Fire Fighters' Memorial are there as a result of cancer-related deaths.
- In 2017, the names on the Memorial wall increased by 12%. That means 72% of those line of duty deaths were the result of cancer.
- It is important to understand how and why this particular training was developed.

### DISCUSSION POINT

Now is a good time during the lesson to ask class participants the following questions:

- How many students know someone who has or is fighting cancer?
- How many know a firefighter who has had cancer?
- How many students have had a direct co-worker that has had cancer?



## History of the Fire Service Cancer Alliance



- Formed in January 2015
- Facilitated by the National Fallen Firefighters Foundation
- Collaboration between numerous stakeholders
- Goal was to create a collection of information regarding fire service-related cancer

### LECTURE NOTES

- After hearing Glenn's story, it is easy to understand the rising concern over cancer in the fire service.
- It is important to understand how and why this particular training was developed.
- Facilitated by the National Fallen Firefighters Foundation, the Fire Service Cancer Alliance was created in January of 2015.
- The Alliance was the product of great collaboration between leaders within the fire service, government and the medical and laboratory sciences.
- One recommendation of the Alliance was creation of a **Fire Service Cancer Tool Kit**. The goal of the Tool Kit was to create a comprehensive collection of information on fire service-related cancer.
- This Tool Kit is available online through the First Responder Center for Excellence (FRCE), provides the basis of this training.



## Resource Partners List



- Centers for Disease Control and Prevention (CDC)
- Firefighter Cancer support Network (FCSN)
- International Agency for Research on Cancer (IARC)
- International Association of Fire Fighters (IAFF)
- International Association of Fire Chiefs (IAFC)
- International Association of Women in the Fire and Emergency Services (iWomen)
- National Fallen Firefighters Foundation (NFFF)
- National Fire Protection Association (NFPA)
- National Institute for Occupational Safety and Health (NIOSH)
- National Volunteer Fire Council (NVFC)
- Underwriters Laboratories (UL)
- United States Fire Administration (USFA)

### LECTURE NOTES

- The Fire Service Cancer Alliance includes many major organizations that are responsible for shaping the current landscape of firefighting.
- It is through great partnership with these organizations that we hope to increase awareness of cancer within the fire service and offer recommended safeguards to help protect our members.



**In the News**

  
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www.frcecenter.com

**Cancer is the Biggest Killer of America's Firefighters**



**Firefighter Succumbs to Cancer Contracted from Toxic Infernos**



**Fire Chief Says Occupational Cancer a Major Concern**



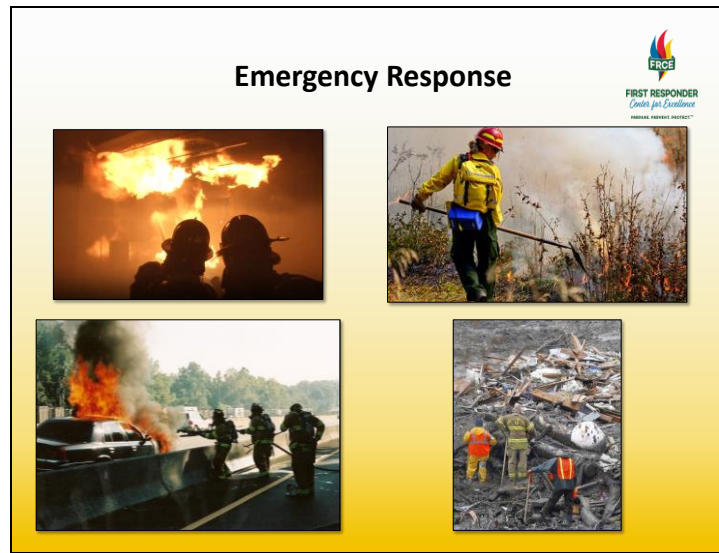
**A Young Firefighter's Story About Cancer**



## LECTURE NOTES

- You do not have to look long or hard to find numerous news articles about firefighters fighting cancer.
- There has been a disturbing trend of otherwise healthy, and often times young, firefighters developing cancer.
- Boston's fire commissioner, Joseph Finn, has declared cancer an epidemic within his department and he has stated that reducing cancer rates within his agency of primary importance.
- There is good news though - thanks to evidence-based research, we can identify the risks, and provide recommendations on how to protect yourself, your family, and your crew.





### **LECTURE NOTES**

- Firefighting is undoubtedly dangerous work.
- Everyday fire fighters around the country answer the call, responding to a vast array of emergencies ranging from structure fires to natural disasters, and from vehicle fires and wildland fires...

## Emergency Response



### LECTURE NOTES

- And from hazardous material incidents to heavy rescue extrications, from mass casualty incidents to requests for emergency medical services.

### DISCUSSION TOPICS

- What are additional incident types you might be expected to run?
- What are the risks you may face while responding to these incidents?

## Emergency Response



### LECTURE NOTES

- During the course of responding to all these emergencies, firefighters face many seen and unseen risks
- One of the unseen, and perhaps underappreciated dangers, is the risk of **occupational exposure to carcinogens**.
- To understand these risks better, we must first understand what a carcinogen is...

## Knowledge Check!



A **Carcinogen** is:

- a) Any hazardous material
- b) A substance that can only enter the body through inhalation
- c) A substance that causes cancer in living tissue
- d) Any chemical encountered during firefighting



### LECTURE NOTES

- Let's perform a quick self-assessment – What is a carcinogen?
- The answer is C – a substance that causes cancer in living tissue



## What is a Carcinogen?



**Carcinogen** (kär-sĭn'ə-jən): A substance or agent that can cause cells to become cancerous by altering their genetic structure so that they multiply continuously and become malignant.

### LECTURE NOTES

- A more in-depth definition of what a carcinogen is, and how it acts, is offered.
- The scientific definition explains that carcinogens are agents that cause an alteration in DNA structure causing them to multiply and spread.
- Simply put, carcinogens are substances that cause cancer.
- By limiting exposure to these toxins we can reduce our risks of developing deadly diseases.

### DISCUSSION POINT

- Ask students to name some other substances they believe to be carcinogens
- Some common examples of carcinogens include:
  - Asbestos
  - Benzene
  - Tobacco Smoke
  - Diesel exhaust



## Occupational Exposure



### What is an Occupational Exposure?

- Includes coming into contact with potentially infectious or disease causing substances or materials
- The contact must be the result of job-related duties
- It is not just bloodborne pathogens anymore!

## LECTURE NOTES

### What is an **Occupational Exposure**?


- An occupational exposure can come in many shapes and sizes.
- Generally, the definition of an occupational exposure is when a fire fighter comes into direct contact with a disease-causing substance or material through the course of their job-related duties.
- Traditionally, occupational exposures have centered around blood and body fluids. However, thanks to a great deal of scientific research, we now know that occupational exposures include much more than just blood and body fluids.
- Unfortunately, exposure to toxic chemicals and carcinogens have the potential to cause serious long-term health complications.

## DISCUSSION POINT

- How many individuals have had training on bloodborne pathogens?
- How many times have you had bloodborne pathogen training?




- How many times have you had occupational cancer awareness training?

  
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### Background

**Sir Percival Pott, 1775**

- English surgeon
- Studied the high occurrence of scrotal cancer among the chimney sweeps of London
- Identified soot as a cancer causing agent
- Published the first-ever report of occupational exposure-related cancer



### LECTURE NOTES

- This isn't the first time in history where a link has been made between occupational exposure and increased risk of cancer.
- In 1775, an English surgeon by the name of Sir Percival Pott noticed a disturbing trend of young, otherwise healthy chimney sweeps developing scrotal cancer.
- Through the course of his work, he was able to link the incidence of scrotal cancer with the chimney sweeps exposure to soot.
- He would go on to publish the first-ever report of occupational exposure-related cancer.

## The Changing Landscape of Firefighting



### Legacy Construction

- Dimensional Lumber
- Cotton, natural fibers
- Solid wood
- Metal
- Glass
- Limited chemical additives, polymers

### New Construction

- Laminated veneer lumber
- Engineered thermoplastics
- Polyurethane foam
- Synthetic fibers
- Complex plastics
- Industrial polymers
- Chemical coatings

## LECTURE NOTES

- Firefighting is not a new occupation – in fact fire fighters have been in existence for hundreds of years.
- So why are we just now seeing such a drastic increase of cancer in the fire service?
- While the basics of the job have largely remained the same the landscape of firefighting, especially over the last four decades, has drastically changed.
- **Legacy Furnishings**
  - A generation ago, firefighters were encountering legacy furnishings that consisted of dimensional lumber, natural materials, and contained limited chemical additives.
- **Modern/New Construction**
  - Due to scientific advancements and a desire to cut costs, the landscape of firefighting now includes laminated veneer lumber, engineered thermoplastics, synthetic fibers and other complex plastics and industrial chemicals.





## **DISCUSSION POINT**

- What are the construction types of buildings are in your response area?
- How has your response area changed over time?
- What safety concerns has the transition from legacy construction to new construction raised?






## **LECTURE NOTES**

- This video is of an Underwriters Laboratory Experiment (approximately 1.5 minutes long) and demonstrates how fire behavior has changed over time due to the introduction of new, synthetic materials.
- **Video Background**
  - The Underwriters Laboratories conducted an experiment with two side by side living room fires.
  - The purpose was to understand the difference between modern and legacy furnishings.
  - The rooms were the same size and contained a similar array of furniture.
- **Modern room consisted of:**
  - Synthetic carpet and padding
  - Plastic toys
  - Foam cushioned sofa
  - Polyester curtains

- **Legacy room consisted of:**
  - Hardwood flooring
  - A number of wood toys
  - A cotton-filled sofa
  - Cotton curtains
- Both rooms were ignited by placing a lit candle on the sofa.
- Both fires were allowed to grow until flashover.
- **The modern room transitioned to flashover in 3 minutes and 30 seconds while it took the legacy room 29 minutes and 30 seconds to reach flashover.**
- This video can also be viewed by visiting: <https://ulfirefightersafety.org/research-projects/comparison-of-modern-and-legacy-home-furnishings.html>



**Carcinogens on the Fire Ground**



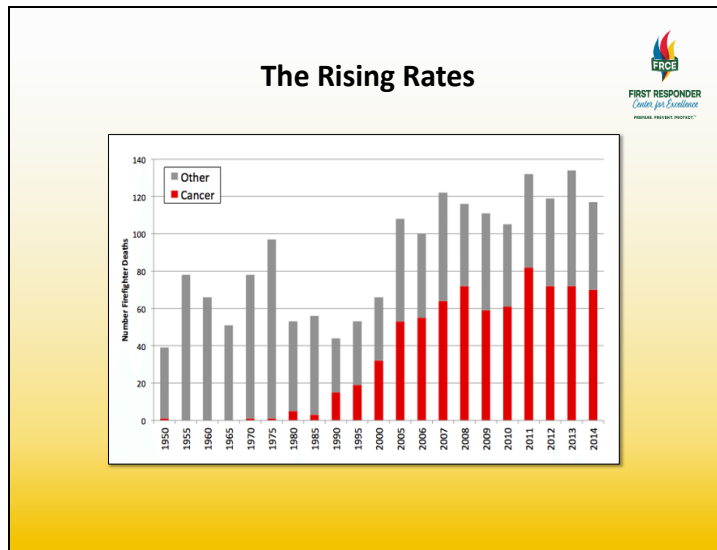
CHEMICAL	USES
Asbestos*	A heat-resistant fibrous silicate mineral that can be woven into fabrics, and is used in fire-resistant and insulating materials such as brake linings
Arsenic	Arsenic-related compounds and alloys have been used in the manufacture of a wide variety of products including pesticides, wood preservatives, and glass products
Benzene*	Is found in furniture wax, and common building materials (paints, adhesives, etc.)
Benzo(a)pyrene*	Is generated as a result of incomplete combustion of organic materials
Polycyclic Hydrocarbons*	Is generated as a result of vehicle exhaust and incomplete combustion of wood or other mixed organic materials
Cadmium	Commonly used as a corrosion-resistant plating on steel, to color glass, and to stabilize plastics
Chlorophenols	Some chlorophenols are used as pesticides, in antiseptics, and can be produced during the process of bleaching wood pulp to make paper
Chromium	Chromium compounds are used for chrome plating, in dyes and pigments, in leather tanning, as wood preserving corrosion inhibitors and in textiles
Carbon Monoxide	Carbon monoxide is an odorless, tasteless gas produced as a result of incomplete combustion
Dioxins*	Commonly released when items containing PVC, such as vinyl flooring, vinyl wallpaper, shower curtains, window frames, electrical equipment and Venetian blinds, are burned
Ethylene Oxide	Found in a variety of detergents, thickeners, solvents, and plastics
Formaldehyde*	Commonly found in cleaning materials and engineered wood-base material such as medium density fiberboard (MDF)
Glutaraldehyde	Used in the tanning process of leather, as a component in cleaning agents, and in the production of adhesives and sealants
Hydrogen Cyanide	Used in the manufacture of synthetic fibers
Orthotoluides	Used in the manufacture of more than 90 dyes and pigments and in synthetic rubbers
Polychlorinated Biphenyls*	Used in electrical equipment (e.g., capacitors), plasticizers, and lubricants
Sulfur Dioxide	Is produced by burning materials containing sulfur, such as household and personal cleaning products
Vinyl Chloride*	Is used to produce PVC and can be found in furniture, upholstery, wall coverings, and housewares

Labels pointing to the table:

- Benzene** (points to Benzene\*)
- PAHs** (points to Polycyclic Hydrocarbons\*)
- Formaldehyde** (points to Formaldehyde\*)
- Hydrogen Cyanide** (points to Hydrogen Cyanide)

## LECTURE NOTES

- As a result of this changing landscape, firefighters now encounter a vast mix of deadly chemicals while fighting fires.
- This list highlights some of the common chemicals detected in the smoke of structure fires.
- Note that the chemicals with an asterisk next to their name have been confirmed by the International Agency for Research on Cancer (IARC) to cause cancer in humans (i.e. they have been confirmed to be carcinogens).
  - **Benzene** is commonly found in furniture wax and new construction building materials.
  - **Polycyclic Aromatic Hydrocarbons (PAHs)** are found in vehicle exhaust and the incomplete combustion of wood or other organic materials.
  - **Hydrogen Cyanide** is used in the manufacture of synthetic fibers.
  - **Formaldehyde** is commonly found in engineered wood-based materials as well as numerous cleaning products.



## LECTURE NOTES

- This chart shows the number of firefighter line of duty deaths since 1950.
- The red portion of each bar graph indicates the number of firefighters who died from cancer.
- As you can see, since 1980 there has been an alarming and increasing trend of occupational cancer related deaths.

### Cancers Associated with Firefighting



- Bladder Cancer
- Brain Cancer
- GI Cancers
- Leukemia
- Lung Cancer
- Kidney Cancer
- Non-Hodgkin Lymphoma
- Melanoma
- Myeloma
- Prostate Cancer
- Testicular Cancer

### LECTURE NOTES

- These are the cancers that are most commonly associated with firefighting and are most likely to be covered by presumptive legislation, which we will talk more about later in this module.
- Due to historically smaller sample sizes, there has been limited evidence based research regarding occupational cancer among females in the fire service.
- There is, however, ongoing research underway studying gender specific cancers among female firefighters.



## Knowledge Check!



### True or False....

When worn properly, structural firefighting gear (also known as bunker or turnout gear) protects the firefighter from coming into contact with smoke and soot.

**FALSE**



## LECTURE NOTES

Let's pause for a quick knowledge check.



## Glenn's Story: Part 2



### LECTURE NOTES

- And now here is a little more about Glenn's story...



## Presumptive Cancer Legislation

### LECTURE NOTES

Fortunately, many states have already recognized the increased cancer risks firefighters face and the majority have enacted presumptive cancer legislation.

### DISCUSSION POINTS:

How many students are familiar with the concept of presumptive legislation?

## Knowledge Check!



Which statement about **Presumptive Cancer Legislation** is true?

- a) Cancer presumption is a federal law
- b) Cancer presumption is automatic for all fire fighters
- c) Cancer presumption laws are different in every state
- d) Cancer presumption laws exist in every state



### LECTURE NOTES

- Let's pause for a knowledge check.



## What is Presumptive Cancer Legislation?



Laws, generally enacted at the state level, establishing that a diagnosis of cancer in a firefighter is the result of duty-related exposure.

- Laws vary considerably
- Usually specific criteria must be met
- Often only certain cancers are covered
- Often a time limit is imposed

### LECTURE NOTES

- Presumptive legislation are state laws establishing that a diagnosis of cancer in a firefighter is the result of duty-related exposure.
- Many states have laws establishing a presumption that certain types of cancer contracted by firefighters are the result of duty-related exposure.
- Each state's presumptive legislation is different, and usually there are specific criteria that must be met – such as record of a pre-employment physical, participation in annual physicals, records of exposures, etc.
- Many states that have enacted presumptive cancer legislation have also imposed time limits as to the period of coverage – for instance coverage may extend for a cancer diagnosis up to 5 years post-retirement.

### DISCUSSION POINTS:

- Does your state have presumptive legislation?
- Do you know what the qualifying criteria are?



## Why is Presumptive Cancer Legislation Important?



- Burden is shifted to the employer to prove that firefighter's cancer was not due to occupational exposure
- Goal is to provide rapid approval and access to benefits

### LECTURE NOTES

- Generally, when dealing with worker's compensation issues, the burden is on the employee to show that their injury occurred during the course of their job related duties.
- With Presumptive cancer legislation the burden of proof is shifted to the employer.
- So, if a firefighter is diagnosed with a covered type of cancer, that disease will be assumed to have occurred due to exposures encountered on the job.
- This allows for faster access to line of duty benefits.

### DISCUSSION POINTS:

- Does your state have presumptive legislation?
- Do you know what the qualifying criteria are?



## Federal Regulations



### James Zadroga 9/11 Health and Compensation Act

- Passed by Congress in 2010
- Reauthorized in 2015 with coverage guaranteed through 2090
- Provides funding for first responders and survivors who experience health complications due to the terrorist attacks

## LECTURE NOTES

- There are also limited federal programs which address cancer within the fire service.
- The James Zadroga 9/11 Health and Compensation Act, which was named after a NY Police officer who developed and died from cancer related to toxic exposures encountered during response to the 9/11 terrorist attack in NYC.
- The Act has been reauthorized to provide funding for all survivors who experience health complications as a result of the terrorist attacks.



## Federal Regulations



### Firefighter Cancer Registry Act of 2018

- Requires CDC to develop and maintain a voluntary registry to track firefighter cancer
- Provides \$2 million in federal funds from 2018 to 2022 for the CDC to gather and study data such as:
  - Status of a firefighter who developed cancer (e.g., volunteer or career)
  - Number of years spent on the job
  - Number & types of incidents they responded to

## LECTURE NOTES

- Also at the federal level, Congress established a voluntary Firefighter Registry to track the prevalence of cancer within the fire service.
- This database will gather important data to further cancer research and prevention.
- The First Responder Center for Excellence (FRCE) has a comprehensive list of states which have enacted presumptive cancer legislation
- The site contains a table which includes the specific language from each states' laws
- It also contains links to the full text of the legislation

**[www.FirstResponderCenter.org](http://www.FirstResponderCenter.org)**

## DISCUSSION POINTS:

- If students have access to the internet, ask them to navigate to the site and determine whether their state has enacted presumptive cancer legislation.
- What are the qualifying requirements for their state?



## Exposure Tracking



### What constitutes an exposure?


- Interaction in environments where any amount of smoke is present constitutes an exposure.
- This includes potentially ANY duration of time.
- The smell of products of combustion indicates a potential exposure.
- Products of combustion do not require visible smoke; inhalation and absorption of low doses can have a potential carcinogenic effect

### LECTURE NOTES

- Interaction in environments where any amount of smoke is present constitutes an exposure.
- This includes potentially ANY duration of time.
- The smell of products of combustion indicates a potential exposure.
- Products of combustion do not require visible smoke; inhalation and absorption of low doses can have a potential carcinogenic effect
- Exposures can, and are likely to, occur during exterior operations when in proximity to products of combustion such as:
  - Vehicle fires
  - Brush fires (trash, tires, fertilizers, pesticides, insecticides and unknowns)
  - Trash/Dumpster fires
  - Driver/Engineer performing pumping operations
  - Incident Commanders (where there is exposure to the command post)
  - Safety Officers
  - Un-deployed Rapid Intervention Crews
  - Crews assigned to an exterior exposure line
  - Unintended exposure of any personnel due to significant wind shift, scene dynamics or complications



## Exposure Tracking



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**Occupational Exposure Tracking Form**

Name: \_\_\_\_\_ Agency: \_\_\_\_\_  
 Position: \_\_\_\_\_ Job #: \_\_\_\_\_

**Incident Information**

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Incident #: \_\_\_\_\_  
 Street Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_

**Incident Type** (Description of this incident)

Structure Fire       Heavy Rescue       Hoist  
 Car Fire       Wild Incident       Other  
 Hazard       Investigation  
 Other: \_\_\_\_\_

**Personal Protective Equipment** (List all PPE used during this incident)

Helmet       WBA       SCBA  
 Firecoat       Respirator Mask       Thermal Protection  
 Fire Pants       Heavy Duty Work Gloves       Safety Boots  
 Air Bottle       Safety Glasses       Safety Vest  
 Other: \_\_\_\_\_

**Operational Role** (List all roles assumed during this incident)

Incident Site Operations       Incident Investigation/Obtaining  
 Incident Site Operations       Incident Site Operations  
 Overhead       Hoist  
 Other: \_\_\_\_\_

**Residual Contaminants** (List all potential hazardous exposures encountered during this incident)

Products of Combustion       Hazardous Materials       Unknown Dust  
 Carbon Monoxide       Construction Debris       Other Exhaust  
 Other: \_\_\_\_\_

**Signs / Symptoms** (List all signs or symptoms experienced during or after this incident)

Cough       Head Ache       Itching  
 Sore Throat       Hoarseness       Sneezing  
 Eye Irritation       Stomach Issues       None  
 Other: \_\_\_\_\_

Notes: \_\_\_\_\_

### LECTURE NOTES

- Exposure tracking is important because it establishes a history of exposure to toxic materials.
- Having a thorough history of occupational exposures becomes very important should an occupational cancer claim ever come under question.
- Keep in mind that exposures can occur on any type of incident, not just structure fires.
- This is a sample form, which can be downloaded, in an electronically fillable format, from the FRC's website.
- Even if you have not been tracking exposure up until this point, it is never too late to start.
- Electronic database records are convenient, but maintaining hard copies of exposure reports is important should the electronic copies become lost.

### DISCUSSION POINTS:

- How many class participants currently work for an agency that utilizes exposure tracking?
- How many class participants have actually used exposure tracking?





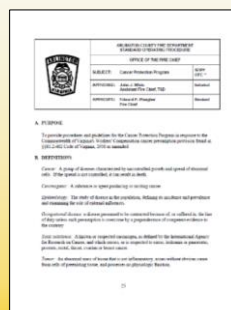
## Sample SOPs



### San Antonio FD Cancer Prevention SOP



### Arlington Co FD Cancer Protection SOP



## LECTURE NOTES

- Many departments have instituted protocols or Standard Operating Procedures to address reduction of exposure risks and to protect employee's future claims (such as requiring exposure tracking)
- There are many sample SOPs in the FRC library that can be used as references in drafting or revising your agency's policies

## DISCUSSION POINTS:

- Has your agency developed SOPs addressing cancer risk reduction and protection?
- If so, what do those SOPs include?



# Prevention checklists



## Officer's Checklist

## Firefighter's Checklist

**OFFICER'S  
CANCER PREVENTION CHECKLIST**

Officers make numerous operational decisions every day which ensure the safety of their crew. How you wear everyday clothes that will reduce the risk of cancer for your personnel with the following provided. It is time to change the culture to not just wear.

**STATION STANDARD**

- Set the example by properly storing PPE at all incidents and ensure crew members do the same.
- Establish policies for mandatory decontamination whenever crew must leave the fire ground. This includes:
  - Using hot lines to perform gross decontamination of bunker gear and SCBAs
  - Providing wet wipes to remove contaminants from all exposed skin
  - Sending crew to B-set gear (if available) until contaminated gear can be cleaned
- Ensure all crew members change and wash uniform clothing immediately upon returning to the station and "Shower within the hour".
- Station policies often include routine washing of apparatus. Similar policies should address the routine washing of hoodies and other PPE.
- Ensure personnel are properly trained and use in station stored without systems.
- Establish policies for proper storage of PPE and provide PPE training quarterly.
- Establish and use personnel injury reporting systems to establish records of exposures.
- Advocate for the establishment of, and participation in, ongoing occupational medical surveillance.

**TRAINING AND TACTICS**

- Treat every fire as a hazardous materials call - because it is.
- Include smoke hazards in planning and briefing sessions and in fire behavior forecasts.
- If possible, conduct overhaul 15 minutes after fire extinguishment to allow time for toxic gases to dissipate and ensure all crews performing overhaul operations continue to wear SCBA.

**CANCER PREVENTION  
CHECKLIST**

Decades of research show that firefighters face an increased risk of developing cancer due to occupational exposures. In fact, cancer is a leading cause of firefighter mortality in the U.S. Fortunately, research has also shown that there are steps that can be taken to reduce that risk. It is time to change the culture to not just wear.

**WHAT YOU CAN DO TO PROTECT YOURSELF**

- Treat every fire as a hazardous materials call - because it is.
- Wear SCBA through all stages of firefighting, including overhaul.
- Perform gross decontamination whenever leaving fire operations, preferably before removing your respirator.
- Bunker gear protects against heat - not carcinogens. In reality, use wet wipes to remove toxic soot from your head, face, neck, underarms, and hands.
- "Shower within the hour" - or as soon as possible after the incident.
- Change and wash uniform clothing, including hood, immediately upon returning to the station.
- Ensure that all gear and apparatus are properly cleaned after the fire. Switch to B-Set gear, if available.
- Keep gear out of living and sleeping areas.
- Do not take contaminated clothing home or store in a vehicle.
- Report every exposure using personnel injury tracking systems.
- Participate in annual medical surveillance. Early detection leads to better outcomes!

## LECTURE NOTES

- Posting informational material and best practice reminders can be a great way to encourage positive behaviors.
- Placing simple checklists in common areas, such as in the apparatus cab, dayroom and in bunkrooms, will serve as a reminder of how firefighters can limit their risks.
- These sample checklists are available for download at the FRC's website.



## Multimedia Training



### IAFF Cancer Awareness & Prevention Course



### Healthy In, Healthy Out



## LECTURE NOTES

- There are ever increasing amounts of information regarding occupational cancer within the fire service.
- Presenting some of these multimedia resources is a great way to perform “quick drills” on this topic and to reinforce the importance of reducing risk of exposures.
- There is an extensive library of training materials in the FRC library available for public use.



### Glenn's Story: Part 3



### LECTURE NOTES

- Now we are going to see an update on Glenn's story...



## Summary



- Examined the increasing rates of cancer within the fire service and identified the most prevalent cancer types
- Defined and identified common fireground carcinogens
- Developed an understanding occupational exposures
- Reviewed what presumptive cancer legislation is and why it is important

## Lecture Notes

- In Module I, we learned about the increasing rates of firefighter cancer and how that inspired the collaboration of many different agencies to produce this training
- We learned what a carcinogen is and how they can be encountered through occupational exposures
- We also looked at presumptive cancer legislation that offers protection to firefighters diagnosed with cancer as a result of line of duty exposure to carcinogens.
- In Module II, we will discuss how to you can reduce your occupational cancer risk while performing your job-related duties.



## Module II: The Role of PPE & Decontamination

## OBJECTIVES



- Understand the limitations of PPE
- Understand why it is important to approach structure fires as hazardous material incidents
- Recognize the need for gross decontamination on scene
- Review how to perform proper gross decontamination in both temperate and cold weather
- Recognize the importance of regular gear cleaning
- Learn other steps that can be taken to further reduce risks both on-scene and at the fire station



## Knowledge Check!



### True or False....

When worn properly, structural firefighting gear (also known as bunker or turnout gear) protects the firefighter from coming into contact with smoke and soot.

**FALSE**

### LECTURE NOTES

Let's pause for a quick knowledge check.





## PERSONAL PROTECTIVE EQUIPMENT DESIGN & LIMITATIONS

### LECTURE NOTES

- We learned about carcinogens in Module I, now we need to take a look at how to limit occupational exposure to these toxins while working on the fire ground.



## Routes of Exposure



The most common routes of exposure to carcinogens during firefighting operations is through:

- Inhalation
- Skin Absorption
- Ingestion (*less likely but can occur during rehydration in rehab*)

### LECTURE NOTES

- The four routes of exposure are:
  - Inhalation
  - Ingestion
  - Injection (parenteral)
  - Absorption
- When it comes to occupational exposure to carcinogens, Inhalation and Absorption are the two most common routes of exposure.



## Respiratory Protection



The SCBA alone can help eliminate one of the three major routes of exposure to fireground carcinogens.



***SCBAs can only protect you if you wear them!***

### LECTURE NOTES

- When worn properly throughout firefighting operations, from the initial fire attack all the way through completion of overhaul, the SCBA provides the greatest level of protection from respiratory exposure to carcinogens.

### DISCUSSION POINT:

- Does your agency currently have SOPs or SOGs in place requiring SCBA use throughout overhaul?
- How many students routinely wear SCBA and full PPE throughout overhaul?

## PPE Construction



### LECTURE NOTES

- This is a picture of a typical fire fighting ensemble featuring proper use of structural firefighting gear, consisting of:
  - Helmet
  - Hood
  - Mask
  - Turnout Coat
  - Turnout Pants
  - Boots
  - Gloves
  - SCBA

### DISCUSSION TOPIC

- Each layer of the structural firefighting ensemble was designed to perform a certain function. What are the 3 layers and what are their intended function?
  - **The Outer Shell** protects firefighters from direct flame while providing abrasion resistance
  - **The Moisture Barrier** protects the firefighter from water and other liquids

- **The Thermal Liner** provides thermal protection from ambient heat
- Which layer protects firefighters from skin exposure to smoke and soot?
  - None of these layers, however, are specifically designed to protect the wearer from smoke or soot.



## PPE Limitations



When worn properly, structural firefighting gear provides the firefighter with a great deal of protection.



**However, none of these components were traditionally designed to protect the firefighter's skin from coming into contact with toxic smoke and soot.**

### INSTRUCTOR'S NOTES

- When worn properly, structural firefighting gear provides the firefighter with a great deal of protection.
  - Gear must fit properly to be effective
- None of these components are specifically designed to protect the firefighter's skin from coming into contact with smoke.
- **Even with proper use, direct skin contamination inevitably occurs due to soot infiltration.**

*Source: (Contamination Control)*

### DISCUSSION TOPICS

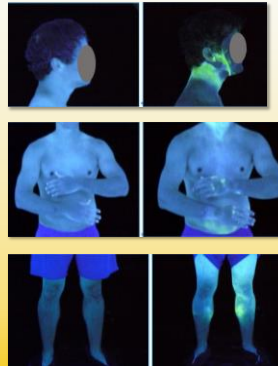
- Can you recall running a structure fire where even though your gear was worn properly, you still found soot on your skin?
- Where was the soot found (e.g., hair, face, neck, arms, legs, etc.)?



## PPE Limitations



- Bunker gear is primarily designed to protect from exposure to heat and direct flame
- Even with proper use, direct skin contamination inevitably occurs



### LECTURE NOTES

- Even when worn properly turnout gear cannot prevent smoke from being deposited on the skin.
- The IAFF conducted a study of smoke exposure, using fluorescent silica powder to simulate smoke particles.
- The firefighter performed several routine duties while being exposed to the simulated smoke and then, before removing his gear the exterior garments underwent gross decontamination to ensure cross-contamination did not occur.
- The photos on this slide clearly show the amount of accumulation that occurred on the skin despite use of full and proper PPE.

***A 5 degree increase of body temperature, can increase skin absorption rates by as much 400%.***

### **LECTURE NOTES**

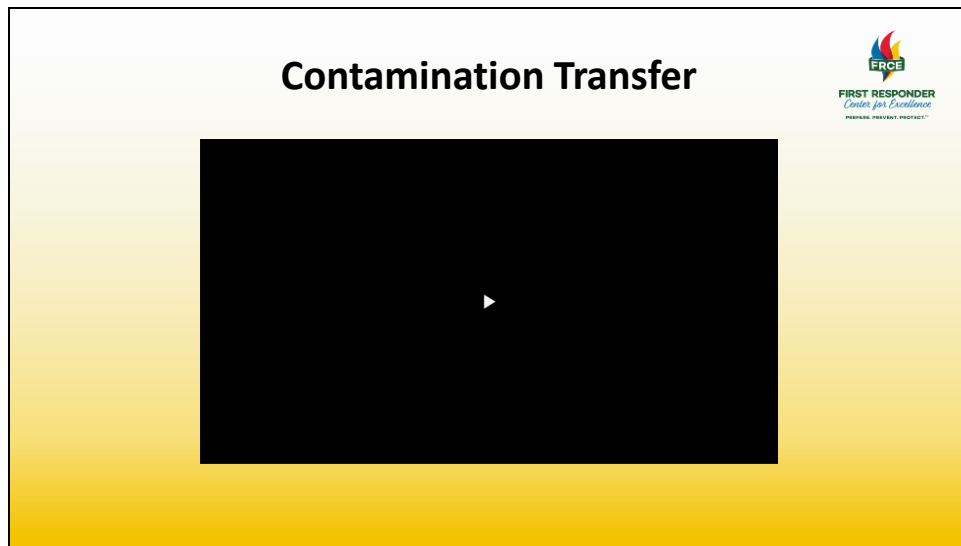
- Heat from structure fires adds to the danger of exposure to carcinogens.
- Skin is the largest organ of the body, accounting for over 6% of entire body mass, and is capable of absorbing substances it comes into contact with.
- Research studies have shown that exposure to higher temperatures can drastically increase the skin's permeability and absorption rates.
- When body temperature rises so does the skin's ability to absorb substances. In fact, a 5 degree increase in body temperature can increase skin absorption rates by as much as 400%.

*Sources: (Hao et al. 2016) (Park et al. 2008) (Holmgaard et al. 2008)*

### **DISCUSSION TOPICS**

- How much do you think your body temperature rises while performing fireground operations?
- Consider what impact this can have on your skin's absorption rate.





### LECTURE NOTES

- Primary contamination occurs when the soot is deposited on the skin during fireground operations
- Secondary contamination, or contamination transfer, is also a significant issue as it increases the spread and exposure to carcinogens
- This 5 minute video demonstrates processes of cross-contamination from bunker gear to individuals, equipment, the fire station, personal vehicles, and even family members.

*Source: (Sylvester Comprehensive Cancer Center's Firefighter Cancer Initiative)*

## FIRE GROUND OPERATIONS

### LECTURE NOTES

- We learned about carcinogens in Module I, now we need to take a look at how to limit occupational exposure to these toxins while working on the fire ground.



## Fires are Hazardous Materials Incidents



### LECTURE NOTES

- During a structure fire, firefighters are exposed to numerous toxic materials including:
  - Benzene
  - Hydrogen cyanide
  - Polycyclic Aromatic Hydrocarbons (PAHs)
- Despite this, fire incidents have not traditionally been handled as hazardous materials incidents.

### DISCUSSION TOPICS

- How could a structure fire be handled differently to provide the same protection and care given to hazardous material incidents? Possible answers may include:
  - A structure fire can be “divided” into zones where the Hot Zone is the IDLH, the Warm Zone is the transitional area away from the IDLH where decontamination occurs, and the Cold Zone is the rehabilitation area.
  - Proper PPE should be worn in all “Hot Zone” areas where exposure to toxins and carcinogens can occur



- Crews can perform gross decontamination prior to doffing their gear
- During a structure fire, firefighters encounter numerous hazardous materials yet it has never been traditionally been handled as a hazardous materials incident. How could a structure fire be handled differently to provide the same protection and care given to hazardous material incidents? Possible answers may include:
  - A structure fire can be “divided” into zones where the Hot Zone is the IDLH, the Warm Zone is the transitional area away from the IDLH where decontamination occurs, and the Cold Zone is the rehabilitation area.
  - Crews can perform gross decontamination prior to doffing their gear



## Fires are Hazardous Materials Incidents



To reduce exposure to carcinogens, firefighters must treat every fire like a hazardous materials incident – because it is!

- This includes establishing on-scene gross decontamination procedures

### LECTURE NOTES

- To reduce exposure to carcinogens, firefighters should treat every fire like a hazardous materials incident – because it is!
- This includes:
  - Establishing on-scene gross decontamination procedures
    - When possible, mark the decon zone to make it readily identifiable for all members leaving the IDLH
  - Placing all apparatus, not involved in fireground operations, uphill and upwind of the incident
    - Closing doors and windows of apparatus to limit potential contamination

### DISCUSSION POINT:

- If you and your crew were responding to a hazardous materials incident involving the release of a chemical, such as hydrogen cyanide (a common fireground carcinogen), how would it be handled?



- During a hazardous materials incident, a hot zone, warm zone, and cold zone would be established.
- Full PPE would be used for the entire duration within the Hot and Warm Zones.
- Full gross decontamination would occur prior to entering the cold zone.
- These measures are all done to protect the responder from any hazardous material.



## Fires are Hazardous Materials Incidents



At each fire incident the following zones should also be established:

- **“Hot Zone”** - SCBA and full PPE must be worn in any areas where exposure is likely to occur (including during exterior ventilation and overhaul operations)
- **“Warm Zone”** - after leaving the IDLH, this is where gross decontamination occurs (prior to removal of SCBA and PPE)
- **“Cold Zone”** - no contaminated PPE should come into the cold zone (this is where firefighter rehab can occur)

### LECTURE NOTES

- To reduce exposure to carcinogens, firefighters should treat every fire like a hazardous materials incident – because it is!
- Just as at a Haz Mat incident, this includes establishing a:
  - A “Hot Zone” where SCBA and full PPE must be worn during both offensive and defensive attack, including during exterior ventilation and throughout overhaul operations
    - This includes any area within the immediate perimeter of any fire or products of combustion (which include smoke and soot).
  - A “Warm Zone” located beyond the IDLH and before rehab, where gross decon occurs prior to removal of SCBA and PPE
    - An area supervisor should be assigned to oversee the “Warm Zone” Gross Decontamination area to ensure proper procedures are followed
    - Firefighters with low air supply should be given priority for gross decontamination



- A “Cold Zone” no contaminated PPE should come into the cold zone, where firefighter rehab (and secondary decontamination) can be conducted

**DISCUSSION POINT:**

- If you and your crew were responding to a hazardous materials incident involving the release of a chemical, such as hydrogen cyanide (a common fireground carcinogen), how would it be handled?
  - During a hazardous materials incident, a hot zone, warm zone, and cold zone would be established.
  - Full PPE would be used for the entire duration within the Hot and Warm Zones.
  - Full gross decontamination would occur prior to entering the cold zone.
  - These measures are all done to protect the responder from any hazardous material.





## Within the Hot Zone



- SCBA should be worn at all times within any “Hot Zone” or other IDLH
  - IDLH can no longer be defined by low readings on a 4-gas meter
  - NFPA 1500 7.10.7\* states, “When in engaged in any operation where members could encounter atmospheres that are IDLH or potentially IDLH, or where the atmosphere is undefined or hazardous (including overhaul), the fire department shall provide and require all members to use SCBA...”
- This not only applies to operational firefighters, but also to scene supervisors, safety officers and fire investigators

### LECTURE NOTES

- At one point in time, a non-IDLH environment was defined by when atmospheric monitors read below 35 parts per million (ppm) of carbon monoxide (CO) and below 5 ppm for hydrogen cyanide (HCN)
- The toxic mix of chemicals can not be measured and determined to be safe based on these simple parameters and, in fact, many of these carcinogens have no correlation with CO and HCN at all
- This applies to scene supervisors and fire investigators, as well as operational firefighters
  - Often times, immediately after a fire is deemed under control, the incident commander, safety officer, and/or fire investigator will enter the structure
  - During this time chemical off gassing is still extremely high and requires SCBA use for adequate respiratory protection



## On Scene Decon



### LECTURE NOTES

- There are two types of decontamination processes:
  - Emergency/gross decon
  - Technical/secondary decon
- The decon process presented in this Module refers to an immediate gross decon following exposure to productions of combustion.
- Decon kits, such as those used as examples here, should be placed on all engine companies
- A decon kit does not have to be costly, it can be assembled by collecting the following items:
  - stiff bristle brush – used to scrub PPE during the gross decon process immediately after leaving the IDLH
  - Soap – follow your structural firefighting gear manufacturer’s recommendation for the appropriate soap to use during gross decon
  - Low pressure hose – a low pressure hose should be used during the decon process



- This garden hose setup is preferred as it will provide a flushing with sufficient flow but lower water pressure which better eliminates the possibility of embedding particulate / toxins further into fabric.
- It is also easier to control water flow and direction while performing the Gross Decon process
- Adapter – an appropriate adapter (such as a 2 1/2 to 3/4 (GHT) reducer) should be kept with the kit to ensure the engine will be able to provide water via the low pressure hose
- Bucket – for storage and use during the scrub process



## “Hot Zone” Gross Decontamination



- As soon as is practical, the decon area should be established in the Warm Zone
- This area should be readily identifiable and accessible to firefighters as they leave the IDLH

### LECTURE NOTES

- As soon as is practical, the decon area should be established in the Warm Zone
- This area should be readily identifiable and accessible to firefighters as they leave the IDLH
- Cones should be used to designate the decon area on the fireground
- Nearby a “Drop Zone” should be established where PPE will be left, after completing gross decon, and prior to reporting to rehab

## Gross Decontamination



### LECTURE NOTES

- Immediately upon exiting the Hot Zone, firefighters should proceed to the decon area
- Firefighters should remain on air and those with low air supply should be given priority
- Firefighters should begin by rinsing off debris and products of combustion in a systematic and thorough manner from the collar-line down; being mindful of higher potential collection points such as the armpit and groin areas.
  - Firefighters should try not saturate the inner lining of the PPE.
  - The goal is to keep the PPE operationally dry on the interior, but rinsed as clean as possible on the exterior.
  - stiff bristle scrub brushes and department-approved soap/cleaner should be used to facilitate the cleaning process. (NFPA 1851 and the manufacturers' recommendations should be followed when cleaning PPE).
- To facilitate Gross Decon of multiple personnel, additional Decon Hose Lines from other nearby suppression apparatus can be used.
- After rinsing the exterior portion of the PPE, firefighters can go off-air and begin to doff their PPE.

- If possible, should be left in a prepared Drop Area located within the Warm Zone



## “Hot Zone” Gross Decontamination



### LECTURE NOTES

- In this real-time video footage of an Underwriter’s Laboratory research burn, the gross decontamination of an entire engine company is achieved in under 3 minutes
- It is important to note the following:
  - Immediately after leaving the IDLH, the engine company reports to the gross decon area, while remaining on air
  - The firefighter with lowest air supply is given priority for initial decontamination
  - In this method of decon, the firefighter is:
    - Initially sprayed down with water from a low pressure source
    - Sprayed with a soap solution
    - Scrubbed with a stiff bristle brush
    - Rinsed prior to leaving the decon area
  - The firefighter remains on air and with gloves on until the gross decontamination is complete



## Dry Brush Decontamination



### LECTURE NOTES

- In this video, provided by the United Women Fire Service San Francisco and inspired by the Skelleftea Model, demonstrates the dry brush alternative to complete gross decontamination
  - Though not ideal, dry brush decontamination does reduce exposure to potential carcinogens and can be used when conditions do not allow for a full gross decontamination

*Source: (United Fire Service Women San Francisco)*





## Decontamination in Rehab



### LECTURE NOTES

- In rehab, firefighters should wipe down all exposed skin, including the face, neck, arms and hands, with clean, wet towels or wet wipes
- This reduces both absorption and ingestion of potentially deadly carcinogens

## Remove Contaminated Clothing



- Limit exposure by removing contaminated clothing as soon as possible
- Maintain a personal "Go-Bag" with a clean uniform that can be accessed after any incident where exposure to harmful substances has occurred. clean footwear, hat, towel, sun protection, etc

### LECTURE NOTES

- Limit exposure by removing contaminated clothing as soon as possible
- Maintain a personal "Go-Bag" with a clean uniform that can be accessed after any incident where exposure to harmful substances has occurred.
- Recommended items include:
  - Department approved uniform or jumpsuit
  - Socks
  - Clean footwear
  - Towel
  - Sun protection, etc.



## Keep Your Cab Clean



After the fire, bag gear and, if possible, transport in an outside compartment. This reduces secondary transfer of contaminants and limits exposure during transport back to the station.



### LECTURE NOTES

- Although gross decontamination reduces the amount of contamination on PPE, gear should be bagged to protect firefighters from secondary transfer of contaminants and additional exposure during transport
- When bagging gear, gloves should be worn and carefully discarded as to limit cross-contamination
  - The bag opening should be twisted and taped (or otherwise) closed, then “goose-necked” (folded over on itself, and twisted and taped a second time). This procedure greatly minimizes any off-gassing.
- Firefighters should switch into a second set of gear, if available, and have the contaminated gear cleaned in an appropriate gear extractor
- Gear manufacturers can provide specific instructions for the cleaning of their gear (including specific water temperatures and spin cycles) – this not only ensures proper cleaning but it also protects and increases the longevity of the gear itself.
- Some departments have established Hood and Glove Swap policies



- Personnel determined to have been exposed to products of combustion due to IDLH source proximity can have their hood and fire gloves exchanged prior to leaving the scene (often by a cache maintained by the Safety Officer).
- The exposed PPE components can then be properly cleaned before being placed back into circulation.

**DISCUSSION TOPICS:**

- Does your department provide specific policies for the handling and cleaning of structural firefighter gear?
- If gear was contaminated by body fluids or a hazardous material how would it be treated?
- In those situations how would gear be transported back to the fire station?
- After a structure fire, how is gear typically handled and transported by you and your crew?



## Transport of Contaminated Gear



### LECTURE NOTES

- In this example, gear is encapsulated in individually numbered bags and placed in an exterior compartment of the apparatus
- Should the crew receive another call for service while returning to the station, they can quickly identify and access their individual gear
- This method of gear management helps to maintain a clean cab, limits ongoing exposure to contaminated gear, while still maintaining operational readiness...

*Source: (United Fire Service Women San Francisco)*



## Use Vehicle Exhaust Extractors



Diesel fuel has been identified by the IARC as a known human carcinogen and is known to accumulate on surfaces such as floors, walls, and gear.

### LECTURE NOTES

- The International Agency for Research on Cancer (IARC) has identified diesel exhaust as a known human carcinogen
- Vehicle exhaust extractors not only keep the air in the apparatus bay clean, but they also keep toxic dust from accumulating on floors, walls, apparatus, gear, and anything else that may be stored in the bay
- In addition to regular use of vehicle exhaust extractors:
  - Doors to living quarters should remain closed at all times to limit infiltration of diesel exhaust into living quarters
  - Bay floors should never be dry swept – a HEPA shop vac or wet mopping should only be used for cleaning purposes
  - Consumables, such as food or ice machines, should not be stored in the bay



## “Shower Within the Hour”



- Clean yourself before your tools, apparatus, and other equipment
- The longer the contamination remains on your skin the greater your exposure to potential carcinogens

### LECTURE NOTES

- Clean yourself before your tools, apparatus, and other equipment
- The longer the contamination remains on your skin the greater your exposure to potential carcinogens
- After taking a shower change into a clean uniform
- Then go about performing a more thorough cleaning of PPE, equipment, and apparatus



## Wash All PPE



### LECTURE NOTES

- Ideally, structural firefighting gear should be washed after each exposure, per manufacturer recommendations, in a gear extractor or through professional laundering
  - A gear extractor is not the same as a household washing machine, it is a specialized industrial cleaner that is designed to lift carcinogens and other toxic material from gear
  - It is important to use the cleaning solutions and exact settings recommended by your gear manufacturer to ensure PPE is properly cleaned and not damaged
  - Extractors are costly and may not be available at all departments – gear can be cleaned by hand using stiff bristle brushes and appropriate specialized cleansers
- If the bagged, contaminated gear cannot be taken out of service or washed in an extractor, the gear should be:
  - Removed from the bags
  - Further hand-cleaned using a stiff bristle brush and an appropriate, specialized cleansing solution (see manufacturer recommendations)
  - Hung to dry & allow for further off-gassing:

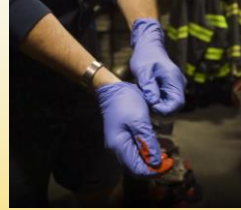




- Away from living quarters
  - Out of direct sunlight (which can damage the material)
  - A fan can be utilized to help speed drying
- Be sure to also thoroughly clean helmets (inside and out), face masks, and boots



## Take Extra Precautions



***At all times, treat PPE as if it is contaminated...***

### LECTURE NOTES

- Always use nitrile gloves when handling any potentially contaminated gear
- As is done in EMS, always remove nitrile gloves as if they were contaminated

# Record and Report All Exposures



The image shows a sample 'Occupational Exposure Tracking Form' from the First Responder Center for Excellence. The form is titled 'Occupational Exposure Tracking Form' and includes fields for Name, Position, Agency, and Unit. It is divided into several sections: 'Incident Information' (Date, Time, Incident #, Street Address, City, ZIP), 'Incident Type' (Description of the incident) with checkboxes for Structure Fire, Car Fire, Hazmat, Investigation, Heavy Rescue, and Standby; 'Personal Protective Equipment' (List of PPE used during the incident) with checkboxes for Helmet, SCBA, Socks, Bunker Coat, Suppression Boots, Station Uniform, Bunker Pants, Suppression/Work Gloves, Station Boots, Fire Hood, Safety Glasses, and Safety Glasses; 'Operational Role' (List of roles assumed during the incident) with checkboxes for Interior Fire Operations, Exterior Fire Operations, Overhead, Standby, and other; 'Possible Exposures' (List of potential hazardous exposures encountered during the incident) with checkboxes for Products of Combustion, Hazardous Materials, Airborne Dust, Carbon Monoxide, Construction Debris, and Diesel Exhaust; and 'Notes / Symptoms' (List of signs or symptoms experienced during or after the incident) with checkboxes for Cough, Head Ache, Nausea, Wheeze, Chest Pain, Vomiting, Skin Rash, Irritation, and None. A 'Notes:' field is provided at the bottom.

## LECTURE NOTES

- If your department does not have a formal occupational exposure reporting system, it is important to advocate that one be established
- If your department does have a formal way of exposure tracking and reporting, it is still wise to maintain your own personal record of exposures
- Should you ever need to file a claim for an occupational illness, having a verifiable record of exposures may be of the utmost importance
- This sample, electronically-fillable form provided by the FRC is just one of many that are available and is free to use (visit [www.firstrespondercenter.org](http://www.firstrespondercenter.org))



## AT THE STATION

### LECTURE NOTES

- Now let's take a look at how to limit occupational exposure and cross-contamination of carcinogens while at the fire house.



## Maintaining a Clean Cab



Part of the daily apparatus check should include a wipe down of all hard surfaces...

### LECTURE NOTES

- Maintaining a clean cab means more than just bagging gear after incidents, each day all hard surfaces should be wiped down to limit toxic exposure and reduce potential for cross-contamination
- When performing the cab cleaning be sure to properly wear, doff, and discard PPE (such as nitrile gloves)

## Wash Your Hands



- Do not unintentionally carry toxic substances home with you
- Wash your hands – it not only helps stop the spread of disease, it also reduces the transfer of toxic contaminants

### LECTURE NOTES

- Washing your hands not only helps stop the spread of illness, it also reduces the transfer of toxic contaminants

## Properly Bag, Store & Transport Gear



- Soot covered gear poses its own risk
- Contaminated gear can continue to transfer and off-gas contaminants for prolonged periods of time
- Contamination can occur in the station, not just on the fire ground
- Risks from off-gassing increase when gear is kept in confined spaces, such as personal vehicles

***Off-gassing from gear poses a risk to firefighters  
AND their families...***

### LECTURE NOTES

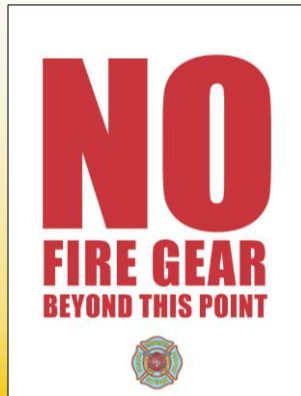
- The risk of occupational exposure to carcinogens does not end once crews leave the fire ground.
- As operations conclude, the soot covered gear which provided protection in the IDLH environment actually begins to pose a risk to firefighters by prolonging exposure to carcinogens.
- Studies have confirmed that when PPE becomes coated in the toxic agents encountered during firefighting, the gear itself can continue to transfer and off-gas contaminants long after the incident has ended.
- The danger of off-gassing becomes heightened when career or volunteer firefighters transport or store their gear in their personal vehicles. This poses a potential risk to both firefighters and their families.

### DISCUSSION POINTS:

- How often is gear stored or transported in your vehicle?



## Properly Bag, Store & Transport Gear



Gear should be kept separate from living quarters at all times.

### LECTURE NOTES

- The risk of occupational exposure to carcinogens does not end once crews leave the fire ground.
- As operations conclude, the soot covered gear which provided protection in the IDLH environment actually begins to pose a risk to firefighters by prolonging exposure to carcinogens.
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### DISCUSSION POINTS:

- How often is gear stored or transported in your vehicle?





## Dangers at Home



### LECTURE NOTES

- This is a picture of a fairly common set up within a fire station, where the gear is stored in the bay near the apparatus.
- Bunker gear stored in the apparatus bay can continue to accumulate contaminants from diesel exhaust over time.
  - The IARC has identified diesel exhaust as being associated with increased cancer risk.
- This means firefighters may be placed at an increased risk before they ever leave their stations.
- This also means Bunker gear may be exposing firefighters to carcinogens and increasing their cancer risk.
- If possible, gear should be stored outside of the apparatus bay in a separate gear room (also away from living quarters)

### DISCUSSION POINTS:

- Where do you store gear within your fire station?



## Ongoing Medical Surveillance



- Ongoing Medical Surveillance is an important industry term that refers to participation in annual medical physicals
- If your department does not have a formal ongoing occupational medical surveillance program then advocate to have one established
- Use your employer sponsored health benefits to have an annual physical
- As we learned in Module I, many presumptive cancer laws require participation in medical surveillance programs

***By participating in an annual physical, you may be protecting your rights, and those of your family, to future claims should an occupational illness occur.***

### LECTURE NOTES

- Ongoing Medical Surveillance is an important industry term that refers to participation in annual medical physicals
- If your department does not have a formal ongoing occupational medical surveillance program, then advocate to have one established
- Use your employer sponsored health benefits to have an annual physical
- As we learned in Module I, many presumptive cancer laws require participation in, and records from, medical surveillance programs
- Protect your rights, and your health, by having your annual physical

*(The specifics of annual physicals for firefighters is discussed in greater detail in Module III.)*



## SUMMARY



- Understand the limitations of PPE and risk of cross contamination
- Recognize the need for gross decontamination on scene and reviewed how to perform proper gross decontamination
- Recognize the importance of proper personal hygiene, and regular gear and apparatus cleaning
- Take additional steps to further reduce risks of occupational cancer both on-scene and at the fire station





## LECTURE NOTES

It is time to change the culture to cut out cancer.

## **Module III: Primary Prevention Methods**



## OBJECTIVES



- Learn about how lifestyle choices can impact your overall risk of cancer
- Identify the positive and negative personal choices that may be impacting your health
- Learn how to reduce your risk off the job so you reduce your risk overall



## Definition of Wellness



**Wellness** - an individual's state of mind as well as their physical state, balancing between health and physical, mental, emotional and spiritual fitness.

### LECTURE NOTES

- Wellness is a term that refers to an individual's state of mind as well as their physical state, balancing between health and physical, mental, emotional and spiritual fitness.
  - Wellness also includes awareness and practice of healthy choices to establish a balanced lifestyle.

*Source: (The Emergency Services Roadmap to Health and Wellness)*

### DISCUSSION TOPIC

- What are some factors that positively contribute to your level of wellness?
- What are some factors that negatively contribute to your level of wellness?



## The Impact of Lifestyle Choices



Although genetics influence the risk of cancer, most of the variation in cancer risk across populations and among individuals is due to factors that are not inherited.

### LECTURE NOTES

- Although genetic susceptibility influences the risk of cancer, most of the variation in cancer risk across populations and among individuals is due to factors that are not inherited.
- A recent study demonstrated that nonsmoking (former and never smokers) adult men and women whose lifestyles were most consistent with the 2006 American Cancer Society (ACS) cancer prevention guidelines for weight control, diet, physical activity, and alcohol had a significantly lower risk of dying from cancer, cardiovascular disease, or all causes combined.
- We have already learned that firefighters face increased risk of developing cancer, but now in Module III we will look at the other risk factors.

*Source: (American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention) (Following Cancer Prevention Guidelines Reduces Risk of Cancer, Cardiovascular Disease, and All-Cause Mortality, McCullough et al.)*





## Eat Healthy/Maintain a Healthy Weight



- One-third of cancer deaths can be attributed to diet & physical activity habits
- It is important to avoid excess weight gain at all ages.
  - For those who are currently overweight or obese, losing even a small amount of weight has health benefits and is a good place to start.
- Maintain a healthy Body Mass Index (BMI)

### LECTURE NOTES

- One-third of the more than 572,000 cancer deaths that occur in the United States each year can be attributed to diet and physical activity habits
- Maintain a healthy Body Mass Index (BMI)
  - **Body Mass Index (BMI)** - Body mass index (BMI) is a measure of body fat based on height and weight
- Engage in regular physical activity and limit consumption of high-calorie foods and beverages
- Avoid excess weight gain at all ages. For those who are currently overweight or obese, losing even a small amount of weight has health benefits and is a good place to start.



# Eat Healthy/Maintain a Healthy Weight



		Body Mass Index Table																																					
		Normal							Overweight							Obese							Extreme Obesity																
BMI		19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54		
Height (inches)	Body Weight (pounds)																																						
58	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167	172	177	181	186	191	196	201	205	210	215	220	224	229	234	239	244	248	253	258			
59	84	89	104	109	114	119	124	129	133	138	143	148	153	158	163	168	173	178	183	188	193	198	203	208	212	217	222	227	232	237	242	247	252	257	262	267			
60	87	102	107	112	116	121	126	131	136	141	146	151	156	161	166	171	176	181	186	191	196	201	206	211	216	221	226	231	236	241	246	251	256	261	266	271	276		
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190	195	201	206	211	217	222	227	232	238	243	248	254	259	264	269	275	280	285	290		
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	196	202	207	213	218	224	229	235	240	246	251	256	262	267	273	278	284	289	295			
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197	203	208	214	220	225	231	237	242	248	254	259	265	270	276	282	287	293	299	304			
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204	209	215	221	227	232	238	244	250	256	262	267	273	279	285	291	296	302	308	314			
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324			
66	118	124	130	136	142	148	154	160	166	172	178	184	190	196	202	208	214	220	226	232	238	244	250	256	262	268	274	280	286	292	298	304	310	316	322	328	334		
67	121	127	134	140	146	152	158	164	170	176	182	188	194	200	206	212	218	224	230	236	242	248	254	260	266	272	278	284	290	296	302	308	314	320	326	332	338	344	
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230	236	243	249	256	262	269	276	282	289	295	302	308	315	322	328	335	341	348	354	360	366	
69	129	135	142	149	155	162	169	176	182	189	196	203	210	216	223	230	236	243	250	257	263	270	277	284	291	297	304	311	318	324	331	338	345	351	358	365	371	378	
70	133	139	146	153	160	167	174	181	188	195	202	210	216	222	229	236	243	250	257	264	271	278	285	292	299	306	313	320	327	334	341	348	355	362	369	376	383	390	
71	138	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250	257	265	272	279	286	293	301	308	315	322	329	336	343	351	358	365	372	379	386	393	400	407
72	143	147	154	161	169	177	184	191	199	206	213	221	228	235	242	250	258	265	272	279	287	294	302	309	316	324	331	338	346	353	361	368	375	383	390	397	404	411	418
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265	272	280	288	295	302	310	318	325	333	340	348	355	363	371	378	386	393	401	408	415	423	
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272	280	287	295	303	311	319	326	334	342	350	358	365	373	381	389	396	404	412	420	428	435	
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279	287	295	303	311	319	327	335	343	351	359	367	375	383	391	399	407	415	423	431	439	447	
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287	295	304	312	320	328	336	344	353	361	369	377	385	394	402	410	418	426	435	443	451	459	

Source: Adapted from Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report.

## LECTURE NOTES

- One-third of the more than 572,000 cancer deaths that occur in the United States each year can be attributed to diet and physical activity habits
- Maintain a healthy Body Mass Index (BMI)
  - BMI outside of the “Normal Range” (either below or above) can have potential negative health consequences.



## Eat Healthy/Maintain a Healthy Weight



Bagel		Pepperoni Pizza	
20 Years Ago	Today	20 Years Ago	Today
3-inch bagel 140 calories	6-inch bagel 350 calories	2 slices of a large pepperoni pizza 500 calories	2 slices of a large pepperoni pizza 850 calories
Today's bagel has 210 more calories.		Today's pizza has 350 more calories.	

Soda		Popcorn	
20 Years Ago	Today	20 Years Ago	Today
6 ½ ounces regular soda 85 calories	20 ounces regular soda 250 calories	Box of popcorn 270 calories	Tub of popcorn 630 calories
Today's soda has 165 more calories.		Today's popcorn has 360 more calories.	

*This table illustrates the change in portion sizes from 20 years ago with today's portions.*

### LECTURE NOTES

- In general, portion sizes have grown over the years. They are much larger now than 20 years ago.
- Perhaps one of the easiest ways to achieve a healthy BMI, is by controlling portion size of meals and snacks.
  - Portion Size – The amount of food or drink a person chooses to eat or drink at one time.
- This table illustrates the change in portion sizes from 20 years ago with today's portions.
- Other important ways to achieve a healthy BMI is by engaging in regular physical activity and limiting the consumption of high-calorie foods and beverages



## Eat Healthy/Maintain a Healthy Weight



- Consume a healthy diet, with an emphasis on plant foods.
- Eat at least 2.5 cups of vegetables and fruits each day.
- Limit consumption of processed meat and red meat.
- Choose whole grains instead of refined grain products.

### LECTURE NOTES

- The America Cancer Society also provides the following recommendations for eating healthy and maintaining a healthy weight:
  - Consume a healthy diet, with an emphasis on plant foods.
  - Eat at least 2.5 cups of vegetables and fruits each day.
  - Choose foods and beverages in amounts that help achieve and maintain a healthy weight.
  - Limit consumption of processed meat and red meat.
  - Choose whole grains instead of refined grain products.

## Tobacco Use



- Smoking causes more deaths each year than the following causes combined:
  - Human immunodeficiency virus (HIV)
  - Illegal drug use
  - Alcohol use
  - Motor vehicle injuries
  - Firearm-related incidents
- More than 10 times as many U.S. citizens have died prematurely from cigarette smoking than have died in all the wars fought by the United States.
- Smoking causes about 90% (or 9 out of 10) of all lung cancer deaths. More women die from lung cancer each year than from breast cancer.

### LECTURE NOTES

- Cigarette smoking increases risk for death from all causes in men and women.
- The risk of dying from cigarette smoking has increased over the last 50 years in the U.S.
- Even people who smoke fewer than five cigarettes a day can have early signs of cardiovascular disease.
- Smoking damages blood vessels and can make them thicken and grow narrower. This makes your heart beat faster and your blood pressure go up. Clots can also form.
- **Smoking causes more deaths each year than the following causes combined:**
  - Human immunodeficiency virus (HIV)
  - Alcohol use
  - Illegal drug use
  - Motor vehicle injuries
  - Firearm-related incidents
- More than 10 times as many U.S. citizens have died prematurely from cigarette smoking than have died in all the wars fought by the United States.
- Smoking causes about 90% (or 9 out of 10) of all lung cancer deaths. More women die from lung cancer each year than from breast cancer.

*Source: (CDC)*



## Tobacco Use



### Smoking can cause cancer almost anywhere in your body:

- Bladder
- Blood (acute myeloid leukemia)
- Cervix
- Colon and rectum (colorectal)
- Esophagus
- Kidney and ureter
- Larynx
- Liver
- Oropharynx (throat, tongue, soft palate, and the tonsils)
- Pancreas
- Stomach
- Trachea, bronchus, and lung

***If nobody smoked, one of every three cancer deaths in the United States would not happen.***

### LECTURE NOTES

#### • Smoking can cause cancer almost anywhere in your body:

- Bladder
- Blood (acute myeloid leukemia)
- Cervix
- Colon and rectum (colorectal)
- Esophagus
- Kidney and ureter
- Larynx
- Liver
- Oropharynx (includes parts of the throat, tongue, soft palate, and the tonsils)
- Pancreas
- Stomach
- Trachea, bronchus, and lung

*Smoking also increases the risk of dying from cancer and other diseases in cancer patients and survivors.*

#### • **If nobody smoked, one of every three cancer deaths in the United States would not happen.**

#### • Additional risks from tobacco use include:

- Smoking affects the health of your teeth and gums and can cause tooth loss.
- Smoking can make it harder for a woman to become pregnant. It can also affect her baby's health before and after birth. Smoking increases risks for:
  - Preterm (early) delivery



- Stillbirth (death of the baby before birth)
  - Low birth weight
  - Sudden infant death syndrome (known as SIDS or crib death)
  - Ectopic pregnancy
  - Orofacial clefts in infants
- Smoking can also affect men's sperm, which can reduce fertility and also increase risks for birth defects and miscarriage.
  - Smoking can affect bone health.
    - Women past childbearing years who smoke have weaker bones than women who never smoked. They are also at greater risk for broken bones.

*Source: (CDC)*



## Tobacco Use



Many support resources exist to help you quit:

- Department sponsored smoking cessation programs
- Health insurance plans often offer smoking cessation programs
- Family Physician can offer support

***Using quit-smoking medicine or counseling support can more than double your chances to quit for good!***

### LECTURE NOTES

- The ACA allows for insurance companies to charge smokers up to 50 percent more than non-smokers through a tobacco surcharge.
- Many support resources exist to help you quit:
  - Department sponsored smoking cessation programs
  - Health insurance plans often offer smoking cessation programs
  - Family Physician can offer support





## Tobacco Use



- If you quit and then relapse, accept it, work out why it happened, and focus on how you can avoid it in future.
- It can take several efforts to quit for good but if you are determined, you will do it.

### LECTURE NOTES

- If you quit and then relapse, accept it, work out why it happened, and focus on how you can avoid it in future.
- It can take several efforts to quit for good but if you are determined, you will do it.
- Remember, every try counts and has positive health benefits!

## Tobacco Use



### Benefits of Quitting Smoking:

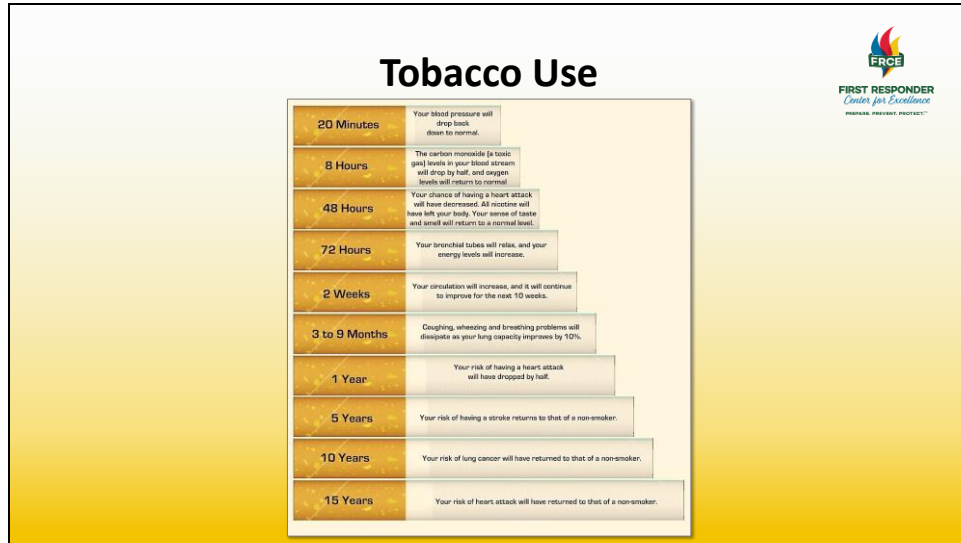
- Decreased risk of lung and other associated cancers
- Improved cardiovascular health
- Increased longevity
- Increased energy
- Financial Savings
- Food tastes better
- Breath, clothes, and hair smell better

### LECTURE NOTES

- **Benefits of Quitting Smoking:**

- Decreased risk of lung and other associated cancers
- Improved cardiovascular health
- Increased longevity
- Increased energy
- Financial Savings
- Food tastes better
- Breath, clothes, and hair smell better





### LECTURE NOTES

- After 20 Minutes - blood pressure returns to a normal level
- After 8 Hours – Carbon monoxide in the bloodstream is cut in half
- After 3 Days – breathing becomes easier
- After 2 Months – circulation improves and lung function increases up to 30%
- After 1 Year – the risk of heart attack is reduced by half
- After 5 Years – the risk of stroke is reduced to that of a non-smoker
- After 10 Years – the risk of lung cancer is reduced to that of a non-smoker
- After 15 Years – the risk of heart attack is reduced to that of a non-smoker

## Limit Alcohol Consumption



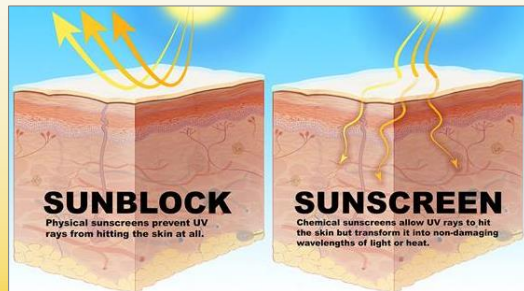
If you drink alcoholic beverages, limit consumption.

- Drink no more than 1 drink per day for women or 2 per day for men.

### LECTURE NOTES

- If you drink alcoholic beverages, limit consumption.
  - Drink no more than 1 drink per day for women or 2 per day for men.
- Keep in mind that different drink types have varying concentrations of alcohol (as illustrated by the picture). The following would be equivalent to “1 drink”:
  - 12 oz of beer with an alcohol content of 5%
  - 12 oz of hard cider with an alcohol content of 5%
  - 5 oz of wine with an alcohol content of 12%
  - 1.5 oz of “hard alcohol” (distilled) with an alcohol content of 40%

## Sunscreen Saves More than Just Your Skin



Broad spectrum sunscreen with an SPF of 15 or higher helps prevent sunburn and reduces the risk of skin cancer (melanoma and squamous cell carcinomas) associated with UV radiation.

### LECTURE NOTES

- Melanoma is the deadliest form of skin cancer.
- Nearly 90% of melanomas are caused by overexposure to ultraviolet (UV) radiation, either from natural or artificial sources.
- When used as directed with other sun protection measures, broad spectrum sunscreen with an SPF of 15 or higher helps prevent sunburn and reduces the risk of early skin aging and skin cancer (melanoma and squamous cell carcinomas) associated with UV radiation.
- Keep sunscreen readily available - in the rig and in the station.
- Use it both on duty and off
- UV is a danger on overcast days as well during the winter – sunscreen should be used during any prolonged exposure to sunlight
- Wearing a hat can also reduce exposure to UV radiation

*Source: (Melanoma Research)*



## Reduce Stress



- Mental health can have a direct and long lasting affect on physical health
- To maintain mental health and wellness:
  - Engage in physical exercise and hobbies outside of work
  - Take advantage of peer support networks
  - Use EAP programs and other professional counseling services
  - Take time away from the job and to connect with family & friends
- Mental health is similar to physical health – the sooner you deal with an issue the better

### LECTURE NOTES

- Mental health can have a direct and long-lasting effect (Hao, Ghosh, Newman, Kasting, & Raney, May 2016) (Park, Lee, Kim, & Prausnitz, 2008)on physical health
- Maintain mental health and wellness by:
  - Engage in physical exercise and hobbies outside of work
  - Take advantage of peer support networks
  - Use EAP programs and other professional counseling services
  - Take time away from the job and to connect with family & friends
- Mental health is similar to physical health – the sooner you deal with an issue the better



## Ongoing Medical Surveillance



- It is important to participate in annual medical examinations
  - Early detection leads to better outcomes
  - This medical record could become very important to support a claim of occupational cancer should the situation ever arise

### LECTURE NOTES

- A first step toward ensuring wellness is participating in annual ongoing medical surveillance
- Ongoing medical surveillance is another term for having your physical
- It is important to participate in annual medical examinations
  - Early detection leads to better outcomes
  - This medical record could become very important to support a claim of occupational cancer should the situation ever arise



## Ongoing Medical Surveillance



NFPA 1582 “Standard on Comprehensive Occupational Medical Program for Fire Departments” emphasizes the need for complete, specific, annual medical evaluations and it provides:

- Measurements to ensure a member is able to perform their essential job functions
- Member insights to their fitness level and to encourage them to improve
- Referenced screening tools

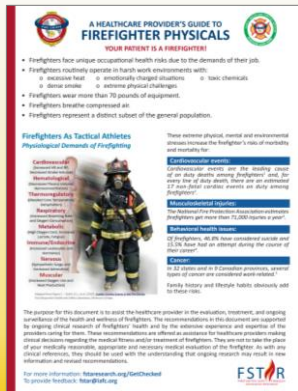
### LECTURE NOTES

- NFPA 1582 “Standard on Comprehensive Occupational Medical Program for Fire Departments” emphasizes the need for complete, specific, annual medical evaluations
  - The complete language of NFPA 1582 can be found by visiting [www.NFPA.org](http://www.NFPA.org)
- The Standard outlines components that specific to the physical and mental demands of emergency services jobs





## Ongoing Medical Surveillance



- Not all physicals are created equal
- Be sure your doctor understands what you do, the nature of your job, the substances (and carcinogens) you are exposed to
- Reference sheets are available

### LECTURE NOTES

- Not all physicals are created equal
- Be sure your doctor understands what you do, the nature of your job, the substances (and carcinogens) you are exposed to
- Reference sheets are available by visiting the International Association of Fire Chief's page and downloading the "Healthcare Providers Guide to Firefighter Physicals"
- At minimum, firefighters should receive the following during an annual evaluation:
  - Vitals: BP, HR, RR, Wt
  - Body Fat Percentage
  - Multi-System PE: skin, mouth, thyroid, vascular, neurologic and musculoskeletal
  - Labs: CMP, CBC, Lipid Panel, TSH
  - Urinalysis, HbA1c
  - Testing: 12-lead EKG, eye exam, hearing test, oxygen saturation
  - Family History: CVD, sudden cardiac death, diabetes and cancer Personal Health Behaviors: tobacco use, alcohol, exercise, dietary habits



## Summary



- Lifestyle choices can greatly impact your overall risk of cancer.
- Tobacco cessation, proper nutrition and weight maintenance, reduced alcohol consumption, stress management and use of sunscreen all reduce the risk of cancer.
- Ongoing medical surveillance is important for early detection, better outcomes, and to protect potential work-related benefits.

### LECTURE NOTES

- Lifestyle choices can greatly impact your overall risk of cancer.
- Tobacco cessation, proper nutrition and weight maintenance, reduced alcohol consumption, stress management and use of sunscreen all reduce the risk of cancer.
- Ongoing medical surveillance is important for early detection, better outcomes, and to protect potential work-related benefits.



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