

# Post Incident Decontamination

Cancer Prevention Initiatives for Fire Services

## Introduction

- John Lapins
- 6 Years of Service
  - Industrial with Suncor's Fort Hills Project since 2012-current
  - Municipal with Rocky View County since 2016-current
- Goal for this presentation:
  - Bring awareness to the Fire Service Leaders in regards to cancer prevention and post incident decontamination.

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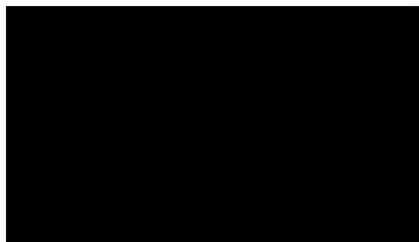
## Proposal For Suncor

- Initiated at morning meeting in Kitchen
  - News article – Father/Son cancer diagnosis
- Previous exposure to post incident decon policy at RVC
  - Led to discussion on steps we can take to protect ourselves
- Proposal brought to officers and chief at quarterly meeting in 2018
- Plan initiated and put in place Feb 5<sup>th</sup> 2019

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## Boston Fire Department Video

- This video is one that I shared with the department
- RVC used this video in the probationary orientation.



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# Research

## NIOSH

- Data collected from 1950-2009
- 29,000 cases from 3 major studies
- 14% increase in mortality rates from cancer

## Nordic

- Data collected from 1961-2005
- Examined diagnosis vs mortality
- Significant increase in prostate cancer diagnosis
- Other specific cancers linked:
  - Malignant melanoma
  - Non melanoma skin cancer
  - Mesothelioma

## LeMasters

- 2006 University of Cincinnati
- Quantitative statistical analysis
- Pooled data from 32 independent studies
- Significant increase in cancer diagnosis:
  - Testicular (102%)
  - Multiple myeloma (53%)
  - Non Hodgkin Lymphoma (51%)
  - Skin Cancer(39%)
  - Prostate cancer(28%)
  - Malignant melanoma(32%)
  - Brain cancer(32%)
  - Rectum cancer(29%)
  - Stomach cancer(22%)
  - Colon cancer(21%)

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# Contaminants

- Polycyclic Aromatic Hydrocarbons
  - Large group of chemicals that are formed during incomplete combustion of organic materials
  - Classified as having the highest carcinogenic potential - US EPA toxicity rating scale
- Exhaust
  - Often overlooked as a significant carcinogen in our field of work
  - Preventative measures:
    - Use diesel exhaust systems in fire halls
    - Limit amount of time trucks are running without ventilation

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## Route of entry - Inhalation

### Underwriters Laboratories - Firefighter Exposure to Smoke Particulates

- Silent Hazard
- Materials are off gassing more aggressively
- 99% smoke particles are < 1 micron
- 97% too small to see with the eye
- Clean air is not clean



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## Route of entry - Inhalation

### Recommendations:

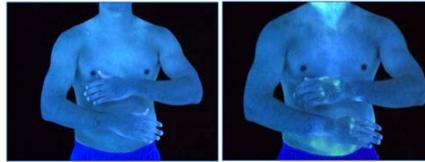
- Wear SCBA long after fire is extinguished
- Do not rely solely on multi gas detectors to determine PPE doffing

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## Route of entry - Absorption

CDC, US Department of Health, NIOSH -  
Evaluation of Dermal Exposure to PAH in  
Firefighters

- 1 fire per day for 3 days
- Tested skin, breath and urine samples
- Control levels were taken
  - Samples were elevated on skin immediately after fire
  - Samples on breath and urine after prolonged testing post fires



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## Route of entry - Absorption

### Recommendation's

- Wash and Shower ASAP after response
- Launder Uniforms and turnout gear ASAP

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# NFPA 1500 2018

## Standard on Fire Department Occupational Safety, Health and Wellness Program

### Chapter 14 – Exposure to fire ground toxic contaminants

1. Training
2. Prevention and mitigation
3. Cleaning and maintenance
4. Mitigation of fire ground toxic contaminants exposure
5. APR use in post fire environment
6. Post incident exposure
7. Exposure reporting requirements

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# Fort Hills Decontamination Procedure

## When to implement:

- IC's discretion of significant exposure to contaminants

## Each Member was assigned a personal decontamination kit

- Kit contents
  - Gloves
  - Bags to contain gear
  - Wet wipes
  - Coveralls
  - Garbage bags
- Cheap/disposable materials
- Flexible options

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# Fort Hills Decontamination Procedure

## On Scene Decontamination

- All bunker gear is gross decontaminated on scene
- All contaminated gear and SCBA is contained and sealed; transported outside the passenger compartment if possible
- Personal wipes used to remove surface contaminants from skin
- Coveralls are donned to protect cab from contaminants.

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# Fort Hills Decontamination Procedure

## Back At Hall Decontamination

- Members directly involved with attack or most contaminated go and shower/change immediately
- All Gear and equipment is taken out of service until laundered or cleaned by manufactures recommendation
- Cab of apparatus is deep cleaned with surface wipes and upholstery cleaner if required.

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## Program Initiation Process

- All members completed training:
  - PowerPoint on department process
  - PPE cleaning training – compliant to NFPA1851
- All apparatus were deep cleaned
- All members washed their bunker gear
- All members issued their personal kits

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## Program Cost

- Breakdown of materials:
  - Total Cost was under \$2000 for 21 members and all equipment
  - Major components in place with design/build of the fire hall
    - PPE washer + dryer
    - Exhaust system
- Cost/Member for the Decon Kit Items
  - Each kit was approx. \$11

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## Program Flexibility

- Numerous ways to implement changes
  - Use what works for your departments needs
    - Make the program attainable
- Open to program improvement and revision.
  - Feedback from the crews/captains
  - Eventually will become seamless SOG/SOP

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## Change in Culture

- Pushback from introduction to safety measures
  - SCBA
- Dirty = Experienced
- Public Exposure
- Education
- Proactive measures

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## Conclusion

- Firefighter Cancer Support Network Recommendations

**WHAT IMMEDIATE ACTIONS  
CAN I TAKE TO PROTECT MYSELF?**

- 1  
Use SCBA from initial attack to finish of overhaul. (Not wearing SCBA in both active and post-fire environments is the most dangerous voluntary activity in the fire service today.)
  - 2  
Do gross field decon of PPE to remove as much soot and particulates as possible.
  - 3  
Use Wet-Nap or baby wipes to remove as much soot as possible from head, neck, jaw, throat, underarms and hands immediately and while still on the scene.
  - 4  
Change your clothes and wash them immediately after a fire.
  - 5  
Shower thoroughly after a fire.
  - 6  
Clean your PPE, gloves, hood and helmet immediately after a fire.
  - 7  
Do not take contaminated clothes or PPE home or store it in your vehicle.
  - 8  
Decon fire apparatus interior after fires.
  - 9  
Keep bunker gear out of living and sleeping quarters.
  - 10  
Stop using tobacco products.
  - 11  
Use sunscreen or sun block.
- The importance of annual medical examinations cannot be overstated — early detection and early treatment are essential to increasing survival.

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## Resources

- Video Resources:
  - The Silent Killer (23 mins) –
  - [https://www.youtube.com/watch?v=fyZ\\_HQM9Z\\_c](https://www.youtube.com/watch?v=fyZ_HQM9Z_c)
  - Cancer Prevention in the Boston Fire Dept. (8 mins) –
  - <https://www.youtube.com/watch?v=bXd5sb6fWNM>
  - Healthy in Healthy Out – (7 mins) –
  - <https://www.youtube.com/watch?v=bXd5sb6fWNM>
  - Firefighter Cancer Support Network (12 mins) –
  - <https://www.youtube.com/watch?v=bXd5sb6fWNM>
  - SKNLUV - Firefighters and Cancer Training (42 mins) –
  - <https://www.youtube.com/watch?v=WvNgDpZjEBA>

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## Resources

- Articles:
  - NIOSH
    - [https://www.cdc.gov/niosh/firefighters/pdfs/dahm\\_et\\_al\\_2015-508.pdf](https://www.cdc.gov/niosh/firefighters/pdfs/dahm_et_al_2015-508.pdf)
  - Nordic
    - <https://oem.bmj.com/content/71/6/398.long>
  - LeMasters
    - <http://www.iaff.org/hs/pdf/cancer%20risk%20among%20firefighters%20-%20uc%20study.pdf>
  - UL. Firefighter Exposure to Smoke Particulates
    - <https://ulfirefightersafety.org/docs/EMW-2007-FP-02093.pdf>
  - CDC, US Department of Health, NIOSH Evaluation of Dermal Exposure to PAH in Firefighters
    - <https://www.cdc.gov/niosh/hhe/reports/pdfs/2010-0156-3196S.pdf>
  - Contamination of firefighter personal protective equipment and skin and the effectiveness of decontamination procedures
    - <https://www.tandfonline.com/doi/full/10.1080/15459624.2017.1334904>
  - How to slow firefighter cancer for \$30
    - <https://www.firerescue1.com/fire-products/Personal-protective-equipment-ppe/articles/147295018-How-to-slow-firefighter-cancer-for-30/>

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## Questions?

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