

**FIREFIGHTING AND
OCCUPATIONAL
CANCER
HELSINKI**




ALEX FORREST



Exposure to Cancer-Causing Agents, Over Time, Makes a Person More Susceptible to Cancer

**WINNIPEG FIRE OFFICER, 28 YEARS EXPERIENCE AS A FIRE FIGHTER
PRESIDENT OF UNITED FIRE FIGHTERS OF WINNIPEG, LAWYER
CANADIAN TRUSTEE, INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS
AUTHOR OF NUMEROUS ARTICLES ON FIRE FIGHTERS AND CANCER**

**THE TRAGIC IRONY
OF OUR JOB!**



NO LONGER A DEBATE

**STUDY AFTER STUDY SHOWS A
CONNECTION BETWEEN FIREFIGHTING
AND OCCUPATIONAL CANCER**
(LAMASTERS, GUIDOTTI, MONASH UNIVERSITY
AND KOREAN STUDY)

**OUR JOB IS GETTING
MORE DANGEROUS!**

WHY?

- PLASTICS AND THEIR INCREASED USE IN SOCIETY
- BUILDING MATERIALS AND ALL HOUSEHOLD ITEMS
- ALL AROUND THE WORLD
- CHINA - MAIN PRODUCER AND SUPPLIER
- (International Agency for Research on Cancer and the US National Toxicology Program)

FIREFIGHTING AND CANCER

HOW DO WE DEAL WITH THIS ISSUE:

- IN NORTH AMERICA?
- IN AUSTRALIA?
- Europe?



SPEAKING AS A FIRE FIGHTER

WHO HAS SEEN HUNDREDS OF MY BROTHERS AND SISTERS SUCCUMB TO OCCUPATIONAL CANCER!



HISTORY

IGNORANCE IS BLISS!

1990'S

- USA AND CANADA HAD A LARGE NUMBER OF YOUNG FIRE FIGHTERS DYING OF CANCER
- ALL WERE PREVIOUSLY HEALTHY
- THEY HAD NO FAMILY HISTORY OF CANCER

EARLY SCIENCE

- AWKWARD BUT SHOWED A CONNECTION FIRE FIGHTERS IN METROPOLITAN TORONTO: SUMMARY OF THE MORTALITY STUDY, KRISTAN A. l'Abbe and George A. Tomlinson

April 24, 1992



2000

FIRE FIGHTERS WERE STILL DYING OF CANCER AT ALARMING RATES!

STUDIES START TO GET MORE SOPHISTICATED PRE 2002

- GUIDOTTI
 - REPORT TO THE WORKERS COMPENSATION BOARD OF MANITOBA BETWEEN SELECTED CANCERS AND THE OCCUPATION OF FIRE FIGHTER, 2002
- BARIS
 - COHORT MORTALITY STUDY OF PHILADELPHIA FIREFIGHTERS, 2001
- DEMERS
 - Nordic Fire Fighters

FIREFIGHTERS NOT GETTING SUPPORT

FINANCIALLY CHALLENGED

U.S.A.

- ORIGINAL LEGISLATION
- PRESUMPTIVE LEGISLATION
- PENSION
- HEALTH CARE BENEFITS
- NO CONSISTENCY IN SCOPE OR COVERAGE

MANITOBA, CANADA 2002

- THE FIRST LEGISLATION OF ITS KIND IN CANADA
(Bill 5, 3^{rs} Session, 37th Legislature, THE WORKERS COMPENSATION AMENDMENT ACT OF MANITOBA - Assented to May 23, 2002)
- FIRST CANADIAN JURISDICTION TO REGOGNIZE THE LINK BETWEEN OCCUPATIONAL CANCER & FIRE FIGHTING
- TREAT OCCUPATIONAL CANCER IN THE SAME WAY AS A DEATH OR INJURY ON THE FIRE GROUND
- CONSISTENT

PRIOR TO 2002

NOT A SINGLE FIRE FIGHTER HAD BEEN COVERED FOR OCCUPATIONAL CANCER

AUSTRALIA - 2011 LEGISLATION

AUSTRALIA



AUSTRALIA

- STUNNING SUCCESS
- Australian Senate Report



TODAY

90% OF FIRE FIGHTERS IN CANADA AND AUSTRALIA NOW HAVE COVERAGE

NOW THE CONNECTION BETWEEN CANCER AND FIREFIGHTING GETS WORLD-WIDE ATTENTION!

W.H.O. (World Health Organization)

IARC (International Agency for Research on Cancer)


THIS IS NOW A GLOBAL PHENOMENON

IARC

- FIRST TIME STUDYING
- CONNECTION TO PLASTICS
- LIST OF CARCINOGENS IN FIRES
- ▶ PUT FIREFIGHTING ON THE WORLD MAP
- ▶ FIRE FIGHTER CANCER AWARENESS
- ▶ CLASSIFYING - 2B


STUDIES

- LEMASTERS - OHIO, U.S.A.
- CANCER RISK AMONG FIREFIGHTERS: A REVIEW AND META-ANALYSIS OF 32 STUDIES
- 2006




STUDIES

- GUIDOTTI - MANITOBA, CANADA
- REPORT TO THE WORKERS COMPENSATION BOARD OF MANITOBA ON THE ASSOCIATION BETWEEN SELECTED CANCERS AND THE OCCUPATION OF FIREFIGHTER
- 2002




STUDIES

- KOREAN STUDY
- CANCER MORBIDITY OF PROFESSIONAL EMERGENCY RESPONDERS IN KOREA
- 2012



STUDIES

- NORDIC STUDY
- CANCER INCIDENCE AMONG NORDIC FIREFIGHTERS
- 2013




STUDIES

- MONASH UNIVERSITY STUDY
- FINAL REPORT ON AUSTRALIAN FIRE FIGHTERS' CANCER INCIDENCE STUDY
- LARGEST FIRE FIGHTER STUDY EVER DONE
- Hot off the Presses (January 2015)



NIOSH

- 30,000 Fire Fighters in Philadelphia, Chicago and San Francisco
- 2014



SCIENCE IS A BIG PUZZLE


EVERY STUDY IS A PIECE OF THAT PUZZLE!

RESULTS/FACTS

**FIREFIGHTERS DO HAVE HIGHER RATES OF CERTAIN CANCERS
WE GET CANCER AT A HIGHER RATE THAN THE GENERAL POPULATION
AND WE GET IT EARLIER IN LIFE**

RESULTS/FACTS

FIREFIGHTERS COME INTO CONTACT WITH DOZENS OF IARC CLASS 1, 2A AND 2B CHEMICALS AT EVERY FIRE



THE RESULTS ARE FRIGHTENING

FIRES ARE MORE DANGEROUS TODAY THAN EVER BEFORE DUE TO AN INCREASE IN THE USE OF PLASTICS



THE RESULTS ARE FRIGHTENING

COMPARED TO EVEN TEN YEARS AGO:

- THE USE OF PLASTICS IS INCREASING
- BUILDING MATERIALS
- ELECTRONICS
- FLAME RETARDANTS
- NEW CHEMICAL COMBINATIONS

THE RESULTS ARE FRIGHTENING

**PLASTICS AND FIRE RETARDANTS
HBO SPECIAL - "TOXIC HOT SEAT"**

<https://www.youtube.com/watch?v=2e-LK80LhUY>

THE RESULTS ARE FRIGHTENING

**THE LONGER YOU WORK AS A FIRE FIGHTER
THE MORE YOUR CANCER RISK INCREASES**

THE RESULTS ARE FRIGHTENING
CHEMICALS COMBINE TO INCREASE EXPOSURE TO CANCER-CAUSING CARCINOGENS

In toxicology, synergism refers to the effect caused when exposure to two or more chemicals results in health effects that are greater than the sum of the effects of the individual chemicals.

$1 + 1 = 4$

CANADIAN CENTRE FOR OCCUPATIONAL HEALTH AND SAFETY

THE RESULTS ARE FRIGHTENING

WE CANNOT PROTECT OURSELVES FROM THIS DANGER


FIREFIGHTING CLOTHING PROTECTS US FROM AMBIANT HEAT BUT NOT FROM CONTACT WITH CANCER CAUSING CHEMICALS

PARTICULATE INFILTRATION SUTUDY - 2015

PARTICULATE:

INFILTRATION STUDY:

- IAFF
- Research Triangle Institute
- Game Changer!



PATICULATE INFILTRATION STUDY

- Tests were done as per Department of Defence
- Florescent Aerosol Screening Test

PARTICULATE INFILTRATE STUDY

SUBJECTS WERE:

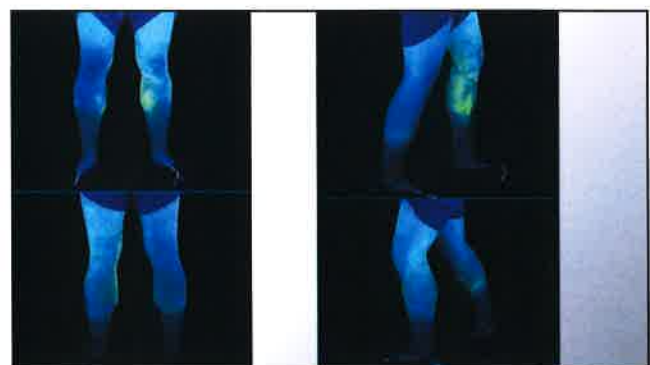
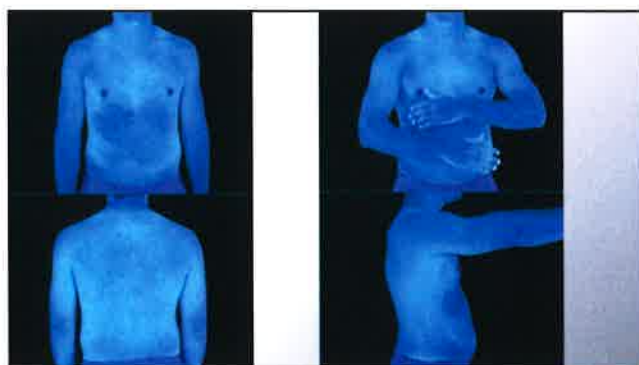
- SCBA and turnout gear in a particle laden chamber
- Silica Powder - same infiltration as cancer causing carcinogens.

PARTICULATE INFILTRATION STUDY

- Subject Performed basic Firefighter Movements in controlled Enviroments
- Subject them went under sensitive Black Lights to expose Particulate infiltrations in gear

PARTICULATE INFILTRATION STUDY

- Particles were seen throughout inside of the Gear
- Particles were high in concentrations around the face, neck, Crotch and coat interface areas.



PARTICULATE INFILTRATION STUDY

Conclusively shows pathways for carcinogens



STUDY:

- Conclusively shows that as fire fighters we can not protect ourselves.
- Need for hygiene, clothing turn our maintained and cleaning after each fire.
- The bodies ability to absorb carcinogens increases expediently when skin temperature increases during a fire

Study:

- As Skin temperature rises so does the Permeability of the skin.
- The Strongest in the Neck, Jaw, Face and Crotch
(2-4 degrees of Skin temperature = 200-400 times more Permeable)

THE RESULTS ARE UNDERESTIMATED

HEALTHY WORKER EFFECT

PRESUMPTIVE LEGISLATION

- OUR LEGAL ABILITY TO SUPPORT OUR FELLOW FIRE FIGHTERS
- TREAT CANCER DEATHS AS LINE OF DUTY DEATHS

PRESUMPTIVE LEGISLATION

NOT A NEW IDEA

PERCIVAL POTT



FIRST TO IDENTIFY A CONNECTION BETWEEN SOOT AND CANCER

PERCIVAL POTT



CHILDREN WORKED AS CHIMNEY SWEEPS IN THE 1700'S

PERCIVAL POTT

HIS WORK RESULTED IN THE CHIMNEY SWEEPER ACT OF 1786

FIRE FIGHTERS ARE PRESENT DAY CHIMNEY SWEEPS



PRESUMPTIVE LEGISLATION

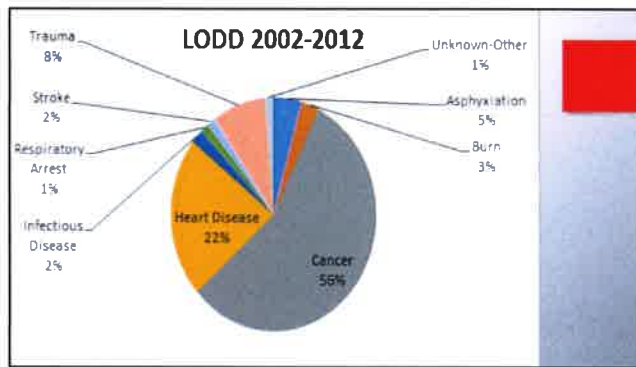
REVERSES LEGAL ONUS ONTO THE EMPLOYER TO PROVE THAT THE CANCER IS NOT CONNECTED TO FIREFIGHTING

DOES FIREFIGHTING CAUSE CANCER?

Recent epidemiological studies and meta-analyses have documented increased risk for several site-specific cancers in fire fighters.

In 2007, the International Agency for Research on Cancer (IARC) classified firefighting as possibly carcinogenic to humans (Group 2B)

In 2015, IARC considering upgrade of classification to probably carcinogenic to humans (Group 2A)



“Young fire fighters are developing far more aggressive types of cancers, such as brain cancers, at an earlier age than the general population.



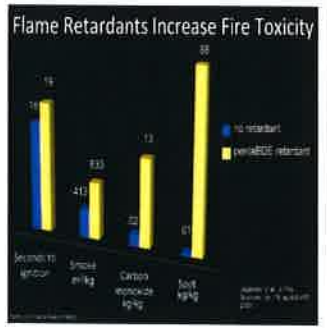
New Chemical Hazards in Today’s Fire Environment

Halogenated flame retardants, per and poly fluorinated alkyl substances in household materials

Foam furniture, carpets, mattresses, plastics, TVs, computers, electronics building insulation



“Because of the **multiple exposures** And the **multiple routes** of exposure—they inhale carcinogen and absorb Them through the skin—it is also highly Unlikely for firefighters to get only one Type of cancer.”
 —LeMasters et al. (2006)



Routes of Exposure


- Inhalation
- Ingestion
- Skin Absorption



Heat Increases Skin Absorption

“Skin’s permeability increases with temperature and for every 5 degree increase in skin temperature, absorption increases 400%”

(Romonchuk and Bunge 2004; Danaon et al. 1986)




Extended Exposure (Inhalation and Dermal) from Contaminated PPE

Contaminated Hoods After One Fire

“Bunker gear can go unwashed for months at a time, even after significant fires.”

Inhalation (off-gassing) And transdermal exposure during and after fires



Smoke and soot on gloves 100X higher than hoods.

We're next to most permeable skin area - jaw, forehead, scalp
Cleaning infrequent after fire suppression

PRESUMPTIVE LEGISLATION

ACTS AS A GREAT EDUCATOR

PRESUMPTIVE LEGISLATION

ALLOWS US TO CREATE A PROTOCOL TO MINIMIZE OUR CANCER RISKS WHERE WE CAN

CONCLUSION

- ANEDOTAL MEDICAL INFORMATION FROM DOCTORS AROUND THE WORLD

CONCLUSION

- OUR WORKPLACE IS KILLING US
- WE HAVE NO WAY TO FULLY PROTECT OURSELVES
- THE SITUATION IS GETTING WORSE

CONCLUSION

**GOVERNMENTS AND POLITICIANS
NEED TO ADMIT THERE IS A
PROBLEM**

**THIS PRESENTATION IS
BEING DONE IN MEMORY OF
THE MANY FIRE FIGHTERS
WHO HAVE DIED OF
OCCUPATIONAL CANCER WITH
NO SUPPORT OR
ACKNOWLEDGMENT
FROM THEIR
POLITICAL LEADERS**