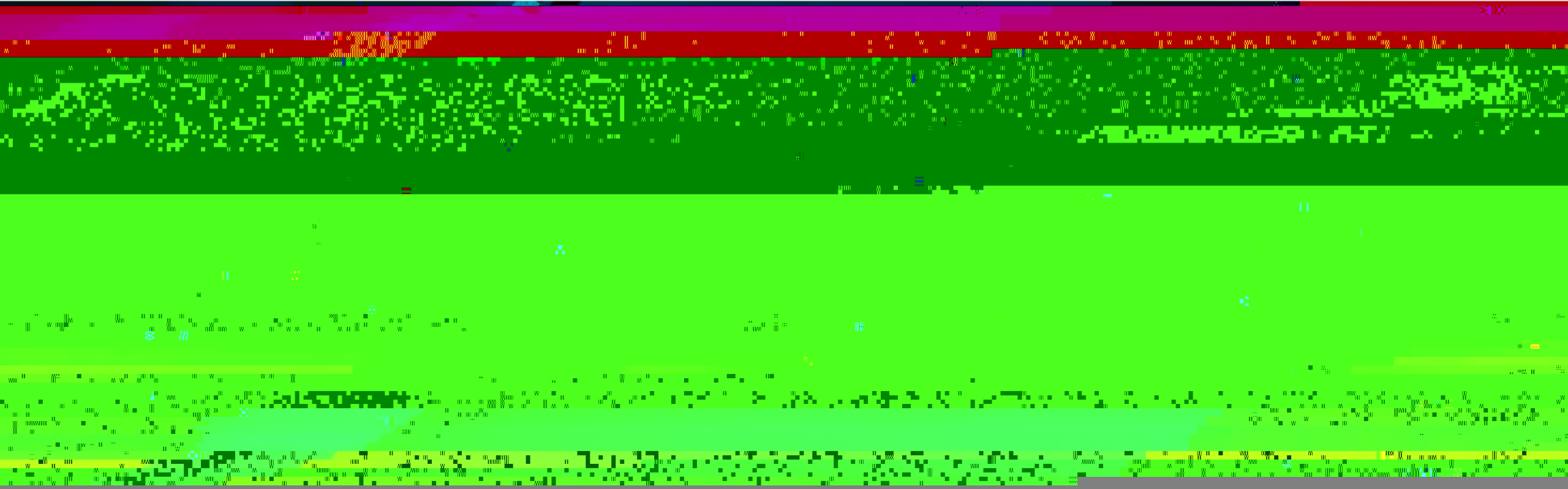


Measuring Particulate Matter



FIREFIGHTERS' INSIDE-CITY MONITORING



Washington, DC



CSMP TEK



Occupational Exposure to Fireground Chemicals

The number of firefighters who have died from cancer, or are battling this disease, is alarming

IAFF LODD database - 864 members between 2005-15

Mounting epidemiological



FIREFIGHTERS' HEALTH AND SAFETY MONITORING

FIREFIGHTER PHYSIOLOGICAL MONITORING



Washington, DC



Fire Dept



CSMP/TEK



Fire Research



NIOSH

Current Understanding of Exposure Pathways During F



Chemicals of Concern

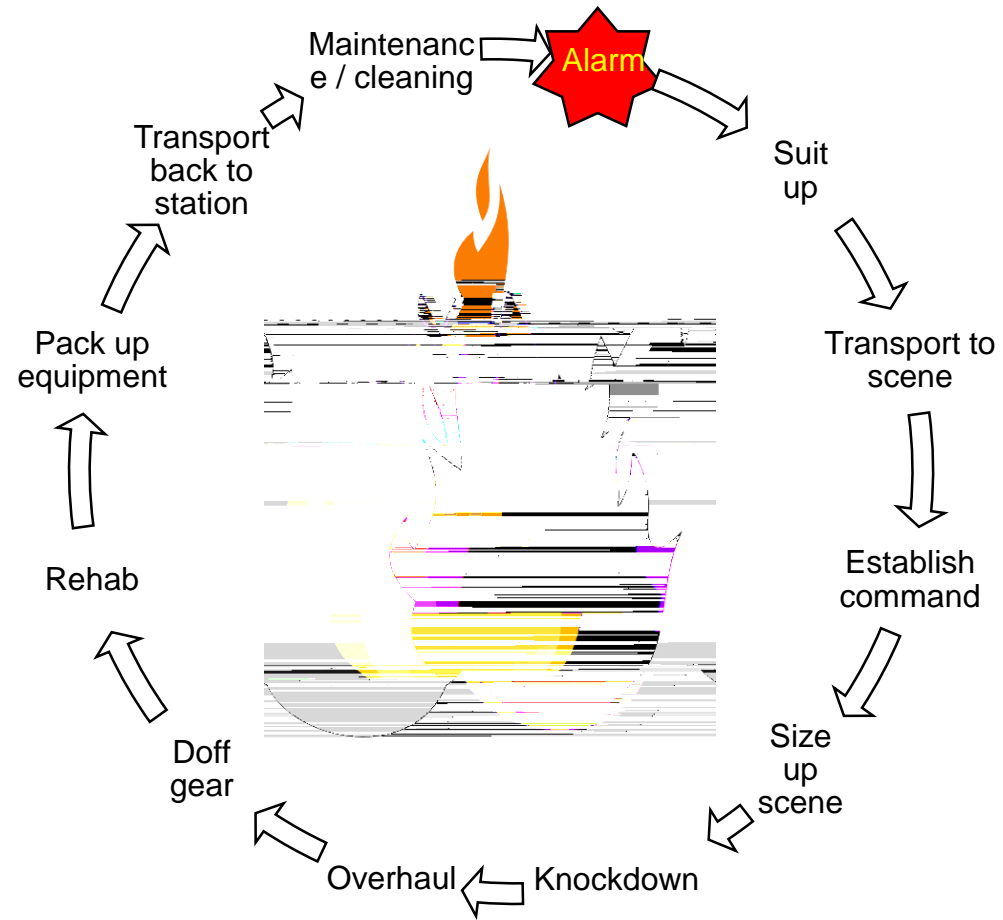
May be produced when organic materials are burned

May be produced when synthetic materials are burned

CHEMICAL CLASS	POTENTIAL HEALTH EFFECTS
Polycyclic aromatic hydrocarbons (PAHs)	Carcinogenic (benzo[a]pyrene)
Volatile organic compounds (VOCs)	Carcinogenic (benzene, 1,3-butadiene), central nervous system effects
Aldehydes	Carcinogenic (formaldehyde), respiratory sensitizer (formaldehyde), pulmonary edema (acrolein)
Acid gases	Respiratory irritation, pulmonary edema, chemical asphyxiation (HCN)
Phthalates	Endocrine disruption, liver tumors in animals (DEHP)
Polybrominated diphenyl ethers (PBDEs)	Accumulates in the body, thyroid, liver, immune system effects, neurodevelopmental effects, liver tumors in animals (deca-BDE)
Dioxins and furans	Accumulates in the body, similar health effects as PBDEs, carcinogenic (TCDD)
Organophosphate flame retardants (OPFRs)	Neurotoxicity, cytotoxicity
Diesel exhaust	Carcinogenic



Potential for Chemical Contact



Routes of Absorption

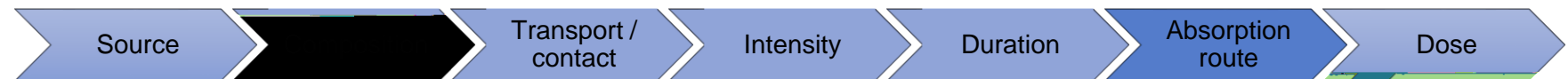
Inhalation

Exterior operations/overhaul without respiratory protection
Off-gassing contamination on turnout gear

Dermal

Permeation/penetration of contaminants
Direct uptake of gases/vapors
Cross-transfer of contamination from gear/equipment

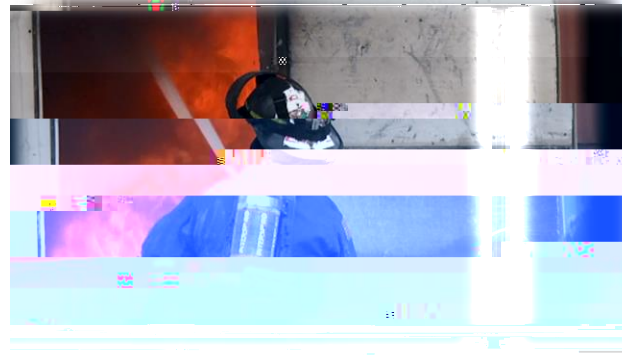
Ingestion



Cardiovascular & Chemical Exposure



Denise Smith, Gavin Horn, Steve Kerber, Kenny Fent



<https://vimeo.com/153244392>

FIREFIGHTERS' PHYSIOLOGICAL MONITORING

Washington, DC

STIVERS

SEARCH

CSMP TEK

PROFESSOR





Cancer Risks

Firefighters are at higher risk for many cancers

Pulmonary Risks

Inflammation/Oxidative stress
Decreased lung function
Asthma/COPD
Increased respiratory symptoms

Cardiovascular Risks

Increased risk of dysrhythmia
Increased myocardial ischemia