GETTING THE RIGHT CARE: EDUCATING YOUR PCP

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Former Firefighter and Medical Examiner
Boston Fire Department
AGENDA

• Understand that many job related injuries, cancer, heart disease, and behavioral health issues are preventable

• Become stronger advocates to obtain the necessary early detection screenings from your PCP

• Encourage the practice of better self-care

• Promote new culture of Health, Safety, and Fitness for your departments and the Mindset: “Firefighters=Tactical Athletes”
Unacceptable health declines in firefighters

- From optimal health and fitness:
  - Top PAT performance
  - Passing entrance physical
  - Psyche and drug testing clearance
  - Graduating from fire academy

- To significant health deteriorations:
  - Cancer
  - Heart disease
  - Troubling behavioral health conditions
  - Cumulative injuries
  - Early deaths
Firefighter Cancer-Troubling Stats

- 14% higher risk of dying from than U.S. adult population

- BFD even higher:
  - New cancer case every 3 weeks
  - 20 Boston firefighters last year
  - 3 recent deaths from
  - Several more with advanced disease:
Fireground and Firehouse are Carcinogenic

- Combustion of flame retardants
- Smoldering plastics and synthetics
- Diesel exhaust fumes and particles
- Overnight shifts
- Excess weight and obesity
- Cumulative stresses
Cancer mechanism

- Inhalation, ingestion, absorption of toxins through lungs, mouth, and skin

- Carcinogens → bloodstream → to organs → mutations and abnormal cell growth → cancer develops several years later

- 3 days after a fire can still smell traces of smoke from firefighters body
High Risk Cancers: Think about routes of exposure and elimination

- Respiratory system
- Gastrointestinal system
- Genitourinary system
- Skin
- Blood
Overweight and obesity increase risk for:

- Esophageal Cancer
- Liver Cancer
- Kidney Cancer
- Colorectal Cancer
- Advanced Prostate Cancer
- Post-menopausal Breast Cancer
- Gallbladder Cancer
- Pancreatic Cancer
- Ovarian Cancer
- Endometrial Cancer
Preventing Cancer in the Fire Service

- **Strong Leadership:**
  - Dedicated command division (BFD-Safety, Health and Wellness Division)
  - Ongoing in-service training drills

- **Better self-care:**
  - On the fire ground
  - In the firehouse
  - In your own home
Fire ground operations

• “Every building fire = Hazmat incident”

• Consistent use of SCBA and hoods. (Instructors and Arson investigators also)

• Wet naps after exiting

• Quick field decon of debris from bunker gear

• 45 Minute Air Bottles
Firehouse Operations

- “Shower within an hour”
- Wash hoods, gloves, helmet liner after every fire
- Full compliance with diesel exhaust vents
- Industrial washers for bunker gear
- Vigorous workout within 24 hours post fire
- Better sleep hygiene

- Healthy nutrition and regular exercise
- Get back to your “fighting weight”
- Stay well hydrated:
  - Drink at least one-half of your weight in ounces of water a day
  - Helps lessen your chances for developing colon and bladder cancer
A More Proactive Mindset Needed in the Fire Service

- Better self-care and being more proactive with screenings

- Approach the annual exam as a very “high-risk” patient and consumer

- Promote the expectation that this exam will help detect early and prevent these high-risk occupational diseases

- Be a fierce advocate to obtain these necessary tests from your PCP
THE FIREFIGHTER PRE-PHYSICAL (PREP) GUIDE FOR PREVENTION AND EARLY DETECTION OF OCCUPATIONAL CANCERS

Dear Firefighter,

In addition to the elevated risk for cardiovascular disease, well-researched government and university studies demonstrate that your occupation also poses you significant risk for developing respiratory, gastrointestinal, genitourinary, skin cancers and more. The Firefighter Pre-Physical (PREP) Guide is designed to better prepare you to obtain the necessary comprehensive screening tests from your primary care clinicians to help prevent and detect early these high-risk occupational diseases.

Your primary care clinicians may not be fully aware of your unique occupational health risks and your health insurance plan may not automatically cover additional screening tests especially for younger firefighters. As a “high-risk” consumer of health care, you can overcome these issues by utilizing the PREP Guide along with the Firefighter Comprehensive Physical Exam (CPF) template for your primary care provider. This will help in initiate a stronger partnership with your PCP and more effectively advocate for the comprehensive screenings you deserve.

The PREP Guide will help you recall and document any concerning signs and symptoms that may indicate the presence of a particular high-risk occupational cancer. This list, along with a thorough review of your job-related exposure, should be discussed and shared with your primary care physician during the Review of Systems (ROS) questioning portion of the annual exam. The inquiry should justify and facilitate more aggressive workups.

### The Firefighter Pre-Physical (PREP) Guide

#### Cancer Type

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Signs and Symptoms</th>
<th>Workup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td></td>
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<tr>
<td>Respiratory</td>
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<tr>
<td>Blood</td>
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#### Incidents

<table>
<thead>
<tr>
<th>Incident</th>
<th>Care Indications</th>
<th>Workup</th>
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<tbody>
<tr>
<td>Firefight</td>
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</table>

Fortunately, you can significantly help minimize your high risk by developing preventive health habits and practices. This includes adhering to all cancer safety measures on the job and at home, eating healthy, exercising regularly, avoiding smoking, limiting alcohol consumption, and using sunscreen. Additionally, completing the PREP Guide before serving on your annual exam and along with your CPF template is of utmost importance.

Sincerely,

Michael O. Hannam, MD

(Dr. Hannam is a former firefighter and department physician for the Boston Fire Department and provides primary care to many Massachusetts firefighters at Massachusetts General Hospital.)
Firefighter Pre-Physical (PREP) Guide

• Helps raise awareness of early signs and symptoms of high-risk occupational cancers:
  ➢ Respiratory, gastrointestinal, genitourinary, skin and blood cancers

• Encourages a more proactive mindset to advocate for your necessary screening tests:
  ➢ PCP may not be fully aware of your unique risks
  ➢ Health plan may not “automatically” cover
<table>
<thead>
<tr>
<th>CANCER TYPE</th>
<th>SIGNS AND SYMPTOMS</th>
<th>WORKUP</th>
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</table>
| SKIN        | “ABCDE” Skin Lesion Criteria:  
- Asymmetry  
- Border irregularities  
- Color variation (within the same region)  
- Diameter 6mm or >  
- Enlargement or change in shape, color or symptoms | May require Dermatology Referral |
| RESPIRATORY SYSTEM: Throat, airways and lung |  
- Chronic cough and sputum  
- Dyspnea (shortness of breath)  
- Chest pain  
- Weight loss  
- Hemoptysis (coughing up blood)  
- Hoarseness or chronic pharyngitis | May require Chest CT scan and ENT or Pulmonary consult |
<table>
<thead>
<tr>
<th>BLOOD: Leukemia, lymphoma and multiple myeloma</th>
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<tbody>
<tr>
<td>o  Bleeding</td>
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<tr>
<td>o  Fatigue</td>
</tr>
<tr>
<td>o  Easy bruising</td>
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</tr>
<tr>
<td>o  Itching</td>
</tr>
<tr>
<td>o  Large nodes</td>
</tr>
<tr>
<td>o  Bone pain</td>
</tr>
<tr>
<td>o  Chronic infections</td>
</tr>
<tr>
<td>o  Poor wound healing</td>
</tr>
<tr>
<td>o  Brittle nails</td>
</tr>
<tr>
<td>Complete Labs sets and hematology referral may be required</td>
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**Note:**
- Bleeding
- Fatigue
- Easy bruising
- Pale color
- Dyspnea
- Fever or Night Sweats
- Weight loss
- Itching
- Large nodes
- Bone pain
- Chronic infections
- Poor wound healing
- Brittle nails
- Complete Labs sets and hematology referral may be required
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</thead>
<tbody>
<tr>
<td><strong>GASTRO INTESTINAL SYSTEM: Mouth, liver, esophagus, colon and pancreas</strong></td>
<td>- Bloody or dark stools</td>
<td>- Vomiting</td>
<td>GI referral, Colonoscopy, and Imaging studies may be required</td>
</tr>
<tr>
<td></td>
<td>- Abdominal pain</td>
<td>- Fatigue</td>
<td></td>
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<td></td>
<td>- Change in bowel habits (pencil thin or loose stools or constipation)</td>
<td>- Pain or difficulty with swallowing</td>
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<tr>
<td></td>
<td></td>
<td>- Jaundice</td>
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<tr>
<td></td>
<td></td>
<td>- Early satiety</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>- Weight loss</td>
<td></td>
</tr>
<tr>
<td><strong>GENITO- URINARY: Kidneys, bladder, prostate, testicles and uterine and ovarian for females</strong></td>
<td>- Hematuria (blood in urine)</td>
<td>Females:</td>
<td>May need Urinalysis, biomarkers, PSA testing, Cystoscopy, Imaging, Urology referral, Gyn referral</td>
</tr>
<tr>
<td></td>
<td>- Urinary frequency, urgency or slow stream</td>
<td>- Pelvic pain or bloating</td>
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<tr>
<td></td>
<td>- Abdominal mass/pain</td>
<td>- Abnormal gyn bleeding</td>
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<td></td>
<td>- Painless testicle mass</td>
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<tr>
<td>INCIDENTS</td>
<td>CARCINOGENIC EXPOSURES</td>
<td>WORKUP</td>
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| HOME and AUTO FIRES | o Polycyclic aromatic hydrocarbons (PAHs) and formaldehyde from smoldering plastics and synthetics  
  o Brominated dioxins and furans from flame retardants | See: Firefighter Comprehensive Physical Exam (CPE) Template |
| FIREHOUSE | o Aldehydes and PAHs including benzene from diesel exhaust |
Comprehensive Firefighter Physical Exam Template

• Educates PCP on your unique health risks
• Designed for earlier detection of high risk cancers from your PCP
• Screenings for: oral, lung, colon, kidney, prostate, bladder, testicular, breast, gyn, blood and skin cancers
• Many have returned to work after early diagnosis and successful treatments
• Regular dental exams
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<th>Annual Labs and Screening Tests</th>
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<td>Weight and body fat index</td>
<td>Complete blood count</td>
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<td>Thorough skin exam</td>
<td>Thyroid panel</td>
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<tr>
<td>Vascular and neurological exams</td>
<td>Colonoscopy (begin age 40 and every 5 years)</td>
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<tr>
<td>Mental status exam</td>
<td>Exercise stress echo (begin age 40 and every 3 years)</td>
</tr>
<tr>
<td>Musculoskeletal exam</td>
<td>Mammograms for females (begin age 35)</td>
</tr>
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Case Study #1

- 49 y/o female, 20 years on job, woke up at 2:00 AM at home with chest pain, SOB and sweating
- 2 days prior performed engine company duties at residential fire
- EMS transported to ER and sent for emergent cath. and stent placed LAD vessel
- During admission was diagnosed with Type 2 diabetes and hyperlipidemia
Case Study #1

• Pertinent history:
  - Hypertension: Not fully compliant with meds, “Borderline cholesterol”
  - Not seen PCP > 1 year
  - Single parent
  - Helping care for elderly parents
  - Drinking “2 to 3” glasses of wine a night
  - Gained 25 pounds since drill school
  - Difficulty sleeping since at tragic incident 6 months ago.
Lessons Learned

• Hypertension: Poor med compliance
• Elevated cholesterol
• Lack of follow up with PCP
• Alcohol self medicating
• Weight gain
• Poor sleep/stress
• Type 2 diabetes
• Cardiac strain can persist > 48 hours post fire
Coronary Artery Disease (CAD)

• Risk factors:
  ➢ Hypertension
  ➢ Obesity/Sedentary Lifestyle
  ➢ Hyperlipidemia
  ➢ Diabetes
  ➢ Family History
  ➢ Smoking
  ➢ Metabolic Syndrome

• Cascade of inflammation:
  ➢ Injury
  ➢ Inflammation
  ➢ Plaque buildup
  ➢ Blockages
  ➢ Acute Coronary event
  ➢ Death
Coronary artery (supplies blood and oxygen to heart muscle)

Heart muscle

Coronary artery

Blocked blood flow

Plaque buildup in artery

Healthy heart muscle

Blood clot blocks artery

Dead heart muscle
Heart disease in firefighters

- Stresses:
  - Physical: Extreme cardiovascular demands
  - Mental: “Fight-or-Flight” hormones
  - Chemical: CO and HCN

- Inadequate fitness levels to meet vigorous demands

- Not immune to traditional CAD risk factors
Troubling Stats of Heart Disease Risks

- Higher rates of acute coronary events than residents you serve.

- 60% of firefighters have hypertension vs. 30% of adult U.S. population

- U.S. pop.: 30% obesity, Professional Firefighters: 30-40%, Volunteer FF’s: 45% obese.

- Less than half of firefighters obtain annual physical exams:
Sedentary Lifestyle and Obesity

• Too many gain up to 20 lbs. after their first year

• Equivalent to carrying a half hour air bottle for the rest of your life!

• Typical firehouse meal → Thanksgiving dinner → 3500 calories which is exactly 1 lb.

• More calories are consumed by raiding the fridge when returning from fire calls after midnight.
Firefighter Cardiac Event (Summary)

- Extreme physical demands on fireground
- Exposure to CO and HCN
- Ongoing mental stress response from family issues and traumatic experiences
- Underlying cardiac risk factors: HTN, weight gain, Diabetes, high cholesterol:
  - All precipitated a coronary plaque to rupture 48 hours later from cardiovascular strain.
Prevention Strategies to Prepare Firefighters to Better Deal with the Stresses of the Job

- Comprehensive evaluations for early detection and prevention of heart disease risk factors

- “Tactical Athlete” Train the Trainer Injury and Heart Disease Prevention Program
FIREFIGHTERS ARE ATHLETES

• Perform **physically challenging** work in very difficult environments.

• **Cardiovascular demands** on the fire ground often exceed those on the athletic field or arena.

• Must be as prepared **physically and mentally** to fight fires as athletes are to excel in their sports.

• Must maintain **high fitness** levels into their 60’s while most athletes retire in their mid 30’s.
BFD-02X Human Performance Train the Trainer Program

- 4 day workshop (intense but fun)
- Conditioning Program with functional workouts specific to firefighter skill sets
- Optimizes Mental and Physical Performance (Sleep hygiene and Suicide prevention)
- Nutrition and Lifestyle changes
- Injury Prevention and Pre-Rehabilitation Techniques (Prehab)
Heart disease risk factor mitigation strategies

- Smoking cessation
- ETOH moderation
- SCBA compliance

- Maintain “fighting weight”:
  - Healthy Nutrition
  - Regular exercise

- Hydration
- On scene rehab
- Avoid denial of symptoms
- Stress reduction
- Annual comprehensive physical and screenings
Annual Firefighter Physical

- A comprehensive and confidential exam with emphasis on primary prevention of heart disease

- An aggressive follow up plan with PCP to assure blood pressure, cholesterol, blood sugar, weight, and fitness goals are reached.

- Starting at age 40: Exercise stress echo test every 3 years
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Exercise Stress Echo (ESE) every 3 years for >40 y/o:

1. Much better than ETT in diagnosing ischemia

2. Helpful test for diagnosing Left Ventricular Hypertrophy (LVH), a major risk factor for firefighter cardiovascular events

3. Very effective test to reassure and motivate the “aging” firefighter that you can continue vigorous workouts
Hypertension

• Normal Range: <120/80

• Prehypertension: 120-139/80-89

• Hypertension Stage 1: 140-159/90-99

• Hypertension Stage 2: >160/>100

• Approx. 30 % U.S. adults have HTN while 60% firefighters have HTN.
Behavioral Health Issues in Firefighters

• Firefighter BH issues cause more morbidity and mortality than heart or cancer cases

- Anxiety, depression, sleep disorders, PTSD (5 X risk)
- Self medicating with alcohol, drugs or food
- 2 times # of Suicides than LODD’s
- Many FF Suicides go unreported (Estimate 257 last year)
- Significant toll on family members:
Substance Abuse

- Firefighting attracts risk takers
- Self med behaviors to “cope” with witnessing human trauma, sufferings, and deaths
- Exacerbation of PTSD symptoms from prior military service
- “Firefighter lifestyle” with many activities centered around alcohol
- Enabling behavior by coworkers and officers
- Prescribed pain meds for job related injuries
BFD Behavioral Health and Substance Abuse Prevention

- Ongoing resiliency training classes
- BFD-O2X Behavioral Health Program
- Fire College Training
- Peer Support Trainers
- CISM and on-call counselors
- EAP Support
- Random urine toxicology testing
- BFD-MGH Pilot Study
Physical Exam Behavioral Health Screenings with PCP

• Anxiety and depression
• Acute stress reactions and PTSD
• Sleep disorders
• Smoking
• Self-medicating behaviors with alcohol and drugs
• Suicidal ideations
Early Detection Pilot Study

▪ Screen Boston firefighters for early detection of high risk job related cancers and cardiovascular diseases at St. Elizabeth’s Medical Center

▪ Thoroughly review all screening results with individual firefighter and primary care providers

▪ Recommend necessary intervention and prevention steps including:
  - Lifestyle changes
  - Further evaluations with PCP and specialists
  - Cardiac catheterizations and interventions
Findings (ages 43-64)

- **Carotid Ultrasounds:** 14/103 (13.6%) positive for carotid artery stenosis at (40-59% narrowing)

- **Abdominal Aorta Ultrasounds:** 10/103 (9.7%) abdominal aortic aneurysms (> 3.1 cm)

- **Chest CT (w/o contrast):** 33/103 (32%) Pulmonary nodules (2-8mm)

- **CT Heart (Coronary Calcium Scores):** 70/103 (68%) scores > 0, (1-2000)
Other significant and concerning findings

- Ascending aortic aneurysms: 6 cases
- Hepatic nodules: 3 cases
- Pulmonary artery Hypertension: 4 cases
- Bronchitis/COPD: 13 cases
- Esophageal thickening (concern for mass): 3 cases
- Atrial fib: 1 case
- Large thyroid goiter compressing trachea: 1 case
- Severe celiac artery/SMA stenosis: 1 case
- Vertebral artery occlusion: 1 case
- Mediastinal mass: 1 case
Recommendations

- Screen all with 15+ years of service
- Negotiate with insurance providers to cover
- Strongly encourage annual Comprehensive Firefighter Physical Exam
- Initiate Health, Safety, and Wellness Divisions
- Promote the new mindset that firefighters are “Tactical Athletes”

All felt scans were significant motivating factors for better self-care and lifestyle changes
Lessons Learned

- Promoting a culture of Health, Safety and Fitness can help prevent many firefighter injuries and illnesses.

- Be a fierce advocate to obtain the necessary screenings from your PCP.

- Practicing better self care will optimize job performance and longevity into retirement years.

- Annual exams and screening tests are imperative for early detection and prevention of occupational cancer and heart disease.
References and Bibliography

• [www.cdc.gov/niosh/blog/nsb110107_fire.html](http://www.cdc.gov/niosh/blog/nsb110107_fire.html) Preventing firefighter fatalities.
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• [www.iaff.org](http://www.iaff.org) IAFF-IAFC Joint Wellness Fitness Initiative.
• [www.firehero.org](http://www.firehero.org) NFFF “Everyone Goes Home” Program
• [www.fcsn.net](http://www.fcsn.net) Firefighter Cancer Support Network. White Paper on Firefighter Cancer Awareness
• [www.cityofboston.gov/fire](http://www.cityofboston.gov/fire)

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