

GETTING THE RIGHT CARE: EDUCATING YOUR PCP

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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

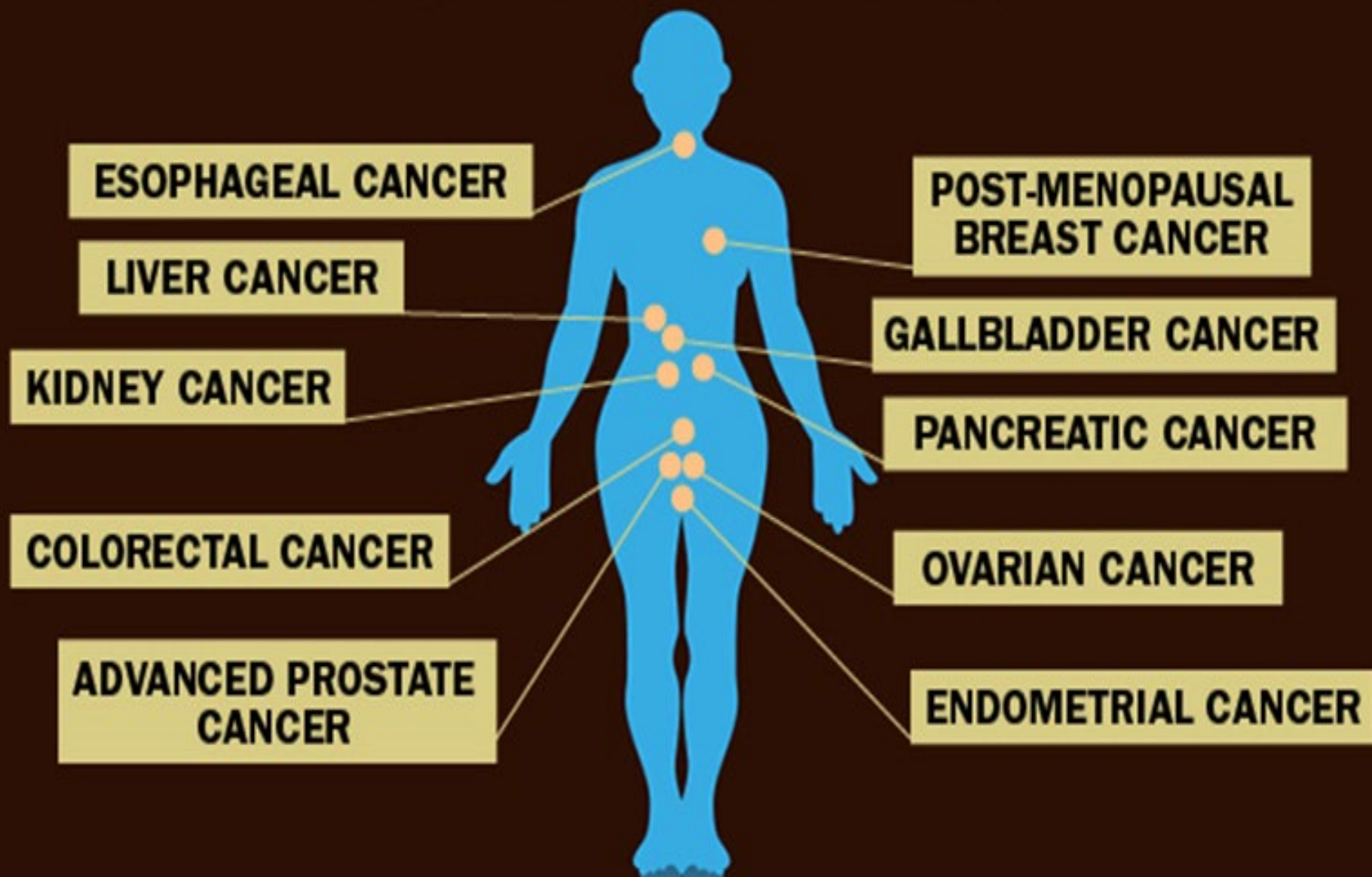
Cancer mechanism

- 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



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 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

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Dear Firefighter:

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

Your primary care clinician 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 challenges by utilizing the PREP Guide along with the Firefighter Comprehensive Physical Exam (CPE) template for your primary care provider. This will help to foster a stronger partnership with your PCP and more effectively advocate for the comprehensive screenings you deserve.

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

FIREFIGHTER PRE-PHYSICAL (PREP) GUIDE

CANCER TYPE	SIGNS AND SYMPTOMS				WORKUP
SKIN	"ABCDE" Skin Lesion Criteria <ul style="list-style-type: none">AsymmetryBorder irregularitiesColor variation (within the same lesion)		<ul style="list-style-type: none">Discoloration (tan or >)Enlargement or change in shape, color or symptoms		May require Dermatology Referral
RESPIRATORY SYSTEM: Throat, sinuses and lung	<ul style="list-style-type: none">Chronic cough and sputumCyanosis/blueness of limbsChest pain		<ul style="list-style-type: none">Weight lossHemoptysis (coughing up blood)Hoarseness or chronic pharyngitis		May require Chest CT scan and ENT or Pulmonary consult
BLOOD: Leukemia, lymphoma and multiple myeloma	<ul style="list-style-type: none">BleedingFatigueFeverItchingNauseaSweats	<ul style="list-style-type: none">Fever or Night SweatsWeight lossItchingLarge nodesBone pain	<ul style="list-style-type: none">Chronic infectionsPoor wound healingBleeding nodes	Complete Lab tests and Hematology referral may be required	

CANCER TYPE	SIGNS and SYMPTOMS	SIGNS and SYMPTOMS	WORKUP
GASTRO-INTESTINAL SYSTEM: Mouth, liver, esophagus, colon and pancreas	<ul style="list-style-type: none"> Bloody or dark stools Abdominal pain Change in bowel habits (stool thin or loose, stools or constipation) 	<ul style="list-style-type: none"> Vomiting Fatigue Pain or difficulty with swallowing Jaundice Early satiety Weight loss 	GI referral, Colonoscopy, and Imaging studies may be required
GENITO-URINARY: Kidneys, bladder, prostate, testicles and uterus and ovaries for females	<ul style="list-style-type: none"> Hematuria (blood in urine) Urinary frequency, urgency or slow stream Abdominal cramps/pain Painful urinate more 	<ul style="list-style-type: none"> Painful Pelvic pain or bleeding Abnormal gyn bleeding 	May need Urinalysis, biomarkers, PSA testing, Cystoscopy, Imaging, Urology referral, Gyn referral

INCIDENTS	CARCINOGENIC EXPOSURES	WORKUP
HOUSE and AUTO FIRES	<ul style="list-style-type: none"> Polycyclic aromatic hydrocarbons (PAHs) and benzothiole from smoldering plastics and synthesis Brominated dioxins and furans from flame retardants 	See Firefighter Comprehensive Physical Exam (CPE) Template
FIREHOUSE	<ul style="list-style-type: none"> PAHs, Nitrogen dioxide and/or the dioxins from diesel exhaust 	

Fortunately, you can significantly help minimize your high risk for developing occupational cancer by being more proactive and practicing better self care. This includes adhering to all cancer safety measures on the fire ground and in the firehouse, eating healthy, exercising regularly, avoiding smoking, limiting alcohol consumption, and using sun block. Additionally, completing the PREP Guide before arriving for your annual exam along with your CPE template is of utmost importance.

Sincerely,

Michael G. Harnack, MD

(Dr. Harnack is a former firefighter and department physician for the Boston Fire Department and provides primary care to many Massachusetts firefighters at Steward J. Ellender's Medical Center in Boston, MA.)

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

CANCER TYPE	SIGNS AND SYMPTOMS		WORKUP
SKIN	<p>“ABCDE” Skin Lesion Criteria:</p> <ul style="list-style-type: none"> ○ Asymmetry ○ Border irregularities ○ Color variation (within the same region) 	<ul style="list-style-type: none"> ○ Diameter 6mm or > ○ Enlargement or change in shape, color or symptoms 	May require Dermatology Referral
RESPIRATORY SYSTEM: Throat, airways and lung	<ul style="list-style-type: none"> ○ Chronic cough and sputum ○ Dyspnea(shortness of breath) ○ Chest pain 	<ul style="list-style-type: none"> ○ Weight loss ○ Hemoptysis(coughing up blood) ○ Hoarseness or chronic pharyngitis 	May require Chest CT scan and ENT or Pulmonary consult

CANCER TYPE	SIGNS and SYMPTOMS	SIGNS and SYMPTOMS	WORKUP
GASTRO INTESTINAL SYSTEM: Mouth, liver, esophagus, colon and pancreas	<ul style="list-style-type: none"> ○ Bloody or dark stools ○ Abdominal pain ○ Change in bowel habits (pencil thin or loose stools or constipation) 	<ul style="list-style-type: none"> ○ Vomiting ○ Fatigue ○ Pain or difficulty with swallowing ○ Jaundice ○ Early satiety ○ Weight loss 	GI referral, Colonoscopy, and Imaging studies may be required
GENITO- URINARY: Kidneys, bladder, prostate, testicles and uterine and ovarian for females	<ul style="list-style-type: none"> ○ Hematuria (blood in urine) ○ Urinary frequency, urgency or slow stream ○ Abdominal mass/pain ○ Painless testicle mass 	Females: <ul style="list-style-type: none"> ○ Pelvic pain or bloating ○ Abnormal gyn bleeding 	May need Urinalysis, biomarkers, PSA testing, Cystoscopy, Imaging, Urology referral, Gyn referral

INCIDENTS	CARCINOGENIC EXPOSURES	WORKUP
HOME and AUTO FIRES	<ul style="list-style-type: none"> ○ Polycyclic aromatic hydrocarbons (PAHs) and formaldehyde from smoldering plastics and synthetics ○ Brominated dioxins and furans from flame retardants 	See: Firefighter Comprehensive Physical Exam (CPE) Template
FIREHOUSE	<ul style="list-style-type: none"> ○ 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

Recommended Firefighter Physical Exam and Screening Tests

Annual Exam	Annual Labs and Screening Tests
<ul style="list-style-type: none">○ Blood pressure, pulse	<ul style="list-style-type: none">○ Comprehensive metabolic and chemistry panel
<ul style="list-style-type: none">○ Respiratory rate , temperature	<ul style="list-style-type: none">○ Liver function tests
<ul style="list-style-type: none">○ Oxygen Saturation	<ul style="list-style-type: none">○ Hepatitis profile
<ul style="list-style-type: none">○ Weight and body fat index	<ul style="list-style-type: none">○ Complete blood count
<ul style="list-style-type: none">○ Thorough skin exam	<ul style="list-style-type: none">○ Thyroid panel
<ul style="list-style-type: none">○ Eye exam and hearing testing	<ul style="list-style-type: none">○ Hemoglobin A1c (for diabetes monitoring)
<ul style="list-style-type: none">○ Oral exam	<ul style="list-style-type: none">○ Fasting lipid profile and blood glucose
<ul style="list-style-type: none">○ Heart and lung exam	<ul style="list-style-type: none">○ Urinalysis and urine biomarkers
<ul style="list-style-type: none">○ Abdominal and testicular exam	<ul style="list-style-type: none">○ EKG
<ul style="list-style-type: none">○ Prostate and rectal exam	<ul style="list-style-type: none">○ PSA (begin at age 40 for prostate cancer screening)
<ul style="list-style-type: none">○ Fecal occult blood testing	<ul style="list-style-type: none">○ Pulmonary function test every 3 years
<ul style="list-style-type: none">○ Pelvic and Pap for females	<ul style="list-style-type: none">○ Low dose helical Chest CT scanning to begin at age 50
<ul style="list-style-type: none">○ Vascular and neurological exams	<ul style="list-style-type: none">○ Colonoscopy (begin age 40 and every 5 years)
<ul style="list-style-type: none">○ Mental status exam	<ul style="list-style-type: none">○ Exercise stress echo (begin age 40 and every 3 years)
<ul style="list-style-type: none">○ Musculoskeletal exam	<ul style="list-style-type: none">○ Mammograms for females (begin age 35)



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

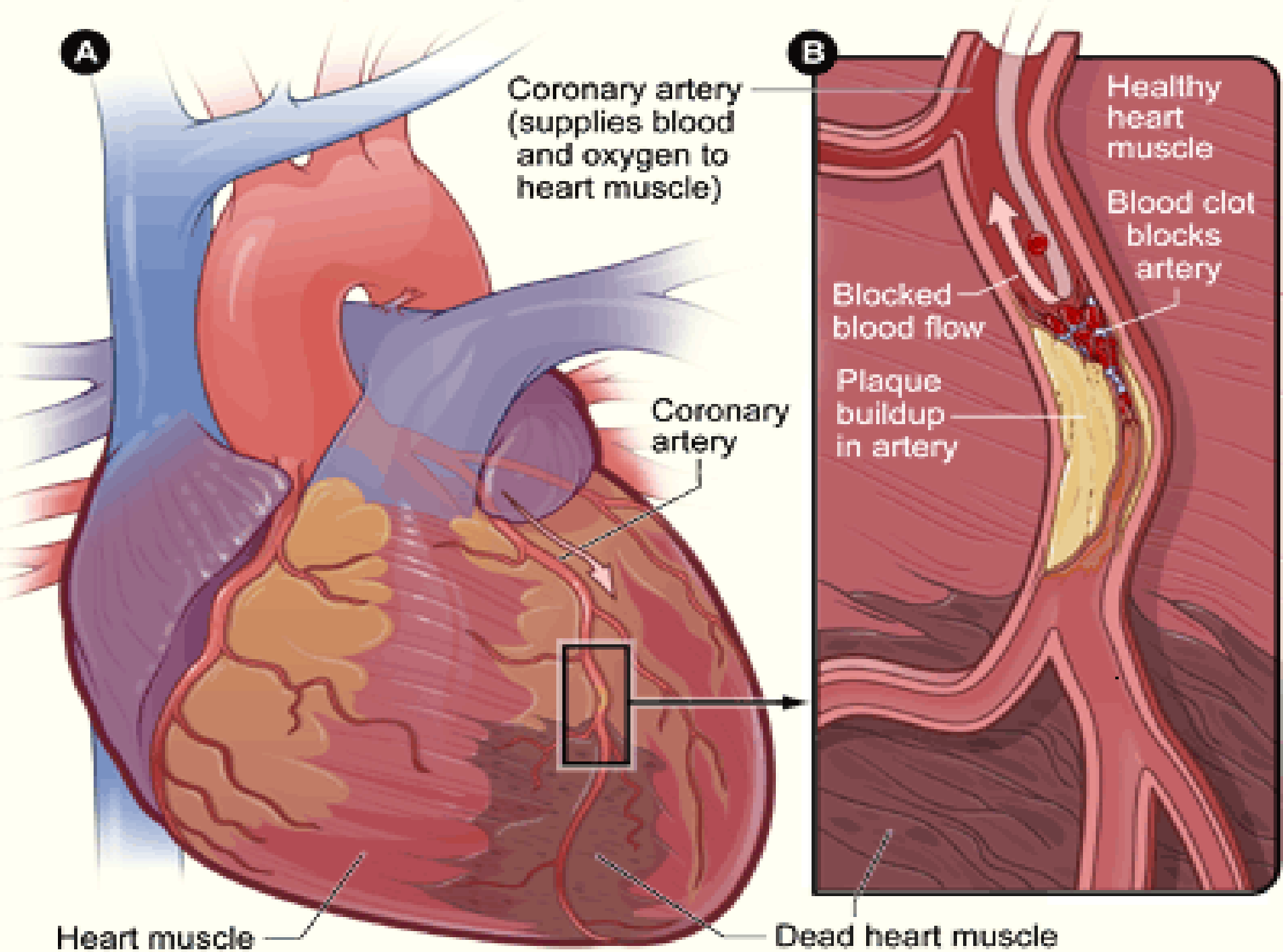
Coronary Artery Disease (CAD)

- **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



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

Recommended Firefighter Physical Exam and Screening Tests

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○ Thorough skin exam	○ Thyroid panel
○ Eye exam and hearing testing	○ Hemoglobin A1c (for diabetes monitoring)
○ Oral exam	○ Fasting lipid profile and blood glucose
○ Heart and lung exam	○ Urinalysis and urine biomarkers
○ Abdominal and testicular exam	○ EKG
○ Prostate and rectal exam	○ PSA (begin at age 40 for prostate cancer screening)
○ Fecal occult blood testing	○ Pulmonary function test every 3 years
○ Pelvic and Pap for females	○ Low dose helical Chest CT scanning to begin at age 50
○ Vascular and neurological exams	○ Colonoscopy (begin age 40 and every 5 years)
○ Mental status exam	○ Exercise stress echo (begin age 40 and every 3 years)
○ Musculoskeletal exam	○ Mammograms for females (begin age 35)

Screenings for heart disease

❑ 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



ROBERT W. GERRARD



IN MEMORY OF ROBERT W. GERRARD
FIRE FIGHTER IN THE BOSTON FIRE DEPARTMENT
THE BOSTON FIRE DEPARTMENT
JUNE 1983

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