MnFIRE

Taking the Lead

MINNESOTA FIREFIGHTER INITIATIVE

Gearing Up for Health

MnFIRE

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Executive Summary

From the beginning, in 2016, the Minnesota Firefighter Initiative (MnFIRE) has established itself as the leader for Minnesota firefighters to find the resources that they need when dealing with the issues of cardiac disease, emotional trauma, and cancer.

This document provides the foundational elements of the Minnesota Firefighter Initiative, the current status and best practices for cardiac disease, emotional trauma, and cancer within the Minnesota fire service, a recap of the Fire Service Advisory Council grant activity, and how MnFIRE plans to continue to achieve their goal.

The goal of the Minnesota Firefighter Initiative is to reduce the rates of cardiac disease, emotional trauma, and cancer within the fire service to below those of the general public.

Cancer, emotional trauma, and cardiac disease are affecting firefighters at rates that are approximately double those of the general public.

Our local heroes are dying and being disabled by cancer, cardiac and emotional trauma at alarming rates. The causes are many and all three issues are linked to one another.

The path forward is a five pronged approach that takes place simultaneously so that the impacts get addressed immediately and the long-term impacts get cutoff with this generation of Minnesota firefighters. The five pronged approach includes: Education, Prevention, Support, Research, and Regional Provider Networks.

Education has begun throughout the state with the MnFIRE Awareness Training. This training has been delivered to 389 departments, reaching approximately 7,900 firefighters across Minnesota. This number doesn't include the many families of firefighters who were included in the classes. These classes educated firefighters and their families on job-related hazards, and working with local government, elected officials, and policy makers.

Prevention is the key to reducing the risks of firefighting. While prevention starts with accepting personal responsibility for firefighter health, that alone is not enough. MnFIRE works to equip Minnesota firefighters with the most up-to-date information when it comes to their health.

MnFIRE also provides support by never letting a firefighter walk alone when dealing with one of the maladies discussed above by different avenues.

MnFIRE is also involved in the research being conducted at many different levels, including through the University of Minnesota and HealthPartners.

The last "prong" is the Regional Provider Network. The Minnesota Firefighter Initiative is working to make sure firefighters have access to the care they need within only a short drive.

MnFIRE is taking the lead in Minnesota as the resource for firefighters in the state and for those who support them!

The History of the Minnesota Firefighter Initiative (MnFIRE)

The Minnesota Firefighter Initiative was started after attending the Rosecrance Florian Symposium (September 2016, Chicago, Ill.). This conference focused on the crisis of firefighters' mental health. After attending the conference, two attendees returned and used what they learned to hold a Minnesota Fire Service Summit on firefighter mental health. This summit was held in November 2016.

The participants in the summit represented the whole of the Minnesota Fire Service (Minnesota Professional Firefighters, Minnesota State Fire Department Association, Fraternal Order of Leatherheads, Minnesota State Fire Chiefs Association, Fire Marshal's Office, Cities of the 1st Class, and regional CISM Team members). The momentum was contagious and significant progress was made towards defining the problem in Minnesota and building steps to begin solving it. Then one of the participants asked, "This is all good, but what about the other things that are killing us? Like cardiac disease and cancer?"

With the representation in the room everyone knew that you couldn't separate the issues and be successful with any initiative. Especially with the progress that had been made towards emotional wellness/mental health. So, after a brief pause and a little assistance, the Minnesota Firefighter Initiative, or MnFIRE, was born. MnFIRE focused on the three leading causes of firefighter fatalities: cardiac disease, mental health, and cancer.

One of the cornerstones of any MnFIRE course delivery is never talking about only one of the three ailments; for example, even when the focus is on training Peer Supporters for mental health, MnFIRE talks about the co-morbidities of cancer and cardiac disease and the potential links to a firefighters' mental health.

The kick-off event for MnFIRE was training 40+ peer supporters using the Illinois Peer Support team to train the MnFIRE team and get them headed in the right direction. Shortly after training the peer supporters, MnFIRE launched the toll-free number (888-784-6634) and website. Initially the hotline focused on peer support for emotional trauma but quickly expanded to include answering questions related to cardiac disease and cancer.

As MnFIRE expanded into the other areas, they worked to partner with or align with subject matter experts from each of the areas. The subject matter experts are committed to improving firefighter health within their area of expertise and are essential for the success of the Minnesota Firefighter Initiative.

Today, MnFIRE continues the work to build the regional centers of excellence, focused on firefighters and those that care about them.

CARDIAC — Current Status

Matt Frantz, Rice Lake fire chief, was sent home after responding to a call at 1 a.m. for a chimney fire because he wasn't needed. Later that day, Matt died of a heart attack at age 42.

Cardiovascular disease is the number one killer of firefighters nationwide and is by far the leading cause of line-of-duty deaths in the fire service. According to the International Association of Firefighters, more than 12 percent of all firefighters will develop heart disease at some point in their lives. Even young and healthy firefighters suffer from hardened arteries and impaired heart function after just three hours of prolonged firefighting, according to a 2010 study from the Illinois Fire Service Institute.

According to the HealthPartners Occupational Medicine MD team, firefighting strenuously challenges the individual in terms of both strength and cardiorespiratory status. Cardiorespiratory fitness (CRF) testing needs to be performed on all firefighters as a baseline and as an ongoing metric to evaluate their level of fitness. This is the key metric that allows firefighters to engage safely in this challenging work. There needs to be a commitment to endurance training and outcomes measured by CRF testing in order to minimize adverse cardiac events among firefighters.

Sleep also plays a crucial role in limiting cardiac issues. If firefighters do not get enough quality sleep, resting metabolic rates decrease and cause weight gain, increasing the risk of heart attack and stroke. Maintaining work schedules – by providing proper staffing – and allowing firefighters to get enough sleep can be paramount in preventing cardiac disease.

Traumatic stress can also increase a firefighter's risk of heart attack. A study from the University of California – San Francisco found that even limited exposure to trauma can boost inflammation in the body, a key risk factor for heart disease. Overall, pulmonary health can also negatively impact heart health. Breathing in toxic fumes and particles during overhaul, exhaust pollution from the apparatus bay and exposures during regular calls can adversely affect lung function, which is associated with an increased risk of heart failure.

Firefighters tend to embrace a "do whatever it takes" attitude when on the job – the goal of MnFIRE is to get firefighters to take the same approach to their health.

EMOTIONAL TRAUMA — Current Status

Three of former St. Paul firefighter Brian Cristofono's colleagues — and friends — took their own lives, and Cristofono himself attempted suicide twice. PTSD cost him his marriage and, ultimately, his job. The City of St. Paul denied his disability claim, stating that unless there was a physical injury associated with a fire, PTSD could not exist. Cristofono was forced to retire and now lobbies to make it easier for firefighters to claim PTSD as a job-related injury.

Scott Geiselhart, with the Frazee fire department, turned to alcohol and eventually methamphetamine to deal with his PTSD. Talk therapy has helped Scott cope with his trauma and kick his addictions. His department now has debriefings after every traumatic call to help firefighters work through what they experienced.

An abundance of recent research shows that those in the fire service experience much higher rates of mental health challenges than the general population – particularly in the areas of sleep disorders, depression, substance abuse, post-traumatic stress disorder and suicidal ideation/action. In fact, research suggests that there is an association between the number of years of duty in the fire service and higher levels of suicidal ideation/action.

The on-the-job bravery of firefighters is legendary, but that doesn't mean they should suffer in silence when facing occupational stress and emotional challenges – ignorance and lack of support from the fire service often make emotional health concerns worse over time.

Dr. R. John Sutherland, with North Memorial Medical Center, said he often sees firefighters experiencing something he refers to as a "hero complex" – if they go get help, then they're not strong enough. He says most firefighters can recall at least three traumatic events, but it's the failure to talk about those memories that creates a dangerous feedback loop.

National standards (such as NFPA 1500) recommend that all firefighters have access to behavioral health services, yet many departments don't have programs in place due to budget realities and other priorities. An Employee Assistance Program (EAP) is often provided through employer health plans, but because 93 percent of Minnesota firefighters are non-career, EAPs are often not available to them because of their part-time status. In addition, it's important to ensure that EAP assistance is firefighter specific and responsive to the unique challenges they face.

Mental and emotional health is as important as physical health for firefighters. Having a proactive mental health program can save fire departments significant time and money in the long run, not to mention the lives of brothers and sisters in the fire service.

Some of the fundamental pieces of behavioral health programs that can help save lives include:

- Regular mental health or behavioral health education
- Employee Assistance Program (EAP)
- Easy access to counseling services – paid for by the department, union or health plan
- Formal mental health "fitness for duty" examinations
- Critical Incident Stress Management (CISM) debriefings
- Family Support Night
- Peer Support Team

Also, non-clinical interventions – such as peer support – can be an effective starting point for assessing and managing firefighters' emotional stress levels without causing additional stress, concern or stigma. Firefighters see and experience traumatic situations on a regular basis, many of which would be unbearable for an ordinary citizen. We must end the stigma attached to mental health challenges and ensure firefighters have an outlet for processing traumatic experiences.

MnFIRE EMOTIONAL TRAUMA SUPPORT

The Minnesota Firefighter Initiative (MnFIRE) provides a Help Line service and a website for firefighters who are impacted by cardiac, cancer and emotional trauma. Minnesota firefighters can either dial **888-784-6634** and leave a message or go to **mnfireinitiative.com** to initiate confidential support.

When a firefighter makes contact via the help line or the web, our intake volunteers typically call back within one hour to conduct a triage assessment to determine nature, severity and immediate needs. While we are the resource for cardiac, emotional trauma and cancer; more than 90% of call activity is for emotional trauma.

MnFIRE Help Line Call Activity

Year	Total	Cardiac	Cancer	Emotional Trauma	Hang Ups	Other
2017	13	1	0	10	2	0
2018	38	0	0	28	10	0
YTD 8/15/19	76	0	3	63	4	6
Total	127	1	3	101	16	6

Help line call activity has increased 400% as a direct result of the MBFTE funded MnFIRE Awareness training which started in October of 2018. Activity changed from an average of two calls per month prior to October 1, 2018 and went up to eight calls per month after.

MnFIRE Awareness Training Impact on Call Activity

Period	Calls	Months	Calls/Month
Prior to 10/1/18	38	17	2.2
Since 10/1/18	89	10.5	8.5

The MnFIRE emotional trauma support team consists of a primary intake coordinator and a backup intake coordinator. Clients calling for emotional trauma are assessed by the intake coordinator using a triage questionnaire designed to determine the nature and severity and immediate needs. The MnFIRE medical director assists intake staff with determining next steps. In most cases a peer supporter is assigned and if necessary intake staff will assist with connecting the client with mental health counselors.

Firefighters in crisis are encouraged to call 911 or to go their nearest emergency room. Firefighters inquiring about cancer are referred to the Minnesota Chapter of the Firefighter Cancer Support Network.

A day in the life of MnFIRE Support Intake Coordinator:

Callers run the gambit. There is the first year firefighter who has had the one horrific event at the beginning of his career that he cannot get past. He cannot shake the images of the young mother who was stabbed to death which firmly planted the sliver in his brain and has since grown the infection. He has taken to drinking, one liter of vodka and two bottles of wine, every. single. day. The majority of callers take to drinking. They drink to lessen the pain and “take the edge off” by self-medicating. It only adds another problem to the mix and enhances the trauma already embedded in their brains. This young firefighter was one of the first callers to the MnFIRE line. His story is not uncommon and most firefighters can relate with their own personal stories of trauma.

Then there’s the chief with more than 40 years experience, who never had an issue before because he carefully navigated the years of trauma and held them at bay. Until the month before he decided to retire — the floodgates opened up. He, like many firefighters, called into the hotline asking for help. Help, to understand why he was angry all the time, why he was quick to anger and to yell at his wife and children for no reason, and why he cries uncontrollably over and over again. And doesn’t know why.

Firefighters bring all five of their senses to each and every call: touch, sight, sound, feel and taste. A chief in attendance at an Awareness Training said he was triggered to anxiousness and anger immediately upon hearing his young son whistling. A simple innocent whistle can mean so much more to a firefighter, if it was part of a traumatic incident to which they responded. Not until the chief worked with a therapist did he realize the connection and meaning behind the trigger. He was given resources and tools to help mitigate the trigger in the future.

The 19-year-old firefighter who responded to a house fire so hot that he did not realize the slippery substance under his feet was the woman they were searching for until he was standing there. The sounds, images and smells are forever etched in their memory, and the flashbacks and nightmares keep them up at night. If they do not seek the proper resources and counseling after an individual traumatic event, or after years of accumulation of many horrific events, the infection grows. It grows and firefighters strap on their coping skills. The more they see, the thicker the coping scab of protection gets. It continues until one day the scab is breached and the infection begins to seep. The memories and experiences are overflowing and need to come out.

These are the calls for help, and MnFIRE is there.

CANCER — Current Status

In Albert Lea, in a department with 16 full-time firefighters, three got cancer within one year.

Firefighters experience higher rates of certain types of diagnoses and cancer-related deaths compared to the general U.S. population, according to a multi-year study from the Centers for Disease Control and Prevention (CDC). According to the National Institute for Occupational Safety and Health (NIOSH), firefighters have a 9% higher risk of being diagnosed with cancer and a 14% higher risk of dying from cancer. The rate of line-of-duty deaths from cancer-related illness is rapidly increasing and is on pace to overtake cardiac disease as the leading killer of firefighters nationwide.

The most frequently diagnosed cancers in firefighters are found in the digestive, respiratory and urinary systems, as well as orally, including the salivary glands and throat.

Specific cancers related to carcinogen exposure – such as malignant mesothelioma – are more than twice as prevalent in firefighters as in the general population. The chance of lung cancer and leukemia diagnoses, and cancer-related death increases with the amount of time spent at fires.

Despite statewide bans on fire retardant chemicals, the presence of existing synthetic materials increases the amount of smoke and toxic gas released during occupied structure fires. Dirty or ill-fitting turnout gear can increase the risk of exposure to carcinogens, and prolonged exposure to the skin and lungs is especially dangerous. In order to limit occupational cancer risk, the fire service must improve efforts around proper training, use, cleaning and maintenance of protective gear during all phases of firefighting.

Minnesota is one of 33 states to recognize these cancers as an occupational hazard of being a firefighter. According to OSHA, in the last decade, only one firefighter in all of Minnesota has had his or her cancer accepted as an occupational injury.

There are efforts in place to implement a measure that would create a statewide registry to track the number of firefighters with cancer. Regardless, it is critical to:

1. Enact policy changes so state statutes clarify that cancer is indeed an occupational injury – so inconsistent decisions don't create additional stress and hardship for firefighters suffering from cancer.

2. Shift the burden of proof from firefighters to their employers — and adopt a philosophy of taking care of firefighters rather than fighting them.

3. Provide gear extractors to fire departments across the state, an essential tool to properly clean firefighters' personal protective equipment.

Firefighter Cardiovascular Diseases

By Dr. Paul J. Anderson

Every year in the United States, approximately half of all on-duty deaths among firefighters are caused by cardiovascular events, primarily heart attack and stroke. Numerous studies have shown that combination of the intense physical demands of front-line firefighting and a lack of physical readiness in the firefighter cause these deaths. Firefighter education, departmental adherence to NFPA 1582 and 1583, and personal lifestyle changes among firefighters are key solutions to this problem.

In the general population, cardiovascular diseases are the leading cause of death in the United States. The major heart diseases include coronary artery disease (CAD), electrical conduction abnormalities of the heart, arrhythmias such as atrial fibrillation and ventricular fibrillation, cardiomyopathy (heart muscle defects), and congenital heart defects such as a patent ductus arteriosus or valve abnormalities.

According to the Centers for Disease Control and Prevention, Heart disease causes 1 in 4 deaths the each year in United States, approximately 600,000 deaths per year. More than half of these deaths occur among men. The majority of deaths from heart disease are related to coronary artery disease. There are approximately 370,000 coronary artery disease deaths per year in the United States. Overall, there are approximately 735,000 heart attacks each year in the United States.

Coronary artery disease (CAD) develops from plaque buildup in the arteries of the heart which leads to narrowing of the blood flow passage and decreased flow of blood to the heart muscle. Plaque buildup can lead to total occlusion of the coronary arteries or the plaques in the coronary arteries may rupture causing a complete cessation of blood flow to the heart muscle called ischemia. Ischemia leads to muscle death, decreased heart function, and in some cases rupture of the muscular wall of the heart.

The main risk factors for coronary artery disease include smoking, high blood pressure, and high cholesterol. About half (47%) of all Americans have at least one of these risk factors. In general, coronary artery disease is a lifestyle disease, meaning that behavioral choices in the individual are the primary causes of the disease state.

The major risk factors for coronary artery disease can be grouped into several categories including personal factors, pre-existing health conditions in the firefighter, health behaviors, and occupational risks. Personal factors including family history of early cardiovascular disease death in a first-degree relative, increasing age, gender, and race/ethnicity convey increased risk of coronary artery disease to the firefighter. Pre-existing conditions such as high blood pressure high cholesterol, diabetes, and obesity also place firefighters at increased risk of coronary artery disease. Firefighters will experience added risk from eating an unhealthy diet, physical inactivity, excessive alcohol use, or smoking. In addition to these risk factors, firefighters experience risk from an anoxic environments, fine particulate matter, extreme cardiovascular and muscular challenge during active firefighting, heat stress, excessive noise, shift work, and increased stress levels.

The physical demands of firefighting create acute health risks for firefighters that have an underlying cardiovascular disease. On average, typical firefighting equipment weighs 60 pounds which includes turnout gear, tools, and self-contained breathing apparatus. While wearing this equipment, firefighters engage in physical maneuvers including but not limited to stair climbing, victim rescue, demolition, running, crawling, and the hauling of a charged fire hose. In addition, these activities are undertaken in extreme heat and in the context of heightened sympathetic activation (i.e. stress and anxiety) which only intensifies the extreme strain in the cardiovascular system encountered during structural firefighting.

According to the United States Fire Administration, in 2018 there were 25 sudden cardiac deaths with onset while the victim was on-duty. Cardiac-related events accounted for 44% of the on-duty fatalities over the past 10 years (2008 through 2018). NFPA research

from 1977 through 1986, shows an average of 60 firefighters a year suffered sudden cardiac deaths while on duty (44.7% of the on-duty deaths during that period). These are cases in which the onset of symptoms occurred while the victim was on-duty and death occurred immediately or shortly thereafter. The average number of deaths fell to 44 a year in the 1990s and to 31 in the past decade. In spite of this reduction, sudden cardiac death continues to be the number one cause of on-duty firefighter fatalities in the U.S., and in almost every year has accounted for the single largest share of deaths in the year. In addition, countless deaths occur annually of current and former firefighters whose health was compromised during their years in the fire service.

Selected narratives from 2018 related to firefighter cardiac death were included in the NFPA report and are included here to illustrate the gravity of the problem.

SUDDEN CARDIAC DEATH FOLLOWING TRAINING

At approximately 7:45 a.m., a 30-year-old career firefighter arrived at the firehouse for his 24-hour shift. Soon after arriving, he began washing and cleaning apparatus and checking equipment. After morning equipment checks, the firefighter helped move over 200 pounds (90 kg) of trauma kits into a vehicle in the back of the station. A half hour later, he and his truck mates repaired a pull out tray located in an upper storage compartment on the heavy rescue. During the repairs, he was on a ladder and handed down numerous heavy tools and then repaired the pull out tray and placed all items back into the compartment. For the next three hours, the firefighter performed more vehicle maintenance and then participated in training with five other firefighters. The training evolution consisted of donning structural firefighting protective ensemble including self-contained breathing apparatus (SCBA), and performing search training while on air. The members participating then performed low profile and maneuvered through tight spaces under a fire truck while on air. At the end of the drill, the victim had used more than half of his air cylinder and began complaining of chest discomfort. The training ended around 2 p.m., when the firefighters ate lunch and had some down time in the firehouse. At approximately 7 p.m., the victim took 200mg of Ibuprofen and seemed unsettled for the next few hours. Fellow firefighters observed the victim kneeling on the concrete in obvious discomfort. He stated that he thought he pulled a pectoral muscle. At 10:30 p.m., the victim informed his company officer he was going home before the "pain struck again". The victim left the firehouse and went home, which was located a mile (1.6 km) down the road. An hour later, the victim's wife dialed 911 reporting her husband was unconscious. Fellow firefighters arrived on scene and began advanced life support measures and he was transported to the hospital where he died from an acute myocardial infarction. The fire department does not provide annual physicals for its members but does have a voluntary wellness and fitness initiative.

CARDIAC EVENT IN A 64-YEAR-OLD VOLUNTEER RESPONDING TO FIRE

A local volunteer fire department received calls reporting a dwelling on fire. Firefighters were dispatched at 1:46 p.m. A firefighter with nine years' experience responded in his personal vehicle to the firehouse, got out of his vehicle, donned his turnout coat, and bunker pants, climbed into the front driver's seat of the engine company and responded at 1:48 p.m. with another firefighter. The engine arrived in two minutes and the crews encountered a confined cooking fire on the stove. The driver suffered a medical emergency while sitting in the driver's seat, never leaving the cab of the truck. Fellow firefighters unfastened his seatbelt and removed him from the cab. They brought him to the ground where they initiated basic life support. An advanced life support ambulance was dispatched on the initial call and arrived on scene to begin life saving measures. The 64-year-old victim was initially in ventricular fibrillation (NFPA Research pg. 20) and CPR was initiated and sustained using a mechanical CPR device. An intravenous line was established. The victim intubated in accordance with local protocols, and was defibrillated five times. He was transported and treated at the emergency room. Resuscitation efforts ceased just over an hour later.

CARDIAC EVENT AT STATION WHILE PREPARING FOR DRILL

A 31-year-old captain who was the son of the fire chief was at the firehouse alone preparing for an upcoming company drill. He was wearing his protective ensemble and using SCBA. The fire chief, driving by the firehouse, saw his son's truck and stopped to see what he was doing. He opened the front door of the firehouse and heard a PASS device sounding. He found his son unresponsive on the apparatus floor, with his face piece off, but wearing his SCBA. The chief immediately requested an advanced life support ambulance. The victim had been with the department for 15 years and was an active member. He had a preexisting condition of deep vein thrombosis and pulmonary embolisms. According to his physician, he had been cleared for firefighting duties and activities.

CARDIAC EVENT AT STATION FOLLOWING STRENUOUS ACTIVITY DURING RESCUE

A 32-year-old assistant chief was at the firehouse cleaning equipment that had been used in a trench rescue earlier in the day. He was found unresponsive in the firehouse bathroom by his co-workers who immediately performed cardio pulmonary resuscitation. The chief had performed strenuous activity while operating at a technical rescue two and a half hours prior to his death. An autopsy was performed on the victim and post mortem results indicated he had a prior cardiac history of hypertension and coronary artery disease (CAD), including left ventricular hypertrophy (LVH), a risk factor for sudden cardiac death. The autopsy results also indicated that LVH can be caused by hypertension and CAD. The cause of death identified through the medical examiner was most likely hypertensive and atherosclerotic cardiovascular disease. The department indicated it does not have an established wellness and fitness initiative, but does provide annual physicals to its members.

These cases illustrate a number of important realities regarding cardiovascular disease among firefighters. First, all of these victims had some form of underlying cardiovascular disease but were still cleared for firefighting duties. Second, there appears to be a lack of awareness among firefighters in these areas about the symptoms of heart attack and heart disease. Third, the existence of rigorous annual screenings and/or well-being programs is variable among fire departments.

Reducing the risk of cardiovascular disease death among firefighters in the United States depends upon reducing the upstream cumulative risks of heart attack in this working population. Some interventions rely on departmental leadership and funding and some interventions are the professional responsibility of the firefighter. Departmental leadership can prioritize the promotion of safe firefighting practices according to NFPA 1582 and 1583, the use of a self-contained breathing apparatus during overhaul, and the implementation of recovery and recycle rotations that provide adequate rest during strenuous activity. Annual medical examinations should be provided whenever possible and should focus on robust coronary artery disease screening including smoking status, blood pressure management, and cholesterol measurement. The implementation of annual cardiorespiratory fitness testing that meets recommendations in NFPA 1582 (VO_2 max = 42 mL/kg/m; 12 METS) alone would provide significant reductions in the prevalence of cardiovascular risk factors in departments where it is implemented. Departmental leadership can also provide education regarding cardiovascular diseases and how to reduce the risk of death on the job from a heart attack. Well-being programs serve to provide a stimulus for culture change in the fire service.

Firefighters can take several actions to reduce their pre-existing risk profile before they engage in firefighting activities. First of all, firefighters should understand their pre-existing risk for coronary artery disease and other heart diseases. Every firefighter should be educated that if they have early onset of coronary artery disease (a coronary artery disease event in a first-degree male relative younger than 55 years of age or in a first-degree relative who is female less than 65 years of age places them at increased risk) in a first-degree relative they should have more frequent cholesterol checks, and they should lower their threshold to start medication to control cholesterol. Education for firefighters should include demonstrating how they can use the American College of Cardiology/American Heart Association cardiovascular risk calculator online. Firefighters should be educated about blood pressure management through eating a low-sodium diet, regular physical activity, and the use of medication if needed. They should also be screened and educated regarding elevated serum cholesterol and how to control it through lifestyle modification or medications, if needed. Diabetic firefighters should be carefully educated regarding adequate control of blood sugar and how their condition predisposes them to cardiovascular disease and increased risk of death on the job.

Lifestyle modification should be a core component of all education for firefighters to reduce cardiovascular disease risk. First, firefighters must not smoke and those who do should be encouraged to quit. Individuals who wish to quit smoking should be provided with readily available support structures for the next cessation attempt. Typically this involves the use of medication, counseling, and group therapy as needed. Second, every firefighter should receive education about moderate alcohol consumption and eating a diet that is predominantly whole food, plant-based, and that avoids processed foods. Many chronic conditions that are risk factors for cardiovascular disease (high blood pressure, high cholesterol, diabetes) can be reversed with the implementation of strict dietary changes. Firefighters should be educated about the tracking applications

on their phones or smart devices that will allow them to document their eating habits and improve portion control and food selections. Third, every firefighter should receive education about minimal requirements for physical activity, including at least 150 minutes of moderate activity every week. For those who already maintain a physical activity regimen, high intensity interval training that mimics firefighting duties should be included on a weekly basis to improve readiness for the extreme physical challenge of firefighting duties. Strength training is also a critical element of physical readiness for firefighters because muscular fitness and capacity reduces cardiovascular demand. Firefighters should be encouraged to perform large muscle group and core strength training using body weight or other weights at least twice a week.

In general, most studies reveal that educational efforts towards behavior change must be combined with some level of personal coaching and cultural reinforcement if they are to be effective. The fact that firefighters form intense team relationships through living, eating, and working together provides a tremendous support for behavior change. Each department, and perhaps each station can create their own unique culture regarding well-being that will serve as a support or a barrier to reducing cardiovascular disease risk. The transformation of firefighter cultures and the presence of lifestyle coaching programs are the hallmarks of the department with low risk levels for cardiovascular disease events.

Beyond the Fire: The Mental & Emotional Cost of Being A Firefighter

By Dr. Margaret Gavian

Stress, and particularly traumatic stress, is an occupational hazard of being a firefighter. The National Institute for Occupational Safety and Health (NIOSH) defines job stress as the harmful physical and emotional responses that occur when job demands do not match the resources or needs of employees (NIOSH 2011). All first responders have a particularly high exposure rate to traumatic stress inducing incidents. Doing chest compressions on an unconscious child, working to free a mother trapped in her vehicle after a collision, being with someone as they die, or recovering a body from a variety of unpleasant situations, are the daily realities of this job.

Industry leaders agree that being a firefighter today is vastly different than it was in years past; firefighters are being asked to do more with less, and with the net effect being more exposure to traumatic incidents, more stress, and more fatigue. Call volume has increased beyond fighting fire, with more medical and mental health calls, and increased exposure to motor vehicle accidents, violent crime, and medical complexity. Providing round the clock service, firefighters often witness trauma in a disrupted sleep state, already fatigued. This is true for both career and non-career firefighters. Non career firefighters are often busy serving their community at night, only to have to work their “regular” job during the day while continuing to fulfill their roles as parent, friend and spouse. More than 90% of Minnesota’s fire service is non-career.

Whereas civilians may experience traumatic events only a few times in their life, firefighters experience these stressful events on a weekly, sometimes daily basis (Gulliver, 2015). This exposure accumulates over time and takes a significant toll on mental, emotional, and physical health. Support and services available to Minnesota’s 22,000 firefighters is scarce, leaving the burden of care on the individual and resulting in an overall department loss. Additional systemwide solutions are vital to keeping firefighters on the job and able to fulfill their deep commitment to service. They’re also essential to reducing turnover and healthcare costs when stress related disorders become chronic and to alleviating the havoc mental health disorders can wreak on families, children, and generations to come. If we expect firefighters to show up for us on our worst days, it is our responsibility to care and assist them on theirs.

According to the American Psychological Association, trauma-related stress is officially defined as when an individual either directly experiences, witnesses, or hears the aversive details about actual or threatened death or serious injury (APA, 2013). Exposure to trauma is a weekly, unavoidable part of the work of firefighters (Pao & Tran, 2017) and is associated with a variety of negative and behavioral health consequences including, Post-traumatic Stress Disorder (PTSD), depression, substance use, divorce and suicide. It is estimated that at least 1 in 5 firefighters will struggle with behavioral health issues throughout the course of their careers (IAFF, 2017). Recent data reported that 13% of firefighters screened positive for PTSD, and 53% screened positive for both anxiety and depression separately. The 12-month prevalence of these clinical disorders among the U.S. general population is 3.5% (PTSD), 7% (depression), and 2.9% (anxiety) respectively (Wiegland & Chiu, 2017).

POSTTRAUMATIC STRESS DISORDER

PTSD is a significant, debilitating health condition that disproportionately impacts firefighters. The data reported above estimates that firefighters report PTSD symptoms approximately 4 times more than the general population. Some studies have found that anywhere between approximately 7-37% of firefighters meet full criteria for PTSD. Common symptoms include nightmares, intrusive memories, avoidance, numbing, sleep, mood and thinking problems, as well as feeling perpetually on guard. Quality of life for those that have PTSD is dramatically low, isolating the firefighter from the people and activities they love and care about. Having PTSD can be bleak and truly a dark night of the soul.

Although treatable, people with PTSD often suffer silently for prolonged periods of time before asking for help, and often after the symptoms have devastated

their personal lives, marriages, relationships with children, and their ability to function on the job. The hyperarousal symptoms make it hard to “turn off”, near impossible to sleep or sustain concentration on a task at hand. Bad memories come when least expected and emotionally sucker punch their victim. The mind follows this pattern, ruminating without resolution on those calls – what happened, didn’t happen, and why. The avoidance symptoms create a lonely and isolative existence making it seem as if no one understands, that no one would want to understand, and that others should be protected from knowing about the “dark underbelly” of humanity.

The emotional and mental cost of PTSD is great, however, there is also a significant financial one as well. Although there is a dearth of research on this specifically in the fire service, the cost of PTSD as measured in a military population has been estimated to be 4-6 billion dollars over a two year period (Gulliver, 2015). There are many commonalities between military veterans and firefighters, and in fact, due to hiring practices, veterans are actually over represented in the fire service. PTSD can result in early retirement or a firefighter going out early on disability - a substantial loss felt on an individual level. Other losses, however, such as training costs, loss of years of experience and knowledge within the department itself create a financial burden on fire departments and leadership as well. Even the temporary loss of firefighters due to mental health conditions exacerbates staffing shortages and increases the cumulative stress of those who continue to work.

stressors. Many individuals with PTSD also have comorbid substance use disorders with up to 50% actively misusing substances. Although not all people with substance use disorders have PTSD, people with trauma often turn to substances to calm themselves, relax, and temporarily medicate their symptoms.

Addiction to alcohol, drugs and cigarette smoking is now regarded as a major public health problem (Ali et al., 2011). According to a collaboration between the International Association of Firefighter’s (IAFF) and the International Association of Fire Chiefs, alcohol is the most common substance of abuse among firefighters, https://www.drugrehab.com/addiction/firefighters/.

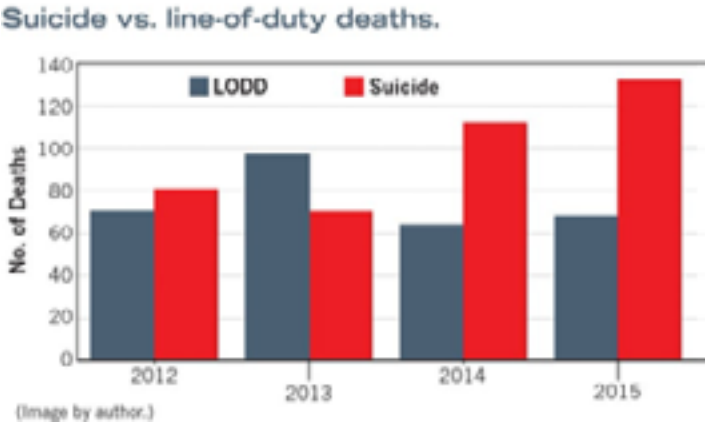
In their review of firefighter mental health, Jahnke and colleagues (2016) discussed several studies that documented high rates of alcohol and drinking in firefighters, noting that 45-58% of firefighters (both volunteer and career) reported binge drinking episodes in the last month. This rate is higher than the general population, in which estimates are only 20%. In Haddock et. al’s (2012) first population-based study of alcohol use in the fire service, binge drinking rates were high (56%), and 10% reported driving while intoxicated. This research cites the risk of heavy alcohol use being associated with injuries, neurological impairment, social problems, liver disease and cancer.

Twenty percent of firefighters who responded to the Oklahoma City Bombing reported using drinking as a primary coping strategy of managing the stress of working the event in which many children were injured and killed (North et al., 2002). In particular, PTSD symptoms were directly related to an increase in drinking behavior as well as relapses. Other research has found that those firefighters who are also veterans demonstrate even higher rates of drinking to cope with stress (Gulliver, 2015). The course of addiction, if left untreated, is dire. Combined data from multiple studies (meta-analysis), concluded there is a strong association between substance use disorders and suicide outcomes including ideation, attempts, and death (Poorolajal et al., 2016).

SUICIDE

Given the accumulative and repetitive nature of these stressors, it is not a surprise to see the rising data documenting firefighter suicide. Suicide is a serious public health problem with long-term harmful effects on individuals, families and communities. It is among the greatest sources of premature death and is the 15th leading cause of death worldwide (Poorolajal et al., 2016). It is associated with several risk factors, including being diagnosed with a mental health disorder, alcohol and drug abuse, genetics, cultural and social situations (Poorolajal et al., 2016).

Firefighters are dying by suicide in record numbers. Over the last decade, suicide has surpassed line of duty deaths consistently and the gap between the two rates is only widening (Dreiman, 2017). Please see the figure below.



The emotional pain of witnessing repetitive tragedies takes a significant toll on the individual's ability to engage with their job and their families. Both depression and PTSD are characterized by suicidal thoughts. Many begin to view their own death as the only way out of the ghosts of bad calls, the only way to put down their burdens, and alleviate the deep disappointment in themselves they feel for having "failed" at "getting over it" and not being able to "get back to work" as they believe they should.

It is white, middle aged men who are at a higher risk for suicide generally. National data indicate that men die by suicide at least 3.5 times the rate of women (American Foundation for Suicide Prevention [ASFP], 2019). White males in particular accounted for 69.67% of suicide deaths in 2017, while the highest suicide rate overall is attributed to white, middle aged men (AFSP, 2019). This is the face of the Minnesota Fire Service. National data estimates fire serviced to be 96% men, 85% white, with an average age of 38 (https://datausa.io/profile/soc/firefighters#demographics).

In a survey of more than 4000 first responders, approximately 7% were found to have attempted suicide in the past, a rate more than 10 times that of the general population (Stanley et al, 2015). Recent data reported by the IAFF estimates that approximately half of all firefighters think about wanting to die; 20% will make a plan, 16% will attempt suicide and 16% will injure themselves in another way in an attempt to cope. These numbers are staggering, yet suicide reporting in firefighters has been hypothesized to be vastly underestimated by as much as 40% (Henderson et al., 2015).

STIGMA & GETTING HELP

Admitting there's a problem, and the stigma associated with this, deepens the behavioral health crisis for firefighters. First, even mentioning that one is negatively impacted by a call, or calls, is simply not seen as acceptable in this paramilitary culture of "tough guys". Help seeking in this climate is extraordinarily difficult. The World Health Organization has long identified men generally as having poorer health outcomes for these reasons (UCL Institute of Health Equity (2013). Data has described men's avoidance of doctors and reluctance to fully disclose symptoms as detrimental to health outcomes. Male norms of risk taking and adventure, as well as health beliefs related to masculinity are also factors that impact male health outcomes. Although masculinity is associated with many positive qualities such as leadership, decisiveness, strength, and a take charge attitude, the code of masculinity also has a shadow side that necessitates men maintain their "cool", handle things on their own, and view any sign of emotion as an unspeakable vulnerability and weakness. The IAFF (2017) estimates that 93% of firefighters perceived seeking help as a weakness.

Yarnel et al. (2004) in interviews with firefighters found that interviewees felt they had a public image that society expected them to live up to, that crying or showing emotion would not only bring shame to the individual, but also publicly demonstrate weakness that would directly counter how others expect a public servant to behave:

> *"You have to be strong — people just expect it. You have to say this is part of my life. It's a way of life and without the fire service more people would be hurt."*

Despite high rates of trauma exposure, depression, anxiety, substance use, PTSD and marital distress, firefighters typically suffer in silence. They fear the professional repercussions, the loss of respect and trust of their team, and adopt the culture of "suck it up and get back out there". This unhealthy pattern only perpetuates the development of chronic, debilitating behavioral health conditions, which left untreated may result in suicide.

CALL TO ACTION

Minnesota firefighters are one of the most poorly funded in the nation, ranking 44th nationwide in per capita fire service spending (Minnesota Center for Fiscal Excellence, 2018). The burden of the emotional and mental toll of their work is not an individual problem, but the larger system and cultural problem that continues to perpetuate disturbing rates of mental health and substance use disorders. It is morally, ethically and financially bereft to punish the individual for being injured as a result of his or her deep commitment to our community. Just as we would never expect soldiers to fend for themselves on their return from war, we should not expect the same of our fire service.

When a firefighter finds themselves stressed or suffering, there are few to no options other than to call their insurance company and hope that 1) mental health services are covered and 2) there is a provider in proximity familiar with this unique group's needs. This is a daunting process that few have the internal resources, understanding or stamina to take on.

Funding for additional training and development of behavioral health programming is critical. Focus on prevention, education, access to quality services and ongoing support is crucial. Existing mental health awareness training and peer support is a positive start, but so muchmore is required to provide our firefighters with the internal gear they need to protect themselves from the emotional risks of doing what we ask of them. Another suicide, broken family or hero suffering in silence is simply unacceptable. We can and must do something before burying another public servant.

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The Firefighter Cancer Epidemic

By Dr. Zeke McKinney and Steve Shapira

The Fire Service has a proud tradition of answering the bell whenever the call comes in. No matter who is calling, the time of day, or location, firefighters spring into action to hopefully mitigate the situation and make the public's day a bit brighter.

Modern day emergency calls cover many things -- brush fires, structure fires, automobile accidents, life-threatening medical emergencies, non-life-threatening medical calls, false alarms, and other hazardous situations. All must be responded to with the same speed and professionalism. Firefighters are also our cities' first line of defense during weather-related emergencies, hazardous materials issues, ice & water rescues, building collapses & trench rescues. This truly is now an all-incident profession which requires men & women to become a jack of all trades.

What has also changed are the health hazards firefighters now face. While occupational firefighter cancer is no longer a new topic within the industry, the need to continue with health & wellness, education, and prevention is an ongoing challenge the fire service will face in the foreseeable future.

Firefighter education took center stage nationally in 2013 when the Firefighter Cancer Support Network (FCSN) released their landmark document Taking Action against Cancer in the Fire Service. In April that year, FCSN invited a small group of experts to Indianapolis to develop a white paper on cancer in the fire service. The participants came from the legal, medical, and social research communities, and the fire service — including volunteer, combination and career departments and chief officers, firefighters, company officers, union leaders, and local and state fire training directors. Two firefighters who are cancer survivors participated, and every workshop participant knew firefighters who currently have cancer or who died as a result of cancer. They willingly shared their knowledge, experience, commitment, and questions to better understand and describe the complexity of firefighter cancer awareness. The discussions addressed prevention, diagnosis, treatment, and the long-term implications for the firefighter, the firefighter's family, their coworkers, the fire department, and community policy. Importantly, they also identified a series of actions that firefighters can take to reduce their exposure to chemicals that can cause or facilitate cancer. In two-and-a-half days, the working group outlined and wrote the initial draft of a white paper describing the status of cancer in the fire service and developed answers to very challenging questions. This report is the result of that working group which was enhanced by the additional review of multiple career and volunteer operational fire companies, additional clinical researchers and medical physicians, other stakeholders, and the leadership of the FCSN.[1] At the conclusion of the conference the FSCN boldly declared occupational firefighter cancer to be the most dangerous and unrecognized threat to the health and safety of our nation's firefighters.

With that statement, the fire service set out to define the cancer problem. Is there study-based evidence? Has the science been vetted? The overwhelming answer is yes. For example, Dr. Grace LeMasters and her University of Cincinnati-led team looked at 32 previously published studies covering 110,000 firefighters – most of them full-time, white, male workers – to determine the comprehensive health effects and correlating cancer risks of their profession. She went on to explain, "Firefighters are exposed to many compounds designated as carcinogens by the International Agency for Research on Cancer – including benzene, diesel engine exhaust, chloroform, soot, styrene and formaldehyde.[2]"

These substances may be inhaled, absorbed through the skin, or even directly ingested if proper decontamination methods are not taken. This can happen both at the scene of a fire and in the firehouse; exposure to these carcinogens are not limited to just one facet of firefighting.

Furthermore, "We believe there's a direct correlation between the chemical exposures firefighters experience on the job and their increased risk for cancer" said LeMasters, who is a professor of epidemiology and biostatistics at the University of

Cincinnati (UC) and was the lead author of the study.

UC epidemiologists found that half of the studied cancers – including testicular, prostate, skin, brain, rectum, stomach, colon cancer, non-Hodgkin's lymphoma, multiple myeloma, and malignant melanoma – were associated with firefighting on varying levels of increased risk.

Here is an overview of the specific rates for firefighters compared to the general public:

- Testicular cancer: 2.02 times the risk (again: 100% = double = 2 times)
- Mesothelioma: 2.0 times greater risk
- Multiple myeloma: 1.53 times greater risk
- Non-Hodgkin's lymphoma: 1.51 times greater risk
- Skin cancer: 1.39 times greater risk
- Malignant melanoma: 1.31 times greater risk
- Brain cancer: 1.31 times greater risk
- Prostate cancer: 1.28 times greater risk
- Colon cancer: 1.21 times great risk
- Leukemia: 1.14 times greater risk

Need more evidence? The International Association of Firefighters (IAFF) and National Institute for Occupational Health & Safety (NIOSH) have also weighed in:

- Cancer caused 61% of the career firefighter line-of-duty deaths from January 1, 2002, to March 31, 2017, according to data from the International Association of Fire Fighters (IAFF). Heart disease caused 18 percent of career LODDs for the same period.
- Cancer caused 70% of the LODDs deaths for career firefighters in 2016.
- Firefighters have a 9% higher risk of being diagnosed with cancer and a 14% higher risk of dying from cancer than the general U.S. population, according to research by the CDC/National Institute for Occupational Health and Safety (NIOSH).

Prevention is an area the fire service has made great strides, but there is still work to be done. Many departments have implemented SOP/SOG's with varying levels of success. Numerous organizations have put in places standards or best practices, including the International Association of Firefighters (IAFF), National Fire Protection Association (NFPA), and the Firefighter Cancer Support Network (FCSN). In March of 2018, the National Volunteer Fire Council addressed this need by releasing their 11 best practices which are as follows:

1. Full protective equipment (PPE) must be worn throughout the entire incident, including SCBA during salvage and overhaul.

2. A second hood should be provided to all entry-certified personnel in the department.

3. Following exit from the IDLH, and while still on air, you should begin immediate gross decontamination of PPE using soap water and a brush, if weather conditions allow. PPE should then be placed into a sealed plastic bag and placed in an exterior compartment of the rig, or if responding in POVs, placed in a large storage tote, thus keeping the off-gassing PPE away from passengers and self.

4. After completion of gross decontamination procedures as discussed above, and while still on scene, the exposed areas of the body (neck, face, arms, and hands) should be wiped off immediately using wipes, which must be carried on all apparatus. Use the wipes to remove as much soot as possible from head, neck, jaw, throat, underarms, and hands immediately.

5. Change your clothes and wash them after exposure to products of combustion or other contaminates. Do this as soon as possible and/or isolate in a trash bag until washing is available.

6. Shower as soon as possible after being exposed to products of combustion or other contaminates. "Shower within the Hour."

7. PPE, especially turnout pants, must be prohibited in areas outside the apparatus floor (i.e. kitchen, sleeping areas, etc.) and never in the household.

8. Wipes, or soap and water, should also be used to decontaminate and clean apparatus seats, SCBA, and interior crew area regularly, especially after incidents where personnel were exposed to products of combustion.

9. Get an annual physical, as early detection is the key to survival. The NVFC outlines several options at www.nvfc.org. "A Healthcare Provider's Guide to Firefighter Physicals" may be downloaded from www.fstaresearch.org/resource/?FstarId=11591

10. Tobacco products of any variety, including dip and e-cigarettes should never be used at any time on or off duty.

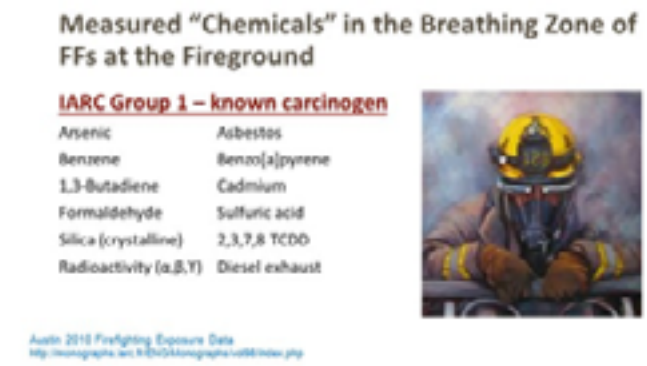
11. Fully document ALL fire or chemical exposures on incident reports and personal exposure reports.

This campaign highlights the growing awareness of the occupational firefighter cancer epidemic which has swept our country and does not discriminate based on department type. Firefighters in Paid-on-Call and combination departments are also facing cancer head-on, it's not limited to just career or full-time firefighters.

Even with overwhelming evidence and in-field education underway, the need for research continues. Scientists are committed to understanding this plague and reducing lives lost to occupational cancer. Dr. Kenneth Fent of the National Institute of Occupational Safety and Health (NIOSH) explains combustion products on the fireground and the "breathing zone" of firefighters, noting that firefighters are one of the only occupations still directly exposed to soot. Soot is a group one carcinogen (see chart below) containing PAH's-polycyclic aromatic hydrocarbons, which are toxic to humans.

The occupation of firefighting alone is classified as 2B by the IARC; possibly carcinogenic to humans as of 2010. IARC has made it a top priority to reevaluate firefighting within the next 2-5 years to determine possible re-classification of firefighting.

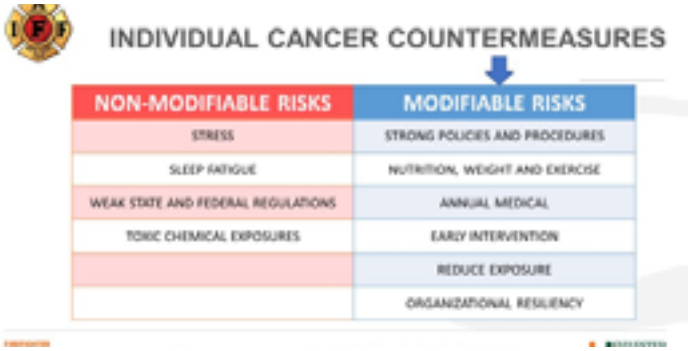
According to Dr. Fent, "We know of at least 12 measured chemicals and there is probably more than this on the IARC known carcinogen list."



2019 MIAMI CANCER SYMPOSIUM & MOVING FORWARD

Understanding the firefighter occupational cancer epidemic has been made easier with the facts and figures studied and presented by multiple sources. The question remains, what is new and cutting edge for continuing education, and how do we continue to improve the knowledge base within the fire service?

Statistically speaking, the firefighter mortality rate is still climbing. According to the IAFF, 65% of the line of duty deaths for IAFF members (2002-2018) are cancer-related. Over the last 5 years, 944 names have been added to theNational Fallen Firefighter Memorial Wall of Honor, and 685 died from occupational cancer. Of the total firefighters named to the Wall, 54.8% died from cancer. While the inherent risk factors of firefighting cannot be changed, there are changes any firefighter can make to reduce their risk of contracting cancer.



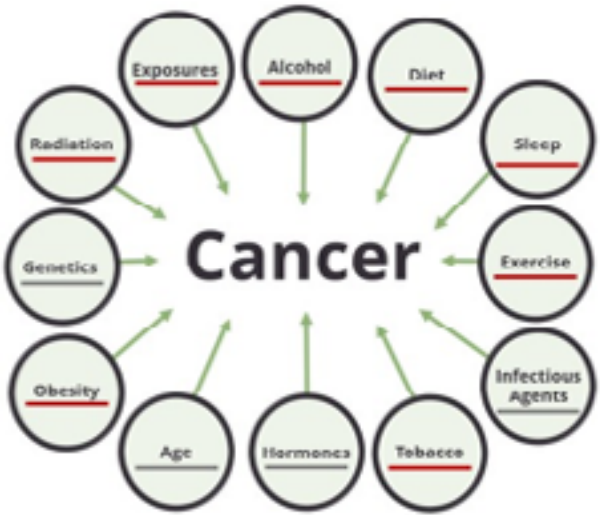
MODIFIABLE RISK FACTORS

Speaking to a some of the modifiable risks, Patrick Morrison, IAFF Assistant to the General President for Occupational Health, Safety & Medicine stated: "If there is not a fire department in this country that is doing annual medicals that is a shame. It is poor leadership and not understanding the issues. You are part of the problem." Truer words have never been spoken. Tools are available for change if fire service leaders are willing to lead the battle against occupational cancer. Questions demanding answers are:

- Does the department have the organizational resiliency needed?
- Does the organization understand the need?
- Are they willing to put policies and procedures together?
- Is the department supportive of the member and their families if they get sick?

Improvements have been made in other areas. Forty seven states now have cancer presumptive laws.

But is this enough when the laws are vague? About half of the states do not include volunteer firefighters, and the burden of proof for occupational cancer still rests on the firefighter, who is already battling this disease.



Dr. Laura Barger, an assistant professor with Harvard Medical School, is working to address the importance of sleep and effects of sleep deprivation on firefighters. Adults need 7-9 hours of sleep nightly. With a staggering 69% of Americans reporting insufficient sleep, it is not surprising that nearly 1 in 3 Americans sleep less than 6 hours nightly; a rate double what it was 50 years ago. Dr. Barger states, “Sleep is the third, often forgotten, pillar of health. People focus on diet and exercise but often overlook sleep.” Why does the body need sleep? Less than 6 hours of sleep is associated with increased risk of hypertension, heart disease and stroke. Sleep helps regulate appetite and metabolism. Weight gain, over-eating, and obesity all increase with less sleep. Additionally, immune system regulation is affected by sleep deprivation, with a depressed immune system also considered to be a cancer risk factor.

Fire department data reveals startling results. With 66 departments and nearly 7000 firefighters participating, the data found:

Firefighter Sleep Disorder Screening

- 6,933 firefighters in 66 departments
  - 40 ±9 years
  - 6% female
  - 20% ≥ 25 BMI
- 37.2% screened positive for a sleep disorder
  - 28.4% Obstructive Sleep Apnea
  - 6.0% Insomnia
  - 9.1% Shift Work Disorder
  - 9.1% Restless Legs Syndrome

More than 80% were undiagnosed and untreated

Barger LK, Rajaratnam SM, Wang W, O'Brien CS, Sullivan JP, Qadri S, Lockley SW, Czeisler CA; Harvard Work Hours Health and Safety Group. Common sleep disorders increase risk of motor vehicle crashes and adverse health outcomes in firefighters. J Clin Sleep Med. 2015 Mar 15;11(3):233-40.

Dr. Matthew Walker, author of the book Why We Sleep, discusses the power of sleep deprivation: "After just one night of only four or five hours' sleep, your natural killer cells – the ones that attack the cancer cells that appear in your body every day – drop by 70%." The problem with sleep deprivation is so acute that in 2007, the International Agency for Research on Cancer classified shift work with circadian disruption as a probable human carcinogen, the second highest rating the organization bestows.

Another modifiable risk for firefighters is the use and implementation of the clean cab concept, which is based upon designing apparatus' around firefighter safety, health and wellness. Coral Springs Parkland (Fla.) Fire Chief Frank Babinek states, "The basic concept is anything that goes into an IDLH environment does not belong in the cab with the exception of cleaned turnout gear." Only fully cleaned turnout gear is acceptable in the cab. Off-gassing SCBA's are not. At a bare minimum, decontamination must be performed after entering an IDLH environment. Whenever possible, departments should place as much firefighting equipment in outside compartments so that rigs are easier to decontaminate. Using a light-colored interior, with non-absorbent materials including vinyl seats, will also help the rig not absorb or hide particulates. Another easy change is maintaining a 2-flashlight system. Coral Springs uses a yellow flashlight mounted in the cab for medical calls, while the firefighting flashlight is stored in a compartment outside the cab with the other fire/IDLH tools. A policy should be put in place allowing for a designated deep-cleaning and decontamination of the cab on a monthly basis. Departments should create a standard operating procedure and enforce it. Lastly, according to Chief Babinek, modifying new rigs to the clean concept is cost effective, "This should not be a big cost differential, you are just reallocating the existing compartment space."

FIREFIGHTER CANCER REGISTRY ACT 2018

With the passing of the National Firefighter Cancer Registry Act of 2018, NIOSH is embarking on its most ambitious study to date. This study tasks the Center for Disease Control with establishing a National Firefighter Registry to track firefighter occupational health data. With the goal of voluntarily enrolling 200,000 firefighters, the CDC, NIOSH, and Dr. Fent plan on exploring and investigating multiple factors and how they relate to firefighter cancer risks. The registry has an anticipated rollout date of late 2020 or early 2021. NIOSH is anticipating accepting registrants in approximately one year (Summer 2020).

It is equally important to note the registry is open to all firefighters regardless of cancer status. The registry specifically is looking for larger participation from volunteer, female and minority firefighters. Dr. Fent could not overstate the importance of the registry and how it can impact firefighters in the future: "Let's all work together to try and reduce the excess risk of cancer in the fire service.[3]"

With the momentum gained by the 2019 Miami Cancer Symposium, our nation's firefighters are getting the resources needed to study this epidemic and create meaningful changes. While this process may not move as fast as the fire service communitymay like, it is true progress.

We must do our share and take part in the NIOSH Firefighter Registry. Being in the fire service, it is incumbent upon us not only to participate, but to lead wherever and whenever possible.

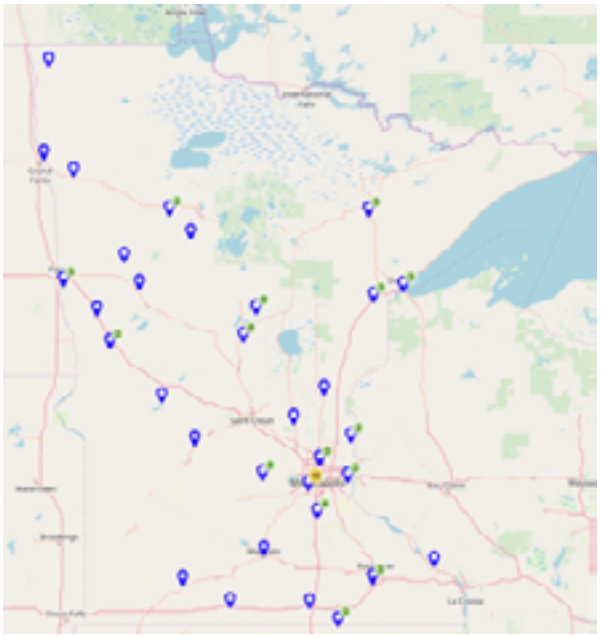
2018-2019 FSAC Grant Wrap Up

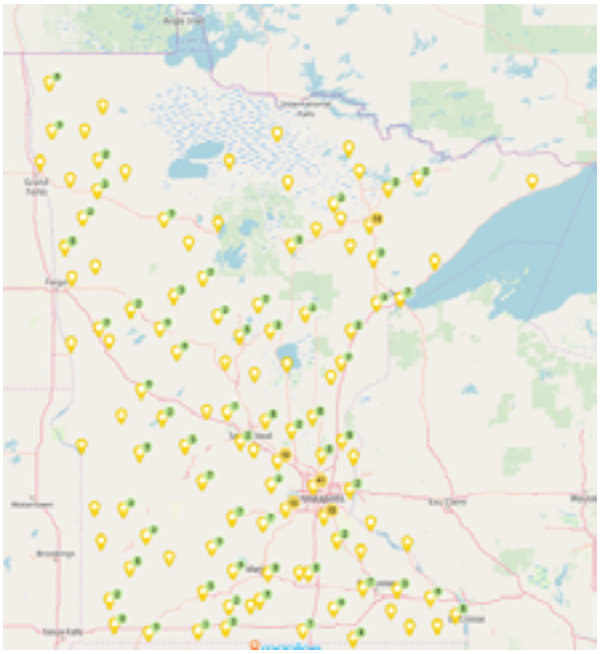
MnFIRE aggressively moved into the awareness training in 2018-2019, after receiving grant funding in September of 2018. MnFIRE had three quarters to get trainers trained and then get those instructors in front of fire departments.

Marketing was done through the Minnesota State Fire Department Association, the Minnesota Professional Firefighters Association and the Minnesota State Fire Chiefs Association. These marketing efforts included attending the conferences and schools hosted by these associations and providing training at those conferences.

In addition, the State Fire Marshal's Office shared training information through their mailing list and through the MBFTE.

Finally, instructors promoted the message after receiving the training and brought the message to their neighboring departments.





This map shows where the MnFIRE Awareness Training was delivered throughout the state.

INSTRUCTORS

MnFIRE held seven train-the-trainer sessions, training 126 instructors. Of those 126 instructors, 71 of them did training for reimbursement.

This graphic (to the right) shows where the MnFIRE Awareness Instructors were from.

All instructors will receive a 1099 for tax purposes.

CLASSES

These instructors were busy. Between October 8, 2018 and June 27, 2019, they instructed 480 classes at 389 departments. The MnFIRE Awareness training reached approximately 7,900 firefighters in Minnesota.

With these classes MnFIRE reached 80% of the original goal (600 classes), completing this in eight months.

MnFIRE takes great pride in the distribution of these classes throughout the entire state. The message of cardiac disease, mental health, cancer awareness and prevention is reaching firefighters across the state!

Comments from Classes

Sign in sheets were completed for each class and a survey was emailed out via Survey Monkey to each person who attended. Some comments are included below:

> ***"Zack did a great job. His pace was good, delivery of material was smooth and easy to understand, and he supplemented the materials with examples which always aids in understanding. Very informative and interesting. Great speaker!"***
>
> ***"Went well. Great to have an instructor that has been there and done that. One of us. Down to earth. Thanks."***
>
> ***"Keep providing it with updated information as it comes along."***
>
> ***"Very good class!"***
>
> ***"It was an excellent presentation and presented some real-world actions we can take to make our lives healthier and longer. I would absolutely recommend this presentation and presenter to any department!"***

At the very least, departments are now equipped with knowledge on how they can take better care of their firefighters and each other. The conversation has been started!

Financials

Instructor Fees:	$104,900.57
Program Mgt:	$50,000
Train the Trainer:	$26,927.05
Postage:	$5,328.97
Training Materials:	$19,106.86
Subscription Fees:	$1,210.00
Advertising/Marketing/Vendor Shows, etc.:	$15,313.37
TOTAL	**$222,786.82**

Wrap-Up

MnFIRE was able to make a significant impact in eight short months. The training was delivered 480 times to 389 different departments, reaching about 7,900 firefighters.

MnFIRE would like to continue the mission to finish the training for each department in the state and is exploring multiple avenues to get this completed.

Hometown Heroes Assistance Program

There is an escalating crisis in the Minnesota fire service – one that is costing our firefighters their lives. The high incidence of illness – particularly cardiac, cancer and mental health challenges – is alarming and requires an immediate response.

Critical funding shortages throughout Minnesota departments make it difficult for fire service leaders to prioritize firefighter health measures and equipment, and deeply impact departments and communities and the firefighter families who protect Minnesota's cities and towns.

More than 93% of all Minnesota firefighters are non-career volunteers, without an Employee Assistance Program (EAP). The fire service has identified critical missing pieces, including not being able to provide supplemental and preventative insurance and other resources for firefighters, EAP benefits, department-wide health checkups, gear-cleaning tools, mental health resources and other important support.

The three major health challenges facing Minnesota's fire community include:

Cardiac
Cardiovascular disease is the number-one killer of firefighters nationwide and is by far the leading cause of line-of-duty deaths in the fire service.

According to the International Association of Firefighters, more than 12% of all firefighters will develop heart disease at some point in their lives. Even young and healthy firefighters suffer from hardened arteries and impaired heart function after just three hours of prolonged firefighting, according to a 2010 study from the Illinois Fire Service Institute.

Cancer
Firefighters experience higher rates of certain types of diagnoses and cancer-related deaths compared to the general U.S. population, according to a multi-year study from the Centers for Disease Control and Prevention (CDC). More than 68% of all firefighters will develop some form of cancer in their lifetimes.

According to the National Institute for Occupational Safety and Health (NIOSH), firefighters have a 9% higher risk of being diagnosed with cancer and a 14% higher risk of dying from cancer.

The rate of line-of-duty deaths from cancer-related illness is rapidly increasing and is on pace to overtake cardiac disease as the leading killer of firefighters nationwide. Specific cancers related to carcinogen exposure – such as malignant mesothelioma – are more than twice as prevalent in firefighters than in the general population. The chance of lung cancer and leukemia diagnoses, and cancer-related death increases with the amount of time spent at fires.

Emotional Trauma
An abundance of recent research pertaining to firefighter health shows that those in the fire service experience much higher rates of mental health challenges than the general population – particularly in the areas of sleep disorders, depression, substance abuse, post-traumatic stress disorders and suicidal ideation and action.

In fact, research suggests that there is an association between the number of years of duty in the fire service and higher levels of suicidal ideation/action. According to the Journal of Emergency Medical Services (2015), first responders contemplate and attempt suicide at a rate 10 times higher than the general population.

The on-the-job bravery of firefighters is legendary, but that doesn't mean they should suffer in silence when facing occupational stress and emotional trauma – ignorance and lack of support from the fire service often makes emotional health concerns worse over time.

THE SOLUTIONS

The Minnesota Firefighter Initiative (MnFIRE) is dedicated to providing Minnesota's firefighters with the tools they need to prioritize and protect their health by focusing on the three health problems most commonly experienced by those in the fire service: cardiac, cancer and emotional trauma.

MnFIRE launched in 2016 as an innovative and inclusive approach to unify and spark conversations among firefighters, their families, their communities and state policymakers regarding firefighter health.

Protecting firefighter health starts with firefighters taking steps to take care of themselves, so they can continue protecting the communities they serve.

MnFIRE is actively working to mitigate this crisis by:

- **Training.** The organization is implementing a comprehensive health and wellness training initiative for all of the state's 22,000 firefighters

- **Support.** In 2018, MnFIRE launched a 24-hour peer support hotline for firefighters struggling with mental health issues. Help line call activity has increased 400% as a direct result of the MBFTE funded MnFIRE Awareness training which started in October 2018.
- **Information.** MnFIRE is leading the discussion with a concerted information campaign designed to reach firefighters, policymakers, media and the general public
- **Prevention.** This legislative session, the fire service is requesting $7.2 million from Minnesota's legislators to provide supplemental health insurance and Employee Assistance Program resources designed to deliver a significant return on investment for communities across the state – and to slowly edge Minnesota toward appropriate funding to support our hometown heroes.

TRAINING

Protecting firefighter health starts with firefighters taking steps to take care of themselves, so they can continue protecting communities and the fire service as a whole. Our state's firefighters are now moving in an important direction to protect themselves and their peers. MnFIRE has been awarded a grant to train every Minnesota firefighter to become "MnFIRE Aware" before June 30, 2019.

The organization is on a mission to train every one of the more than 700 Minnesota fire departments on what it means to be MnFIRE Aware, targeting the three main causes of firefighter death: cardiac, emotional trauma and cancer. MnFIRE is preparing hundreds of industry leaders to present a two-hour MnFIRE Awareness training to their peers and has begun to roll out the departmental training sessions across the state.

SUPPORT

For the last year, the Minnesota Firefighter Initiative has been working hard to reverse the trend of suicide among Minnesota firefighters. The organization launched a 24-hour peer support hotline for firefighters struggling with mental health issues in 2017. So far in 2019, the hotline has been active, generating the following results:

- Received more than 90 calls for service (more than 4x the pace from 2018)
- Some of those calls required critical mental health care/referrals to clinicians
- Calls have come from firefighters across the state

INFORMATION

Since its inception in 2016, MnFIRE has led the discussion about Minnesota firefighter health and the impact it has on our communities via a campaign designed to engage with firefighters and their families, departments, legislators, the general public and the media.

PREVENTION

The fire service is built on attracting and retaining the best people to become firefighters. MnFIRE is recognizing that a healthy work/life balance is critical for retention and career longevity.

Protecting firefighters from chronic illness allows the fire service to be most effective in protecting the communities it serves.

All public decision-makers – from the State Capitol to city halls – must make Minnesota fire service a funding priority, not simply to protect the lives and property of Minnesotans, but to give firefighters the help they need to stay healthy and optimally productive in service to their communities.

To that end, this legislative session, the Minnesota Fire Service is requesting legislation to fund the Hometown Heroes Enhanced Critical Illness Plan.

The Hometown Heroes Enhanced Critical Illness plan complements existing medical coverage and helps fill financial gaps caused by out-of-pocket expenses such as mortgage payments, college tuition, or treatment not covered by firefighters' medical plans. Benefits are paid regardless of what is covered by medical insurance. Payments are made directly to covered employees to spend as they choose.

In addition to providing coverage for cardiac, cancer and mental health issues, the plan provides a broader range of benefits - Employee Assistance Program (EAP) benefits provide coverage for non-career and volunteer firefighters, who are not historically covered by EAP programs.

National standards (such as NFPA 1500) recommend that all firefighters have access to behavioral health services, yet many departments don't have programs in place due to budget realities and other priorities. An Employee Assistance Program (EAP) is often provided through employer health plans, but because 93% of Minnesota firefighters are non-career, EAPs are often not available to them because of their part-time status. In addition, it's important to ensure that EAP assistance is firefighter-specific and responsive to the unique challenges they face.

Mental and emotional health is as important as physical health for firefighters, as a proactive mental health program can save fire departments significant time and money in the long run (not to mention the lives of brothers and sisters in the fire service).

THE HOMETOWN HEROES ASSISTANCE PROGRAM

(SF2264 and HF1782)

seeks to accomplish five key outcomes:

1. Provide a statewide “Critical Care” policy for all Minnesota firefighters which covers diagnoses of cancer or cardiac issues. Coverage amount is $30,000 per diagnosis.

2. Ongoing Annual MnFIRE Awareness training for every Minnesota firefighter. Changing the current culture in the Minnesota Fire Service is integral to long-term reduction of the incidences of cancer, cardiac and emotional trauma.

3. Additional EAP support for any firefighter who remains in need beyond the initial 5 treatment sessions.

4. Provide an Employee Assistance Program for all Minnesota firefighters targeting emotional trauma issues unique to the fire service. This program will provide up to 5 treatment sessions per firefighter.

5. Robust Annual MnFIRE Awareness Training for medical doctors and mental health doctors statewide around the unique impacts to firefighters with regard to cancer, cardiac and emotional trauma. In other words, creating centers of excellence statewide so that all firefighters in Minnesota have regional access to informed and trained medical professionals to help with prevention, mitigation, diagnosis and treatment of these issues.

Stand up for those who protect us every day.

FOR HELP, CALL:
888-784-6634

mnfireinitiative.com

#mnfireaware