

Firefighter Health and Wellness

Andy DiGiannantoni

University of Cincinnati

Certification Statement

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

X Andrew DiGiannantoni

Table of Contents

Certification Statement.....	2
Abstract.....	4
Cancer.....	4
Fitness.....	10
Mental Health.....	12
Sleep Deprivation.....	13
References.....	14

Abstract

A firefighter's number one priority should be their health and wellness. We cannot help those in need unless we take care of ourselves first. Firefighting is a very demanding profession both mentally and physically. It demands us to stay physically fit and train constantly. So when someone is having an emergency and needs assistance, we are functioning at our best. And we must be at our best for 24 hours and be prepared for anything at anytime. But, it is the job of a firefighter that exposes us to hazards and peril. Cancer, respiratory disease, mental illness and sleep deprivation are some of the risks we are faced with.

Cancer

Cancer has become one of the leading health risks for firefighters. "According to the [International Association of Firefighters](#), cancer has surpassed heart disease as the leading cause of death among firefighters" (Shaffer, 2019). Firefighters have a much greater chance of being diagnosed with cancer than the general public. Firefighters are exposed to a vast number of carcinogens while fighting fire. "Thirty years ago, asbestos posed the biggest cancer threat to firefighters. Now, it's cancers such as myeloma, non-Hodgkin lymphoma and leukemia" (Shaffer, 2019). These cancer causing agents are released into the air when building materials, furniture and other miscellaneous contents are burning. These materials used to be made from natural fibers such as real wood and cotton. Now they are more commonly produced from synthetic engineered materials. "There are approximately 1.1 million volunteer and career firefighters in the US. During firefighting activities, these workers may be exposed to many known carcinogens (eg, polycyclic aromatic hydrocarbons (PAHs), formaldehyde, benzene, 1,3-butadiene, asbestos and arsenic) in volatilized combustion and pyrolysis products or debris"

Firefighter Health, Wellness and Fitness

(Daniels, Kubale, Yiin, Dahm, Hales, Baris, Waters, Pinkerton, Zahm, Beaumont, 2014). In order to combat this relatively new threat, fire departments have developed new strategies and tactics to reduce exposure and increase firefighter safety.

Firefighters are subjected to carcinogens while fighting fire through three main routes. The harmful substances can be inhaled, ingested or absorbed through the skin. Firefighters inhale and ingest carcinogens when they are not wearing a self contained breathing apparatus (SCBA) during firefighting activities. Also an ill fitting mask can make a firefighter vulnerable to a toxic atmosphere. It is important for fire departments to provide a properly fitting mask to each of its firefighters. This can be difficult for some departments due to the cost involved. I used to work for a small combination fire department that supplied one medium size SCBA mask per seat on each fire apparatus. Of course SCBA masks are not one size fits all, this was an unacceptable practice. That same fire department only supplied its full-time firefighters with turnout gear that was fitted to them. Part-time and volunteer firefighters had to wear older gear that was not tailored to their individual size. Firefighter personal protective equipment (PPE) is very expensive, but it has a very important job of protecting those who wear it. Fire departments need to provide properly fitting gear for each and every one of its firefighters.

There has been change over the years concerning wearing an SCBA. Firefighters have been aware that donning an SCBA during fire attack is a necessity. However, there are still times when an SCBA is not utilized when it should be. Overhaul is one of these times. During this phase, most if not all of the flames have been extinguished. However there usually is still smoldering debris and off gassing from what was burning. At this point, the excitement and adrenaline from fighting the fire is over, causing some firefighters to 'downgrade' their PPE. This is a hazardous practice that makes you vulnerable to toxic inhalation. Also, firefighters may

Firefighter Health, Wellness and Fitness

underestimate a safe distance to stage from the fire scene. Often time's firefighters that are waiting to work or are in rehab, are too close and they risk being exposed to smoke. Preferably you want to be upwind and at a safe distance. Another reason an SCBA might not be worn during overhaul is a lack of full spare SCBA bottles. Some fire apparatus only carry one extra bottle for each seat on the truck. Firefighters could find themselves not having enough bottles on a large fire that is time consuming. Nevertheless, there are ways around this. Whoever is in charge can arrange extra bottles brought to the scene. It is worth the time and effort to ensure the safety of the firefighters on scene. My fire department has a standard operating guideline (SOG) that states firefighters must don an SCBA and be 'on air' during all phases of firefighting and when in close proximity of the fire when exposure is possible.

The other main route of exposure to carcinogens is absorption. Firefighter turnout gear including coat, pants, helmet, boots, and hood, gloves, SCBA and mask become covered in soot, containing cancer causing substances from fighting fire. Today firefighters are aware of the health risks from not maintaining clean turnout gear. The days when dirty charred gear was a sign of experience is behind us. Decontamination is an important step in minimizing the risk of your body absorbing the harmful substances. Post firefighting decontamination should occur as soon as possible. I always have a bag containing an extra hood, pair of gloves and t-shirt with me on whatever fire apparatus I am assigned to. This allows me to change out of some of my contaminated gear and clothing on scene before I get back to the station. Once back at the station, I will borrow another firefighter's clean gear that is not being used. Unfortunately my department has not provided each member with two sets of turnout gear. That is the best practice; however borrowing clean gear is better than continuing to wear contaminated gear throughout the remainder of your shift. Then I will separate my turnout gear and place machine

Firefighter Health, Wellness and Fitness

washable items into our extractor. The other pieces of gear are hand washed. My department requires its members to document in a log every time our turnout gear is washed. Once I am done handling my dirty contaminated gear, I will then take a shower and put on clean clothes. These decontamination practices are department policy and not voluntary. Contracting cancer through absorption following fire fighting is a serious risk. My department also does not allow turnout gear, whether clean or dirty to be brought into the living quarters of the station. It must be stored in the gear room or placed at your assigned truck. When a firefighter attends training outside the department, there gear must be stored outside the passenger cabin of their car and placed inside a bag. For example, gear can be placed inside a closed garbage bag and then put inside the trunk of a car.

Another aspect of cancer prevention in the fire service is a change in tradition. The fire service has a long history of proud traditions. However not all traditions are good ones, and fire departments need to reflect on current practices. Fire chiefs, officers and senior firefighters need to lead the way in incorporating changes that protect firefighters from cancer. Firefighters are noble in that they are willing to put themselves in harm's way at a moment's notice at anytime. However this can make us vulnerable and so we must mitigate the risk. Firefighters can do this by taking the initiative to eat right and exercise. Maintaining a high level fitness and being healthy is a good defense against illnesses.

The number of firefighters diagnosed with cancer is staggering. It is truly an epidemic that demands immediate action. "Firefighters have a 9 percent higher risk of being diagnosed with cancer and a 14 percent higher risk of dying from cancer than the general U.S. population, according to the NIOSH study results" ("Firefighter Cancer Support Network", 2017). This has led state law makers to introduce presumptive cancer legislation. The legislation recognizes the

Firefighter Health, Wellness and Fitness

increased rates of cancer in the fire service and allows firefighters with cancer to qualify for workers compensation benefits. It assumes that when a firefighter has been diagnosed with cancer, it was due to exposure from the duties of being a firefighter. The burden to prove otherwise is placed on the employer. In the past, firefighters could be forced to retire from the service and be responsible for expensive medical bills. Also, now the death of a firefighter from cancer would be considered a line of duty death. “Earlier this year the fire service made a huge step in presumptive legislation on the federal level. The Firefighter Cancer Registry Act (HR931) was signed into law by President Donald Trump on July 7, 2018, marking significant progress by the fire service, lobbyists and lawmakers to recognize the impact of occupational cancer in the fire service. This law will require the Centers for Disease Control (CDC) and Prevention to develop and maintain a voluntary registry collecting data on the incidence of certain cancers in firefighters (“Presumptive Legislation for Firefighter Cancer”, 2018)”.

Each state that has cancer presumptive legislation has different qualifications for coverage and the types of cancer recognized as work related varies. We are fortunate to have cancer presumptive legislation in Ohio. The presumptive legislation became effective in 2017 and was designated Senate Bill 27 and carried the namesake of “Michael Louis Palumbo, Jr. Act.” It allows firefighters who have been diagnosed with cancer to file a claim with the Bureau of Worker’s Compensation (BWC). The presumption is that the cancer is a work related illness. However in some states, only certain types of cancer are covered and if an employer can prove a firefighter’s lifestyle contributed to them developing cancer, they might not be covered under the presumptive cancer act.

“In 2017, Ohio became the 35th state in the country to have cancer presumption legislation for firefighters. ‘The Michael Louis Palumbo Jr. Act’ provides that a firefighter who is disabled as a

Firefighter Health, Wellness and Fitness

result of cancer under certain circumstances is presumed for purposes of the laws governing workers' compensation and the Ohio Police and Fire Pension Fund (OP&F) to have incurred the cancer while performing official duties” (Luzzi, 2017). Captain Michael Louis Palumbo, Jr. was married and a father of five. He worked for the Beachwood Fire Department located in Beachwood, Ohio and was diagnosed with brain cancer that was determined to be caused by his years of exposure to hazardous substances as a firefighter. Captain Palumbo became an advocate for presumptive cancer legislation in the state of Ohio and Senate Bill 27. He helped bring attention to this important cause by making his diagnosis public and sharing his personal struggles with his illness. He educated firefighters of cancer awareness and was a motivational figure. Captain Palumbo got to witness the bill get signed into effect by Governor Kasich, but unfortunately he lost his fight with cancer and died later that year. The single most important thing a fire department can do to support claims of a work place cancer diagnosis is data collection. “Data collection is the foundation of presumptive cancer legislation. If there is to be a means of improving firefighter safety nationally, fire departments must start by participating in data reporting, beginning with the National Fire Incident Reporting System (NFIRS)” (Ford, 2017, p. 171). My department requires each of its firefighters to complete an incident exposure report following exposure to a possibly hazardous substance. Since many of the substances that firefighters are exposed to are unknown, we must fill out an exposure report after every time we fight fire. The form gathers information such as; known substances, type of exposure and duration of exposure. The information is also documented in a NFIRS report by a fire officer. “The NFIRS is administered by the National Fire Information Council and the United States Fire Administration (USFA), largely though volunteer efforts on behalf of participating departments” (Ford, 2017, p. 179). “A NFIRS report is done on a voluntary basis and its database only

Firefighter Health, Wellness and Fitness

contains reports on about half of all national incidents” (Ford, 2017, p. 179). All fire departments should be documenting the exposure of its firefighters. In some states for a firefighter to qualify for presumptive cancer they have to have a minimum number of years of service in a position where they were exposed to hazardous substances. The information gathered in these reports and other forms of data collection, is important not just for the members of a single fire department but the fire service as a whole. It allows for the observation of positive and negative trends across the board. Fire departments need to learn from each other to prevent foreseeable harmful consequences.

Fitness

A firefighter’s level of fitness affects their job performance and their longevity in the fire service.

Firefighters have one of the most physically demanding jobs. It can require every ounce of strength and energy you have. Firefighters must train and workout to be prepared for the worst, because we never know what to expect. It is impossible for a firefighter to know what the physical demands of the day might be. If a firefighter is not physically ready, they can fail to perform or be a burden on their fellow firefighter. They may even suffer a medical emergency and die from overexertion. As a firefighter ages they become more susceptible to overexertion and medical emergencies. It is easy to become complacent and lose focus on your health and wellbeing. But we should be doing the opposite, and take our health more seriously as we get older. Statistically, a firefighter’s chance of suffering from heart failure increases with age, while simultaneously the odds of dying from a traumatic incident decreases.

My fire department has implemented several policies in order for its firefighters to maintain an acceptable standard of fitness. All firefighters and officers are required to work out a minimum

Firefighter Health, Wellness and Fitness

of 45 minutes during a 24 hour shift. The work out may be a combination of weight lifting, cardio and stretching. My station has a physical therapy room that consists of several resistance machines, dumbbells, treadmills and stationary bikes. We are free to create our own workouts and train alone or with a group. Acceptable times to workout are after our afternoon training or after dinner. Most of the personnel are self motivated to work out and enjoy doing it. However there are some that lack motivation and intensity during their work out. GTFD has looked into bringing in a personal trainer or someone that would provide workouts to an entire crew and make recommendations on an individual basis. Some of the nearby fire departments have hired personal trainers to develop training programs for their firefighters. There is also a department that has a yoga instructor come to their station and teach yoga. The fire chiefs of these departments are aware of the importance of health and wellness and have embraced new training and conditioning methods.

GTFD requires it's firefighters to successfully pass an annual physical agility test and an annual medical examination which includes achieving at least 10 METS during a cardiac stress test. Also we have blood work done, a tuberculosis test and a head to toe examination by a physician. It is a requirement to pass the physical agility test and cardiac stress test, if a firefighter fails the tests; they are allowed to retake it. But successful completions of the tests are mandatory in order to maintain employment. GTFD also has an annual physical incentive test which consists of pushups, sit-ups and a mile and a half run. Participation in this test is optional and is not punitive. The amount of money a firefighter receives for taking the test is dependent on how well they do. It is a fun way to motivate personnel to stay in shape. My department also does not allow the use of tobacco on fire department property. Although the no tobacco policy is habitually violated by a few individuals.

Mental Health

Firefighters and emergency medical services (EMS) workers have a stressful job where they see traumatic events on a regular basis. These brave men and women witness pain, sadness and sorrow. It is only natural for firefighters and EMS to be emotionally affected by these events. In some cases it can lead to sleep deprivation, emotional outbursts, self destructive behavior, isolation and suicide. “More firefighters died by suicide than in the line of duty in 2017. A study found those 103 firefighters and 140 police officers died by suicide in 2017 compared to 93 firefighter and 129 officers’ line-of-duty deaths.”(FireRescue1 Staff, 2018) First responders are dealing with depression and post traumatic stress disorder (PTSD). In most cases they are not seeking treatment because they are either not aware of the signs and symptoms or they are afraid to appear weak or be ridiculed by their peers. In the past, the fire service has had a stigma surrounding mental health disorders. Firefighters were left to deal with their issues themselves and they could not turn to their fire department for help. Thankfully, now there are employee assistance programs available to firefighters and the stigma is almost none existent. If a fire department claims to be concerned with the well being of its firefighters during a fire, they need to also be concerned with their mental health. It cannot be ignored any longer; changes need to be made now.

The fire department I work for has employee assistance programs available to its firefighters and all of the fire officers and chiefs have an ‘open door’ policy when we need to talk. Also, during our annual physical examination, we fill out a brief questionnaire concerning mental health. However, it is just a few questions and we are examined by a physician who does not specialize in mental health. In my opinion I think we need to meet with a mental health professional at least once a year. I believe awareness and an early diagnosis followed by treatment as soon as possible

Firefighter Health, Wellness and Fitness

should be our goal. There is room for improvement at GTFD concerning the mental health treatment options for its firefighters.

Sleep Deprivation

Firefighters work long shifts; typically 24 hours or more and when they are on-duty, they have no control over the number of runs they take. This can be physically demanding and does not always allow for quality rest and whatever sleep a firefighter does get, it is often interrupted.

That is why a firefighter customarily will have 48 hours off-duty to rest between shifts.

Nonetheless, it is common for firefighters to work a part-time job when they should be resting.

I work 24 hours on-duty and 48 hours off-duty. My department takes about 2,000 runs a year. There are some nights when we do not take any runs, but most of the time we will take at least one. Firefighters are allowed to go to sleep at 22:00 and we are expected to be up at 06:30. Also we are lucky to have our own rooms that we share with the other 2 shifts. This makes it a lot easier to sleep compared to a large bunkroom where everyone has to sleep together.

Sleep deprivation should be taken seriously. It is responsible for numerous motor vehicle accidents, including accidents caused by first responders while responding to emergency calls. The public demands us to be at our best and we must do everything in power to be rested at the start of our shift.

References

Daniels, D. R., Kubale, T. L., Yiin, J. H., Dahm, M. M., Hales, T. R., Baris, D., Zahm, S. H., Beaumont, J. J., Waters, K. M., Pinkerton, L. E. (2014). [Mortality and cancer incidence in a pooled cohort of US firefighters from San Francisco, Chicago and Philadelphia \(1950–2009\)](#).

[Occupational & Environmental Medicine](#), Volume 71, Issue 6. Retrieved from <https://oem.bmj.com/content/71/6/388.full>

(2017). [Firefighter cancer fact check](#). [Firefighter Cancer Support Network](#), Retrieved from <https://www.firefighterclosecalls.com/wp-content/uploads/2017/06/FF-Cancer-Fact-Sheet.pdf>

(2018). [Presumptive Legislation for Firefighter Cancer](#). Retrieved from <https://www.firstrespondercenter.org/cancer/toolsresources/presumptive-legislation-firefighter-cancer-state/>

Luzzi, P. (2017). [Ohio Legislative Service Commission, Final Analysis](#). Retrieved from <https://www.legislature.ohio.gov/download?key=6297&format=pdf>

Ford, T.M. (2017). Fire and Emergency Services Safety and Survival

FireRescue1 Staff. (2018). Study: [More firefighters died by suicide than in the line of duty in 2017](#). Retrieved from <https://www.firerescue1.com/fallen-firefighters/articles/379994018-Study-More-firefighters-died-by-suicide-than-in-the-line-of-duty-in-2017/>

Shaffer, R. (2019). [Cancer Leading Cause of Death in Firefighters](#). Retrieved from <https://www.worksitemed.com/firefighter-cancer/>

Andrew DiGiannantoni
digianaj@mail.uc.edu
614-519-0846