

Firefighting Fatalities

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Background

Firefighting is considered to be among the most dangerous professions globally, thus firefighters face a high risk of death while on duty attending to fire emergencies. Most firefighting fatalities are attributable to cardiovascular problems. All individuals in organized fire departments with assigned duties of fire suppression as well as other non-fire related emergencies make up the umbrella of firefighters. Occupational hazards are the leading cause of firefighters' deaths, with sudden cardiac events at the forefront. On-duty instances that may trigger fatalities include any operations at the scene of an emergency, such as during training, maintenance, public education and inspection, during a response to an emergency, returning from a fire incident, or when attending to any other official duty. On-duty hazards exclude instances when a firefighter experiences fatal injuries when at home unless it happens while preparing for an emergency response or shortly after arriving home after an emergency response. Incidents are considered on-duty if the fatalities were sustained or induced when the firefighter was on duty. During firefighting and rescue duties, it is likely for firefighters to experience a combination of risk factors such as stress, physical exertion, intense heat and exposure to pollution.

It is inevitable that firefighters experience stress during their line of duty. In as much as the stress motivates them and alleviates their performance, too much exposure to stress over a long period of time tends to adversely affect their body as well as their mind. According to the Firefighter Fatalities in the United States in 2016 report (2017), the highest number of deaths occurred after response emergencies, while those occurring on the scene of fire followed. While it might be believed that deaths occurring during fire ground activities are caused by burns and

smoke due to the close proximity to open flames, contrary to this, sudden cardiac events are a leading cause of firefighter deaths in the line of duty. The Chicago Fire Department, CFD, has designed a policy to curb firefighting fatalities. This policy aims to run a risk assessment based on cardiac deaths related to firefighting operations, and measures to mitigate them.

Risk Assessment

While underlying problems are responsible for heart conditions, exposure to extreme stress associated with firefighting activities speeds up cardiac events among firefighters with existing conditions. The intense activities also expose others with unreported cases of heart conditions to high cardiac event risks. These activities include heavy muscular exercise activities, exposure to smoke and soot particles, exposure to extreme heat and disrupted sleep patterns due to an emergency occurrence at any time, all of which cause an adrenaline surge that in turn challenges the cardiovascular system in response to the emergency. Exposure to high temperatures may lead to blood pressure problems, a catalyzing factor of cardiac arrest. Firefighters wear heavy gears which increase their workload as well as impairing the body's ability to dissipate heat. During exposure to heat, the heart reacts by diverting most of the blood to the skin to help in cooling down the body (Christopher, 2011). This lowers the blood pressure after the emergency response, thus an individual with an underlying heart problem is susceptible to experience a cardiac event leading to sudden death.

Intense temperatures also lead to an increase in hemoglobin, a protein present in the red blood cells that are responsible for blood clotting as the body loses water, consequently leading to a concentration of the blood increasing blood viscosity and therefore, a high risk of stroke. As the Chicago Fire Department, CFD, measures are put in place to raise awareness and provide specialized care after a firefighting operation. These include immediate rehydration as well as

maintaining a good level of fitness and engaging in active cooling activities. Medical practitioners are stipulated to pay attention to firefighters and ensure that individuals with signs of heart conditions do not engage in strenuous firefighting duties. With these measures, it is possible to prevent and reverse a cardiovascular issue following an intense physical activity related to a firefighting emergency.

The firefighting profession requires an immediate response to an emergency regardless of the time of day, hence a firefighter's biological clock is often disrupted whenever a shift begins. Consequently, the body is unable to regulate an individual's sleep-wake system (Masri, 2018), slowing down the metabolic rate. According to Masri (2018), our bodies respond to environmental changes and anticipates them. Therefore, the body is able to respond to the light and dark of the daily cycle of 24 hours, further working in tandem with the other. With this in mind, sleep is therefore essential in helping the body recover from fatigue and stress. Thus, insufficient sleep leads to decreased metabolism and stress, consequently precipitating weight gain, a contributing factor to various conditions such as diabetes, obesity and heart problems. Although it is recommended that every fire department carries out duty criteria fitness and medical examinations to rule out such conditions, most firefighters fail to receive these examinations. According to a study carried out by the American College of Cardiology (2012), there exists a direct connection between sleep and a higher chance of heart attack as well as stroke. Thus sleeping not less than six hours is necessary to reduce the risk of heart problems and other related diseases.

Fire suppression operations are often preceded by an alarm. The alarm response triggers an adrenaline reaction known as "fight-or-flight" (Smith, 2016) which causes a continuous state of arousal until arrival at the emergency scene. This state results in an increased blood rate as

well as blood pressure. In addition to this, fire suppression activities at the scene require a lot of energy in exertion such as handling heavy machinery in order to ventilate a blazing building, operating fire hoses and climbing ladders. This is often in addition to their heavy encapsulating protective gears. This strain furthers cardiovascular problems and may cause dehydration and hyperthermia (Smith, 2013).

Often, firefighters are faced with exposure to traumatic stress challenges. Over time, they are prone to both physical and mental strains affecting their well-being. These strains may lead to problems such as post-traumatic disorders and in extreme cases, inflammation of the body due to exposure to traumatic stress. Even though firefighters quickly adapt to the traumatic stress experienced, the adverse effects of the exposure remain adamant within the body of the affected individual. Over a period of time, inflammation of the body poses as a high-risk factor of a cardiac event for the exposed individuals. Prolonged firefighting operations harden arteries, hence impairing the heart functions even in young and vibrant firefighters (Christopher, 2011). Such individuals are susceptible to elevated blood pressures as well as cholesterol and therefore, increased risk of a heart attack. The nature of the firefighting profession can highly impact firefighters' health even though they fail to exhibit physical or mental signs of an underlying condition. Individuals who have no regard for the importance of both mental and physical fitness have a higher prevalence of acute cardiovascular disorders. To help combat stress, intervention strategies such as fitness exercise, proper cooling activities, yoga, and other beneficial health activities should be integrated during the training of every firefighter at the start of their careers.

Risk Management Policy

Among other measures, the Chicago Fire Department has designed a guideline to help curb the adverse risks of cardiovascular problems associated with fire suppression operations.

These include limiting the exposure duration of each individual, effective rehydration both during and after a firefighting operation, and the involvement of medical examiners to keep a record on each one of the firefighters in order to regularly monitor their health. Even though these measures would go a long way in achieving a significant reduction in firefighting fatalities, they would not be appropriate approaches if other equally significant measures are not adhered to. These include fitness and wellness programs that promote healthy diets, banning the use of harmful substances such as tobacco, and advocating for indispensable retirement for all individuals at a certain age.

At the start of a firefighting career, it is imperative that proper training, health awareness and medical examinations are carried out prior to an actual engagement of an emergency response. The Chicago Fire Department is well equipped to provide these preventative measures to all its firefighters. These preventive measures will identify individuals with coronary heart conditions as well as the risk factors of this condition. While it is important that medical examinations are carried out, carrying out tests so as to identify abnormalities in the heart such as increased wall thickness and enlarged hearts will provide a much broader spectrum to handling cardiovascular fatalities as well as preventing their occurrence in the future. Annual physical examinations with complete blood work are also substantial in order to monitor firefighters' health after a period of exposure to some of the risk factors of cardiac events. Health awareness requires a change of lifestyle among firefighters. This includes the control in cholesterol levels and blood sugar, control in smoking habits, promoting a healthy diet, and control in weight gain, among others.

Even though overworking is inevitable in a field such as the firefighting department, the Chicago Fire Department employs multiple personnel in order to make sure that firefighters are

not overworked. This approach curbs the issue related to emergency response by individuals who are off duty, hence firefighters in this department experience minimum exhaustion and fatigue.

In situations where the duration of fire suppression is prolonged, there are substitute firefighters that assist in firefighting operations. The demand to employ more firefighters has increased since firefighters not only respond to fire-related emergencies, but also receive all types of emergency calls. Further, the CFD listens to concerns of firefighters and provides resources they might need, such as counseling. This department also ensures that each of the firefighting operations has insurance programs put in place to handle any need that may arise. These insurance programs serve both the paid and volunteer firefighters as well as the emergency medical respondents and offer them benefits alongside handling emergency situations. This is because in so doing the responders risk their lives to generously serve others. The purpose of these insurance programs is to provide financial protection in the case of an accident, provide a lifetime of disability benefits to an individual who sustains disabling injuries during an emergency response and psychological assistance programs for individuals and their families with issues regarding stress, grief, addiction, etc.

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