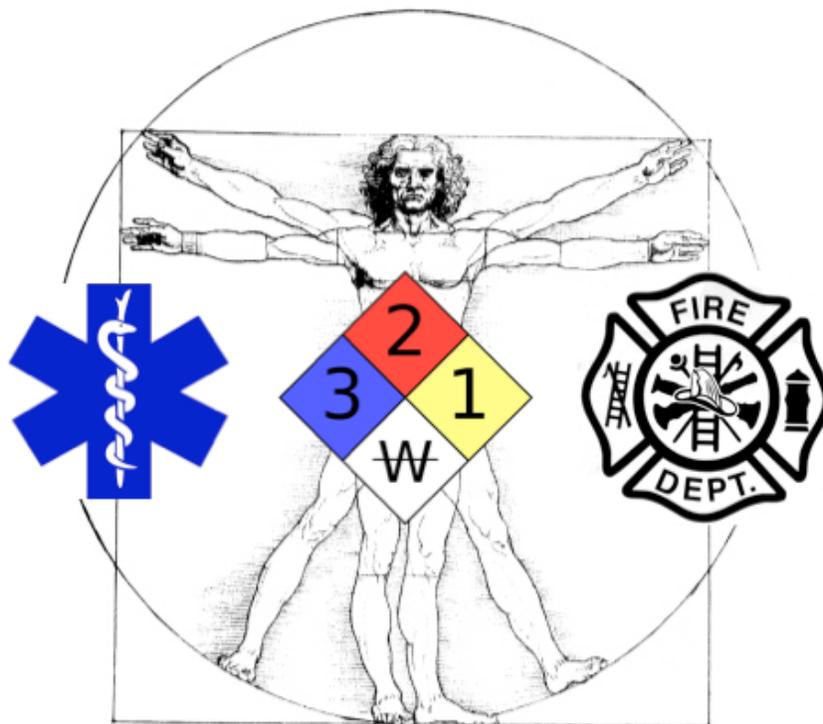

Do you have enough heart?

A review of Electrocardiographic Responses During Fire Suppression and Recovery Among Experienced Firefighters. Original article written by: S Al-Zaiti et al. Journal of occupational and environmental medicine 2015 (in press).

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www.firefighterresearch.org

Introduction

Heart attacks are the most common cause of line of duty deaths among firefighters and are likely related to the high physical demands associated with fire suppression and the generally low physical fitness among firefighters. A study conducted in the early 1970s reported that heart rates during fire suppression were very high for an extended period of time. This study used state of the art ambulatory 12-lead ECG to measure heart rate during a training fire among a group of experienced firefighters.

What the study did

Researchers from the Emergency Responder Human Performance Lab placed the Holter monitors on 42 firefighters who had been examined by a physician and screened with an exercise stress test. The firefighters were fit and averaged 31 years of age. They were considered to be at very low risk for heart disease. The firefighters were randomly assigned to complete two or three bouts of fire suppression and simulated ventilation before entering the rehab sector. The Holter files were downloaded and examined by an expert in ECG analyses.

What the study reported

Most firefighters (71.4%) exceeded the maximum heart rate they achieved during their exercise stress test. Heart rate was sustained above 150 beats per minute for an average of 38 and 54 minutes during fire suppression and rehab in the 2- and 3-work-period groups, respectively. More concerning, eleven firefighters exhibited pathological ST events on the ECG during fire suppression and another two firefighters developed the same finding during rehab. Nearly one third of each of these abnormalities persisted throughout recovery period. Three firefighters had frequent PVCs including ventricular trigeminy. Longer fire suppression intervals did not affect the incidence of these abnormalities.

What it means for the fire service

Although every firefighter understands the structural firefighting requires both strength and endurance, the true magnitude of the stress on the heart has not been appreciated. *This study provides direct evidence for the need for firefighters to maintain high aerobic fitness.* Significant aerobic exercise is required to maintain a heart above 150 bpm for an extended period of time. Fire departments that accept lower fitness standards for entry level or continuing firefighters may ultimately hurt their staff if they cannot perform their duties or suffer heart attacks.

The ECG abnormalities are particularly concerning given the low fitness of many firefighters. These findings may be trivial, or at least tolerated, by fit firefighters but could result in a fatal heart attack or arrhythmia in an overweight or sedentary individual.

