Only the strong survive (maybe)

A review of *The association of aerobic fitness with injuries in the fire service* ***Original article written by:*** GS poplin et al. American Journal of Epidemiology 2014 Jan 15;179(2):149-55.

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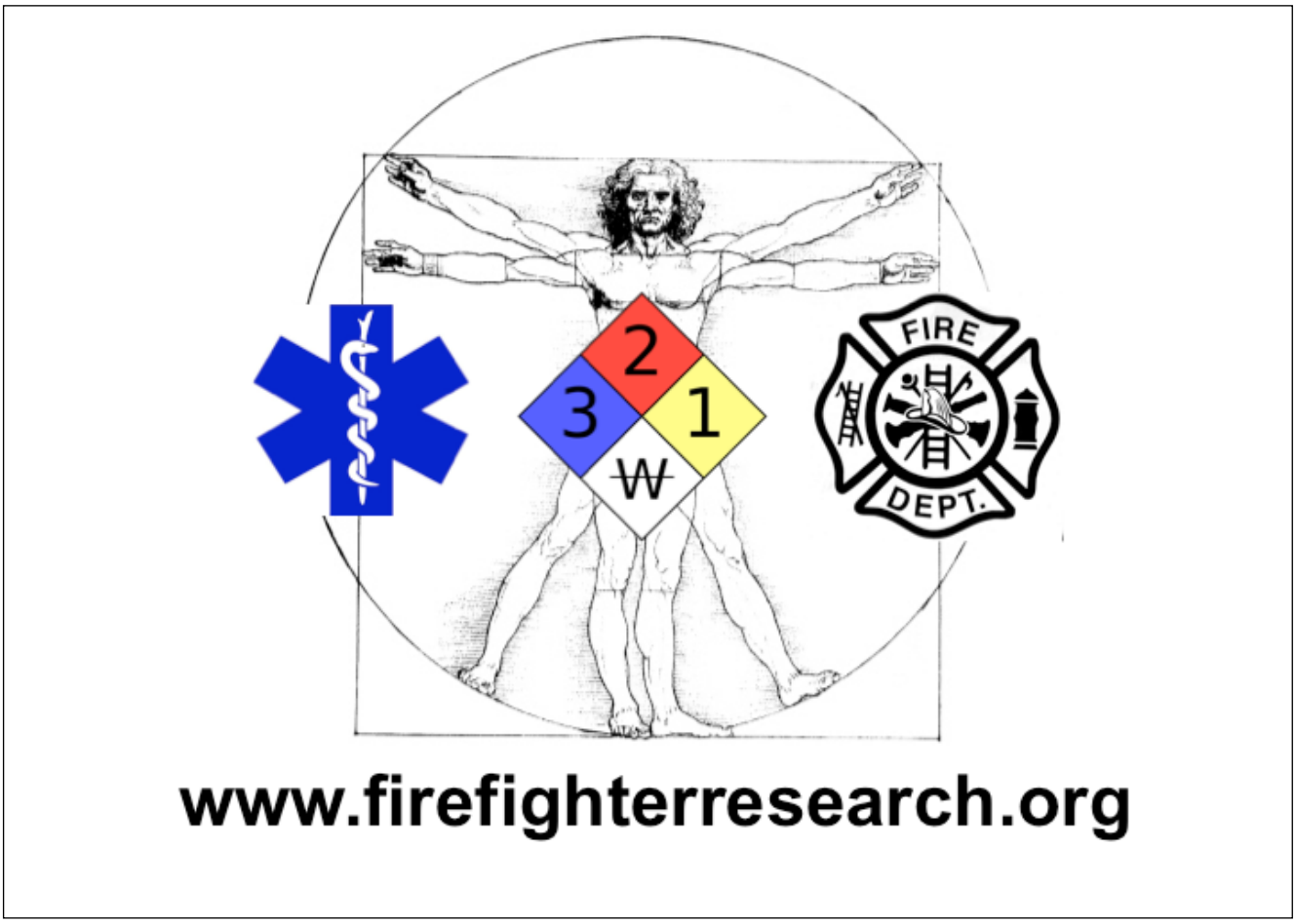

Introduction

Is it better to have a strong back or a strong heart when performing firefighting duties? Anyone faced with dragging 165 lb rescue manikin across the bay floor or hauling rolls of large diameter hose up to the fourth floor of the tower will tell you that it is better to be big and strong but is that the best protection against injury on the fireground?

If we assume that “fitness” refers to cardiorespiratory capacity, there are a limited number of potential scenarios to being very fit on the fireground. Very fit firefighters use less breathing air from the SCBA cylinder while they are working. Since more cylinder time gives you more opportunities to be injured, the fittest may suffer injuries at high rates. Conversely, the fittest individuals are often healthier in many ways and may be less likely to suffer an injury when compared to their less fit colleagues.

This month we look at a NIOSH-funded study from the University of Arizona that describes the relationship between fitness and line-of-duty injuries in firefighters.

What the study did

Tucson Fire Department (AZ) requires annual physical examinations and fitness tests for all uniformed firefighters. The investigators examined five years (2005 – 2009) of the fitness records and matched those records to the fire department injury logs. Aerobic capacity (VO_{2max}) was measured annually with a treadmill test and the results divided into low, medium, and high fitness. Injuries were included if they were reported to OSHA or if they were deemed minor but recorded internally because of the potential to progress to an insurance claim (e.g. due to cumulative or repeated trauma). Stroke, heart attack, heat illness, and other serious medical issues were not included.

What the study reported

In total, 773 injuries were reported in the study period. Sprains and strains accounted for 67% of all injuries and 38% of injuries resulted in lost time on the job. *The least fit were 2.2 times more likely to be injured in the line of duty when compared to the fittest firefighters and 1.38 times more likely to be injured than the medium fit group.* Firefighters were more likely to be injured if they had more body fat and if they were less than 30 years of age. Firefighters over the age of thirty were less likely to be injured but were also more likely to be engineers, paramedics, and captains with less risk of injury.

What it means for the fire service

While there are clear advantages to muscular strength and power on the fireground, aerobic fitness is more likely to keep you injury free and on the fire line. Some of the injuries in this study occurred while the firefighter was exercising. In most years, however, the exercise-related injuries were half of the total sprains and strains and a much smaller proportion of the total injuries. Some fire departments have banned exercise while on duty to avoid workman's compensation claims but the risk of injury during exercise is likely outweighed by the benefit of lower total injuries.

Neither the treadmill nor the weight rack is your enemy. Firefighters should follow a balanced program of strength, power, and endurance training to maximize their effectiveness on the fireground and to minimize their risk of injury and heart attack. If you are not following a fitness program, start gradually and adopt a schedule that you can sustain. Starting too aggressively and quitting will not help you in the long run. If you are exercising regularly, look at your program and ask yourself if you are spending too much time on one type of exercise at the expense of another. Adding variety to your program will keep it interesting and better prepare you for the many different tasks encountered on the fireground.