Fit firefighters less prone to injury: study

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By C. E. Huggins

NEW YORK (Reuters Health) - For a physically demanding job like firefighting, fitness is a basic requirement and may protect against injury, U.S. researchers say.

After tracking men and women in the Tucson, Arizona, fire department for five years, the study team found firefighters with the highest aerobic capacity tended to have the fewest work-related sprains, strains and other injuries.

Even though the least fit firefighters were in better shape than the general population, the study shows "those that are 'less fit' in an otherwise fairly fit population of firefighters and medics are still susceptible to an increased risk of injury as compared to their 'more fit' counterparts," according to lead author Dr. Gerald S. Poplin, of the University of Virginia.

Poplin and his co-authors used aerobic capacity - the ability of the body to use oxygen - as a gauge of firefighters overall fitness levels. They got fitness information from records of the fire fighters' annual physicals and tracked injuries in fire department reports covering 2005 through 2009.

The Tucson fire department operates 21 fire stations and serves 520,000 city residents.

Among 799 male and female fire service employees included in the study, 357 had at least one reported injury during the study period. There were a total of 773 injuries - not including strokes, heart attack, heat exhaustion and other conditions that suggest an underlying disease or problem.

Two thirds of all work-related and exercise-related injuries were sprains and strains. Thirty percent of injuries led to lost time on the job.

Poplin's team followed standards from the Wellness Fitness Initiative of the International Association of Fire Fighters (IAFF) and the International Association of Fire Chiefs (IAFC) to divide participants according to fitness level.

They used a measure of aerobic fitness, VO2 max, that represents maximum oxygen levels transported through the body during extreme exertion in the form of milliliters of oxygen per kilogram of body weight per minute.

To put things in perspective, Poplin told Reuters Health, for non fire-service workers, gardening may require 14ml/kg/min of aerobic capacity, whereas professional basketball or cross-country skiing may require more than 50ml/kg/min of aerobic capacity.

In the general population of nonathletes, the average healthy man will have a maximum capacity between about 35 and 40 and for the average healthy woman it will be about 27 to 31.

For the firefighters, an aerobic capacity of less than 43 was considered "less fit" and those with a capacity greater than 48 were considered "more fit." Overall fitness levels among the study participants ranged from about 43.6 to 55.8, the researchers report in the American Journal of Epidemiology.

In general, the firefighters' risk of on-the-job injury increased as their fitness levels decreased. The least physically fit firefighters were more than twice as likely to experience injury as the fittest

The least physically fit individuals also experienced injury sooner, within about two years, than the most physically fit firefighters, who lasted about four years without injury.

In their report, Poplin's team says it's not clear why the fittest firefighters were less likely to get hurt, but they speculate that those "in the top levels of a fitness spectrum may not be as susceptible to microtraumas and may recover better from injury than their less-fit counterparts."

The researchers conclude, "These findings illustrate the importance of fitness in reducing the risk of injury in physically demanding occupations, such as the fire service, and support the need to provide dedicated resources for structured fitness programming and the promotion of injury prevention strategies to people in those fields."

Jim Brinkley, director of Occupational Health and Safety for the International Association of Fire Fighters agreed and also emphasized the importance of teaching proper lifting and bending techniques.

"Fitness without proper movement patterns or proper movement without fitness both leave you unprepared to meet the physical demands of the job," he told Reuters Health.

According to Poplin, the study results indicate that for an individual firefighter, improving aerobic capacity by 3.5 ml/kg/minute

would reduce injury risk by about 14 percent.

However, improving physical fitness among firefighters will require financial resources and specialized trainers, such as the peer fitness trainers used in the Wellness Fitness Initiative, he said.

A key aspect of the initiative, which calls for individualized wellness-fitness programs for active firefighters, is a holistic wellness approach that addresses "medical, fitness, injury/fitness/medical rehabilitation and behavioral health," according to the IAFF Website.

Currently only about 10 states, including Washington, Texas, and New York, have fire departments participating in the initiative, along with one department in Alberta, Canada.

"We have this make-believe image that firefighters and paramedics know how to keep themselves in shape... but they need proper instruction just like everyone else," Poplin said.

Noting that "a lot of fire departments rely on other fire departments," Poplin added that volunteer firefighters would also greatly benefit from such resources.

Brinkley cautioned against a "knee-jerk reaction" of setting a physical fitness standard that all firefighters must adhere to, however.

"Everybody's always looking for that cut off," such as a specific number of push ups or sit ups, he said.

"There are certain levels (of physical fitness) that are benchmarks to improve to meet the demands of the job," he said, but the specific benchmark varies from individual to individual.

"To say that every firefighter must be able to do X" is not right, he said. "It is our position that the best way to measure (fitness) is on an individual basis," he said.

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