

## **Physical Activity Levels and Measures of High-Sensitivity C-reactive Protein in Apparently Healthy Male Firefighters**

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### ABSTRACT

Heart attack or stroke is the number one cause of on-duty death in firefighters. High-sensitivity C-reactive protein (hs-CRP) is a nontraditional risk factor that has been linked to increased risk of future cardiac events. **PURPOSE:** The purpose of this study was to determine if physically active firefighters are less likely to have elevated levels of high-sensitivity C-reactive protein (hs-CRP) than sedentary firefighters. **METHODS:** Self-Reported Physical Activity was determined using the International Physical Activity Questionnaire (IPAQ) in 62 male firefighters from Central Texas. Descriptive measures and blood lipid and metabolic measures were taken to determine cardiovascular risk. After participants were screened for exclusion criteria, a total number of 60 (N=60) firefighters completed the experiment process. The firefighters completed the IPAQ and were placed into two groups based on their score, physically active or sedentary. Participants' anthropometric measurements (body mass index, body composition), blood pressure, hs-CRP and cholesterol levels were measured. Venous blood samples were collected, centrifuged, and sent to an off-site facility for lipid, glucose, and hs-CRP testing. In addition, each firefighter was asked the total number of years involved in the occupation, and approximate number of fires they have worked. A two-way ANOVA with age as a covariate, was used to detect differences in active and inactive firefighters. Pearson product-moment correlations coefficient were used to determine relationships between activity level, cardiac risk and hs-CRP. Significant markers from the ANOVA and correlation coefficients were used to develop a regression equation to predict hs-CRP. **RESULTS:** There was a significant difference in the number of MET\*minutes/wk between volunteer (VT) and career (CT) firefighters (VT: 1927 ± 1369, CT: 2727 ± 1284). This study also determined that hs-CRP risk scores were not correlated to traditional cardiovascular risk factors including total cholesterol (r= 0.014, p= 0.916), LDL-Cholesterol (r= 0.095, p= 0.480), HDL-Cholesterol (r= 0.140, p= 0.295), glucose (r= 0.082, p= 0.540), age (r= 0.021, p= 0.876), and Framingham risk score (FRS)-TC (r= 0.061, p= 0.295). For fire departments that do not have the financial means to pay for hs-CRP testing for all their firefighters, we have devised a regression formula, using significant correlations, to estimate hs-CRP levels. The formula below uses SBP, activity level, weight, body fat percent and waist circumference to estimate hs-CRP (hs-CRP = -2.907 + 0.015(SBP) - 0.487(Act) + 0.032(Wt kg) + 0.048(BF%) - 0.010 (Waist cm)). **CONCLUSION:** Both FRS and hs-CRP risk levels should be used when evaluating risk of CVD in firefighters, and an exercise prescription should be recommended to those firefighters with increased CVD risk.