

## A Comparison of Estimated Heart Rate and Peak Heart Rate in Firefighters and Non Firefighters

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**Abstract:** Firefighters have a mentally demanding job, which requires preparedness to perform important and difficult tasks instantly once called upon, causing sudden peaks in heart rate. **PURPOSE:** To determine whether Firefighters and non Firefighters are mentally synced with their heart rate during strenuous activities. **METHODS:** Six male professional Firefighters (aged  $26.83 \pm 6.08$  years) and five male non professional Firefighters (aged  $25 \pm 4.64$  years) participated in this pilot study. Each Firefighter and non Firefighter performed three and two progressive incline treadmill stress tests, respectively, using a further Modified Balke protocol. One test was performed while wearing regular exercise clothing only. During the second test, a vest weighted to 35.5 lbs was worn. The final test, performed by Firefighters only, was done while wearing fire gear, including boots, bunker pants, coat and helmet. For each test, heart rate was monitored via a Polar heart rate monitor, and rated perceived exertion (RPE) was collected as the subject reached a peak heart rate (PHR). RPE was used to determine the subject's estimated heart rate (EHR). **RESULTS:** Mean EHR and PHR for Firefighters was  $141.67 \pm 34.17$  and  $165.94 \pm 5.50$  bpm. Mean EHR and PHR for non Firefighters was  $164.44 \pm 21.86$  and  $166 \pm 3.43$  bpm. Paired sample t-tests show that there is not a significance difference between EHR and PHR for non Firefighters ( $p=0.828$ ), whereas there is a significant difference between the two for Firefighters ( $p=0.005$ ). **CONCLUSION:** As determined by this pilot study, non Firefighters are mentally synced with their heart rate, whereas Firefighters are not in regards to RPE during physical activity.