

The Effects of Elevation Gain on the Pack Hike Test: Implications for Interagency Hotshot Crews

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ABSTRACT

It is unknown if administering a graded load carriage task, which more closely mirrors the occupational circumstances wildland firefighters are exposed to, improves the validity of the Pack Hike Test and its' ability to differentiate between the fitness profiles amongst Interagency Hotshots (IHC) and type 2 crews. **PURPOSE:** The aim of the current study was to examine the performance differences and HR responses between IHC and type 2 crews when completing a maximal effort graded load carriage task. **METHODS:** This study compared performance outcome measures amongst two classes of hand crews, Type 1 (IHC; $n=12$) and Type 2 (T2C; $n=7$). All participants engaged in one maximal effort hike test, which covered 1.3 miles with a 16.5% grade while carrying a 45 lb. load carriage system. Additionally, participants were instructed to complete the hike at a maximal pace and were given no feedback or motivation during the execution of the test. Immediately following the termination of the test, participants were instructed to perform a supine 1-minute recovery period. Participants wore Polar H10 monitors in order to collect the following variables: Pace (min/mile), HR recovery (bpm), HR average (bpm) and HR max (bpm). **Results:** There were no significant differences between groups for any of the performance or HR response variables ($p>.05$). Compared to T2C, IHC pace (-2.07 min/mile) as well as HR recovery (+3.00 bpm) values trended towards increased performance. Additionally, a tendency emerged for IHC members to sustain higher physiological stress, as indicated by greater relative HR average (+8.18 bpm) and HR max (+8.51 bpm) values. **Conclusion:** IHC, compared to T2C, showed a slight positive trend in their ability to sustain maximal work rates for a longer duration, thus resulting in improved hiking performance. A maximal effort graded load carriage test may provide a better understanding of occupational fitness amongst wildland firefighters.