

Work demands of tanker-based bushfire suppression by Australian volunteer firefighters in southern Australia

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Background

Each year, thousands of Australian volunteer firefighters battle bushfires using fire tankers. The demands of this type of work have not been investigated. Without this information, Australian fire agencies cannot accurately predict the fitness, hydration, or nutrition requirements for safe and productive bushfire suppression.

Methods

- Forty (35 male, 5 female) volunteer firefighters from Country Fire Authority, Victoria ($n = 35$) and NSW Rural Fire Service ($n = 5$) were measured at six bushfire incidents in southern Australia during the 2006-2007 fire season.
- Firefighters were 37 ± 2 yr (18 – 65 yr) old, had served for 10.0 ± 1.4 years (<1 – 35 yr), were 175.1 ± 1.2 cm (166 – 188 cm) tall, and weighed 77.8 ± 1.8 kg (66 – 104 kg).
- Work intensity and duration was determined from heart rate, physical activity, and Global positioning system (GPS) monitoring devices (right).

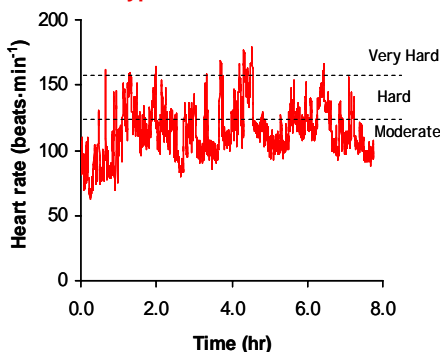
A firefighter wearing work demands monitoring devices



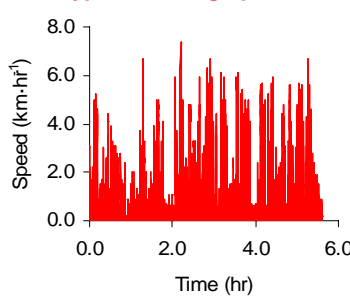
Results

- Firefighters worked for 10 ± 2.1 hr in each shift, with $21.7 \pm 18.4\%$ of that time spent travelling in the tanker.

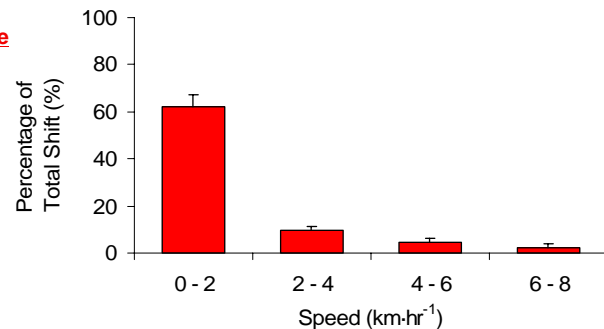
A. Typical Heart Rate Profile



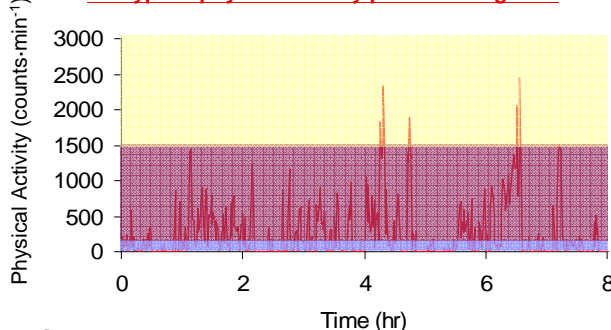
B. Typical Walking Speed Profile



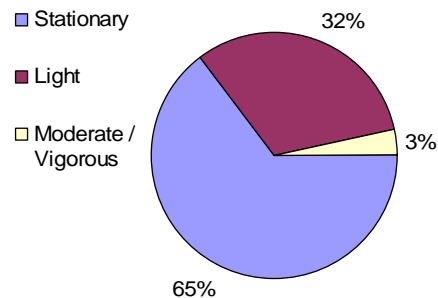
C. Relative time spent walking at different speeds



D. Typical physical activity profile during shift



E. Relative time spent in each activity category



Conclusions

Tanker-based bushfire suppression is an intermittent activity with brief periods of very hard work separated by sustained periods of light to moderate labour. Tanker-based firefighters, therefore, require basic cardiovascular fitness coupled with high task-specific muscular endurance to complete the vigorous and sporadic work intervals they face over a long and hot bushfire suppression shift.