

HEAT AND HYDRATION: FIREFIGHTERS KNOW WHAT TO DO

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BACKGROUND

Firefighters commonly perform their fire-suppression duties in hot environmental temperatures. Furthermore, they do so while wearing heavy personal protective equipment which allows little heat dissipation. This combination of stressors place firefighters at an increased risk of developing heat-related illness while on the fireground. Fire agencies attempt to counter this risk by making sure fluids and electrolytes are readily available, and promoting rest breaks, task rotation, and cooling techniques. However, firefighters also need to be aware of the dangers of working in hot conditions and ensure they take steps to manage their own health whilst in the field



The aim of the research was to assess both the techniques that firefighters used to manage their risk of heat stress, and how effective these techniques were. Thus, the amount of fluids that firefighters consumed both before and during their shift was precisely recorded, and firefighters urine was analysed for urine specific gravity (USG; below, right) to assess hydration status.



METHODS

In the present study, firefighters completed a 6-hr simulated 'shift' of fire-suppression work, in either a hot (32°C) or temperate (19°C) ambient environment. The fire suppression tasks performed included:

- Lateral hose repositioning
- Blackout hose work
- Charged hose advance
- Hose rolling
- Static hose hold
- Rakehoe work



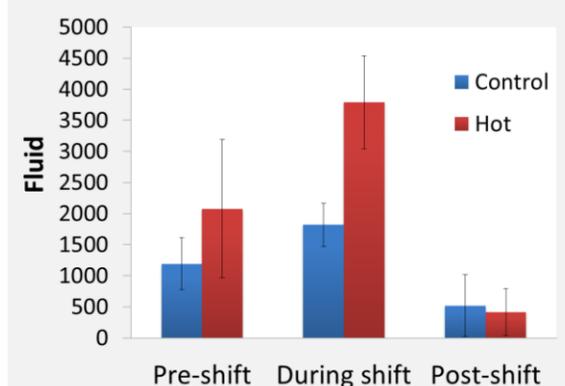
RESULTS

A major finding of the study was how the firefighters regulated their fluid intake. Participants were alerted to which condition they would be completing the night prior to the study. Interestingly, from this moment, **firefighters allocated to the hot condition almost doubled their fluid intake** (2077 ± 1116 mL) compared to the control group (1189 ± 419 mL), in preparation for their 'shift'.

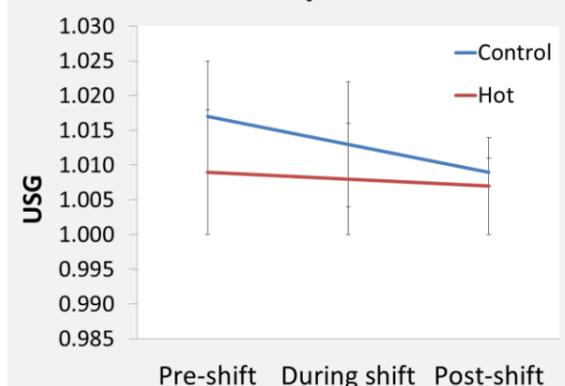
This elevated fluid intake was maintained across the 6-hr period; firefighters in the hot trial consumed 3794 ± 1537 mL of fluids compared to 1818 ± 741 mL in the control condition.

The impact of this increased fluid consumption was reflected when the firefighters urine was analyzed to assess hydration status. **Firefighters in the hot condition were actually more hydrated than their control counterparts**, both prior and during their 'shift'.

Fluid consumed (mL) pre, during, and Post-shift



Urine specific gravity pre, during, and post-shift



CONCLUSIONS

The fluid volumes consumed by firefighters in the study are similar to that observed in previous field observations. Under hot conditions (32°C), firefighters are able to self-manage their fluid intake to remain appropriately hydrated during fire-suppression work in the heat. The increased pre-shift fluid consumption perhaps speaks to the adaptive ability of firefighters to take onboard agency-supplied information, and implement it when required.