

## VASCULAR CHANGES FOLLOWING EXERCISE-INDUCED HYPERTHERMIA

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The combination of hyperthermia and heavy exercise/exertion encountered during firefighting may impair vascular function, increasing risk of sudden cardiac events. **Purpose:** To isolate the effect of exercise-induced hyperthermia on arterial stiffness and coronary perfusion. **Methods:** Vascular measures were collected in 12 healthy men (age  $22 \pm 3$ yr; BMI  $24.6 \pm 2.8$ kg·m<sup>-2</sup>; VO<sub>2</sub>max  $60.3 \pm 4.44$ mL·kg<sup>-1</sup>·min<sup>-1</sup>) pre and post 100-minutes of intermittent exercise (3 bouts) in 2 randomized conditions: hyperthermic (HYT; wearing personal protective equipment), and normothermic (NOT; wearing a cooling shirt and weight equivalent to PPE). **Results:** Hyperthermic mean core temperature was significantly higher than NOT during the third exercise bout (peak  $37.82 \pm 0.22$  vs  $37.21 \pm 0.40$  °C) and into recovery ( $p < 0.05$ ). Measures related to coronary perfusion (subendocardial viability ratio, backwards wave pressure) were significantly lower for HYT-Post compared to other times/conditions (Table 1;  $p < 0.05$ ). No significant changes were found in arterial stiffness (forward wave pressure or pulse wave velocity). **Conclusion:** Exercise-induced hyperthermia reduces indices of coronary perfusion without affecting arterial stiffness.

**Table 1:** Vascular and hemodynamic variables pre and post exercise (mean  $\pm$  SE; N=12)

	NOT-Pre	NOT-Post	HYT-Pre	HYT-Post
Subendocardial viability ratio	208 $\pm$ 9	232 $\pm$ 13	200 $\pm$ 9	150 $\pm$ 11*
Forward pressure wave (mmHg)	33 $\pm$ 2	33 $\pm$ 2	33 $\pm$ 2	33 $\pm$ 2
Backwards pressure wave (mmHg)	16 $\pm$ 1	16 $\pm$ 11	16 $\pm$ 11	11 $\pm$ 1*
Pulse wave velocity (m·s <sup>-1</sup> )	4.9 $\pm$ 0.1	4.9 $\pm$ 0.2	5.0 $\pm$ 0.1	4.9 $\pm$ 0.1

\* HYT-Post < NOT-Pre, NOT-Post, HYT-Pre ( $p < 0.05$ )

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