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A New Occupational Heat Tolerance Test: A Feasibility Study

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ABSTRACT

Heat tolerance tests identify those susceptible to heat illnesses and monitor heat adaptations. Currently, tolerance tests do not replicate the uncompensable heat strain environments experienced in some occupations. In addition, tests can take up to 2 hours to complete, and cannot offer intra and inter individual comparisons, due to the use of a fixed exercise intensity. This study aimed to assess the validity and reliability of a new heat occupational tolerance test (HOTT: 40min at 6W.kg^{-1} metabolic heat production, 50°C 10% RH, in protective clothing) to the standard heat tolerance test (HTT: 2hr walk at 5km.hr^{-1} 1% gradient, 40°C 40% RH, in shorts and t-shirt). Eighteen participants (age: 21±3 yrs, body mass: 81.3±5.9 kg) completed trials to assess the validity and/or reliability of the HOTT. Peak rectal temperature (T_{re}) displayed strong agreement and low measurement error (0.19°C) between HTT (38.7±0.4°C) and HOTT (38.6±0.4°C). Strong agreement was also displayed for physiological and perceptual measures between the two HOTT trials, including peak T_{re} (38.5±0.4°C

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