

## ABSTRACT

The practice of precooling, or reducing core temperature ( $T_c$ ), improves exercise performance by starting the body at a cooler temperature, thereby enabling an athlete to increase their heat storage and perform more work prior to reaching a limiting  $T_c$ . **Purpose:** To observe the effects of various precooling and warm-up combinations on 5km time trial performance as well as to develop an ideal method of standardization to reduce performance variability within the time trial. **Methods:** Seven highly-trained male endurance runners completed a familiarization trial, as well as four trials consisting of different combinations of a 10-minute warm-up, 30-minute precool by cold water immersion ( $24 \pm 1^\circ\text{C}$ ) or 30 minutes of sitting. Each pretreatment condition was then followed by a 5km time trial treadmill run. Core temperature ( $T_c$ ), heart rate (HR), distance run (DR) and rating of perceived exertion (RPE) were measured during all experimental trials. **Results:** Five km time trial performance was not significantly different between conditions ( $p=0.996$ ). Although not significant, 71.4% of participants completed the warmup/precool condition as their fastest time trial. During the pretreatment period,  $T_c$  was lower in the control conditions compared to their respective precool conditions. Core temperature was lower in the precooling conditions at the beginning of the 5km time trial; however this difference was dissipated after the first nine minutes. Heart rate (HR) and RPE were not different between conditions, suggesting that participants put forth similar, maximal effort during each trial. **Conclusion:** Cold water immersion for 30 minutes was effective in reducing  $T_c$ , and when an active warm-up is completed preceding a precooling protocol, 5km running time trial performance may be improved.