

ORAL PRESENTATION

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Training in extreme hot and cold

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Since the 5th century BC consideration has been given to diet and training for improved physical performance. In contrast the impact of environmental temperature and humidity on performance has largely been ignored until recent times, despite the fact that the environmental threat can result in severe impairment of performance and even death.

As physical performance is impaired in both hot and cold environments, the challenge in these environments is to try, through various interventions, to maintain as closely as possible, elite performance. The thermal threats include: thermal discomfort detrimentally influencing concentration, dehydration, heat syncope, heat exhaustion, heat stroke, cold-induced neuromuscular dysfunction, cold injury, drowning and hypothermia.

Strategies and interventions to reduce the impact of environmental extremes on performance include: selection strategies, clothing design, acclimation and acclimatisation protocols, fluid replacement strategies, artificial sweating, active cooling and chemical or psychological perceptual adjustment.

Which if these interventions are appropriate depends on the mode of exercise to be undertaken, the specific nature of the thermal threat and the characteristics of the athlete in question. It follows that for optimal performance maintenance at the elite level, these considerations should be conducted on an individual basis, and include a detailed analysis of the conditions to be faced and thermoregulatory characteristics of the athlete in question.

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References

1. Tipton MJ, Golden F: *Immersion in cold water: effects on performance and safety*. Chapter in: *Oxford Textbook of Sports Medicine*. 2nd Edition edition. Oxford University Press, Oxford; 1998.

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2. Tipton MJ: *Environmental Factors*. Chapter in: *ABC of Sports Medicine*. Oxford University Press; 2005.
3. Tipton Mj, Pandolf K, Sawka M, Werner J, Talor NAS: *Physiological adaptation to hot and cold environments*. Chapter in: *Human performance in the cold: the physiology of acute cold exposure*. In *Physiological bases of human performance during work and exercise* Nigel A. S. Taylor, Herbert Groeller and Peter L. McLennan 2007.

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