HUMAN HYPERTHERMIA-INDUCED HYPERPNEA: MECHANISMS AND CONSEQUENCES.

White, MD

Laboratory for Exercise and Environmental Physiology,
School of Kinesiology, Simon Fraser University
8888 University Drive,
Burnaby BC, Canada, V5A 1S6

A pattern of breathing adopted during hyperthermia in humans is thermal hyperpnea or hyperthermic induced hyperventilation. This form of hyperventilation is evident after an increase in core temperature, although other traditional modulators of pulmonary ventilation are known to be involved in the mechanism(s) of control underlying this response. The study of these mechanisms as well as the consequences of this hyperthermic-induced ventilatory response is a topic of concentrated and current research in thermophysiology. The purpose of this presentation will be to review recent advances of the putative mechanisms that are believed to underlie this response, as well as to present evidence on the effects of this response on human cranial thermoregulation. A physiological rationale for thermal hyperpnea will also be presented in which it is suggested that this response serves a heat-loss role and contributes to selective brain cooling in hyperthermic humans. A brief summary will be given on the applications of this research for the care of febrile and hyperthermic patients.