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Catherine O'Brien, Larry G. Berglund



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Predicting Recovery from Exertional Heat Strain in Military Working Dogs

Catherine O'Brien^{1*} and Larry G. Berglund²

¹Thermal and Mountain Medicine Division

²Biophysics and Biomedical Modeling Division U.S. Army Research Institute of Environmental Medicine Natick, MA 01760-5007

*Corresponding author: Catherine O'Brien Thermal and Mountain Medicine Division U.S. Army Research Institute of Environmental Medicine 10 General Greene Ave. Natick, MA 01760-5007
Catherine.obrien2.civ@mail.mil

Abstract

A two-compartment (core, skin) rational Canine Thermal Model (CTM) of thermal-physiological responses was developed to predict the core temperature (T_c) of a military working dog (MWD) during recovery from exertional heat stress. Heat storage is represented as the balance among heat loss mechanisms, heat gain from the environment, and heat production from metabolism. Inputs to the CTM include environmental conditions (ambient temperature, relative humidity, solar radiation and wind speed), physical characteristics of the dog (weight, length), and metabolic rate. The CTM was validated against T_c of 16 MWDs measured in a previous study, where training was conducted in October (24°C, 52% RH), March (14°C, 74% RH), and August (28°C, 64% RH). Measured and CTM-simulated T_c were compared at 5, 10, 15, 30 and 60 min

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