Abstract:

Objective: Hypothermia secondary to environmental exposure is a serious condition. Active external warming measures to treat it may prove challenging in the prehospital setting. We conducted an experimental study to measure the ability of commercially available heating elements to warm intravenous (IV) fluids during infusion.

Methods: 250-milliliter bags of dextrose 10% solution were suspended inside a refrigerator. IV tubing was coiled, and the tubing output was placed inside a thermally insulated cup. The tubing was heated directly with a hand warmer, a meals ready-to-eat heater, or a heating blanket. Fluids were run through the IV line. The temperature of the fluid at the tubing output was measured. The initial and final infusion temperatures for the methods were compared.

Results: The use of hand warmers, meals ready-to-eat heaters, and heating blankets to warm IV tubing did increase the temperature of the fluids but was ineffective at achieving the desired mean infusion temperature of 35°C to 42°C.

Conclusion: Although the mean temperature increase did not meet the established experimental threshold, further research is needed to determine whether the fluid warming effect of these commercial heating elements used in the prehospital environment is significant enough to limit heat loss while repleting the dextrose of a hypothermic, hypoglycemic patient.

Reference: