

# Cryotherapy of the Equine Digit for the Treatment of Laminitis: Assessment of a Novel Method by Measuring Digital Venous Temperature

Heidi L. Reesink, VMD; Thomas J. Divers, DVM, Diplomate ACVIM, ACVECC;  
 Lauren C. Bookbinder;  
 Andrew W. van Eps, BVSc, PhD, MACVSc, Diplomate ACVIM;  
 Leo V. Soderholm, BS; Michael J. Wildenstein, CJF, FWCF (Hons); and  
 Jonathan Cheetham, VetMB, PhD, Diplomate ACVS

A 60-cm wader boot or 5-l IV fluid bag filled with crushed ice water is an effective means of cooling both laminar and digital venous temperatures in normal horses. Authors' address: Cornell University, Hospital for Animals, Department of Clinical Sciences, VMC, Ithaca, New York 14853; e-mail: hlr42@cornell.edu.

## 1. Introduction

Cryotherapy of the equine digit is the only treatment that has been shown to prevent the development of acute laminitis in horses. The current gold standard technique restricts the horse's movement and, as a result, is not widely used. The goal of this study was to compare digital venous temperature to laminar temperature after the application of three separate methods of cryotherapy.

## 2. Materials and Methods

A randomized, crossover study design was used with a minimum 1-h washout period between treatments. Four treatments were applied: (1) wader boot with ice water; (2) 5-l IV fluid bag with ice water to the level of the fetlock; (3) velcro half-limb ice boot; and (4) control (no cryotherapy). Digital venous and laminar temperatures were recorded at 1-min intervals using thermocouples. Pretreatment data were

collected for 15 min (baseline), followed by application of cryotherapy for 120 min. All horses tolerated the IV and laminar thermocouples well. All procedures were approved by the local Institutional Animal Care and Use Committee (Protocol 2009-0123).

## 3. Results

The gel boots produced minimal hoof cooling ( $-3.2 \pm 1.61^{\circ}\text{C}$ ). The ice bag produced marked cooling ( $-23.2 \pm 1.52^{\circ}\text{C}$ ), and the wader boot produced the most profound cooling below baseline laminar temperature ( $-24.7 \pm 1.63^{\circ}\text{C}$ ), reaching mean laminar temperatures of  $9.8^{\circ}\text{C}$ . Digital venous temperature closely correlated with laminar temperature.

## 4. Discussion

Cryotherapy with an ice wader boot or ice bag seems to be an effective method of providing laminar and venous cooling, reaching temperatures similar to those previously shown to prevent laminitis.

---

Research Abstract

---

## NOTES