Anesthetic Diffusion Following Two Approaches to Block the Deep Branch of the Lateral Plantar Nerve

Kevin M. Claunch, DVM; Randy B. Eggleston, DVM, Diplomate ACVS; and Gary M. Baxter, VMD, MS, Diplomate ACVS

1. Introduction
The objectives of this study were to compare the diffusion patterns and risk of inadvertent injection into synovial structures for two different techniques that have been described to block the deep branch of the lateral plantar nerve (DBLPN) with the use of two different volumes of anesthetic.

2. Materials and Methods
In 16 horses, either 2 mL or 8 mL of mepivacaine hydrochloride-iodixol (50:50 mixture) was injected with the use of one of two different techniques to block the DBLPN. Radiographs were obtained before and at multiple time points after injection. The extent of diffusion of the contrast solution and whether or not contrast appeared to be present in any synovial structures were determined.

3. Results
A high degree of variability in diffusion was noted among injections. High-volume injections diffused significantly further than did low-volume injections. Contrast agent was documented within the tarsal sheath in 16% of injections (five of 32) and within the tarsometatarsal (TMT) joint in 6% of injections (two of 32). A significant difference in diffusion pattern was observed between the two techniques.

4. Discussion
The 2-mL injection appeared to be in the correct location of the DBLPN. A low-volume injection may be superior to a high-volume injection to decrease the number of false-positive responses to local anesthesia. A perpendicular needle approach may be the preferred technique to avoid proximal diffusion of anesthetic.