Longitudinal Monitoring of Fetlock Injuries in Thoroughbred Racehorses Using Standing \(^{18}\)F-NaF Positron Emission Tomography

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Positron emission tomography (PET) findings in the racehorse fetlock were repeatable. Significant reduction in radiopharmaceutical uptake associated with the palmar condyles and medial proximal sesamoid bone was appreciated over a 3-month lay-up period. Authors’ addresses: School of Veterinary Medicine, University of California, Davis, One Shields Avenue, Davis, CA 95616 (Spriet, Pye); Southern California Equine Foundation, 285 West Huntington Drive, Arcadia, CA 91007 (O’Brion); Equine Medical Center, PO Box 1491, Sierra Madre, CA 91025 (Carpenter); von Bluecher, Blea & Hunkin, Inc., 282 West Sierra Madre Blvd, Sierra Madre, CA 91024 (Blea); and 400 Harvard Drive, Arcadia, CA 91007-2638 (Dowd); e-mail: mspriet@ucdavis.edu. *Corresponding and presenting author. © 2021 AAEP.

1. Introduction
A standing equine positron emission tomography (PET) scanner has recently been developed that permits serial PET imaging without the risks associated with general anesthesia. The goals of this study were to assess the repeatability of standing PET findings and to evaluate the ability of PET to monitor progression of lesions in the fetlocks of Thoroughbred racehorses.

2. Materials and Methods
Twenty-five horses (54 fetlocks) were imaged with standing \(^{18}\)F-NaF PET on three occasions six weeks apart. Images were reviewed by a radiologist and an equine surgeon, and areas of increased radiopharmaceutical uptake (IRU) were graded using a previously validated system and quantified using maximal standardized uptake values (SUVmax). Statistical comparisons were made between scans to detect changes in lesion grade and SUVmax over time.

3. Results
Standing PET findings were found to be repeatable, with 131/149 (88%) areas of IRU identified on the initial scans seen again at the 6-week follow-up...
Overall, 65% of fetlocks demonstrated improvement in lesion grade during the 3-month lay-up period. Significant differences for SUVmax ratios between the different scans were reached for the lateral and medial palmar condyles and the dorsal aspect of the medial proximal sesamoid bone (P = 0.0006, P < 0.0001, and P = 0.0006 respectively).

4. Discussion
Standing PET scans may be used to monitor areas of the fetlock involved in catastrophic breakdown injuries in Thoroughbred racehorses.

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Declaration of Ethics
The Authors have adhered to the Principles of Veterinary Medical Ethics of the AVMA.

Conflict of Interest
The Authors have no conflicts of interest.