

## Imaging Modalities Help Translate Research to Clinical Care

With some of the most advanced and exclusive equine imaging capabilities available in veterinary medicine, UC Davis is able to stay at the cutting edge of detecting, diagnosing and treating horse racing injuries. By utilizing information learned through the school's J.D. Wheat Veterinary Orthopedic Research Laboratory, radiologists and clinicians at the veterinary hospital advance the care and rehabilitation of equine athletes.

Magnetic resonance imaging (MRI) uses a powerful magnetic field, radio waves and a computer to produce detailed pictures of organs, soft tissues, and other internal body structures. Detailed MRIs allow veterinary radiologists to better evaluate injuries that may not be assessed adequately with other imaging methods such as x-ray, ultrasound or computed tomography. MRIs can provide early detection of tendon and ligament lesions in horses, potentially reducing the severity of the injury.

A brand new imaging modality now available is positron emission tomography (PET scan). Used mostly in human medicine, UC Davis is introducing PET scanning to the equine world. Following testing of a prototype PET scanner for equine research last year, the hospital recently acquired its own PET scanner through donations from the Carol Green



Dr. Mathieu Spriet positions a horse's leg in UC Davis' new portable PET scanner.

Sundance Ranch Fund. PET imaging of horses has not previously been possible due to the difficulty of positioning equine patients inside the standard PET instruments. With the new portable design, this molecular imaging modality can now be applied to improve management of equine lameness.

### Imaging Assistance with Stem Cells

Radiologists at the school are also pioneering the use of imaging technology to monitor stem cell positioning in acute tendon lesions in horses. Although stem cells hold tremendous promise for repairing injured tissue, getting cells to the site of injury is not always clear. Thus, veterinary researchers have relied on tracking technologies to monitor the persistence and location of stem cells after administration. Better visualization of the location is a necessity to advance regenerative medicine therapies. Nuclear medicine (scintigraphy and PET) and MRI can be used for stem cell tracking. Scintigraphy documents regional distribution and persistence of stem cells while MRI illustrates the exact location of stem cells after administration. Applications of the newly acquired PET scanner toward this goal hold exciting promise for the future, as faculty work with stem cells to continue to improve the treatment of cartilage and tendon injuries.