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NEWS & EVENTS

Challenging Cornea Repair Means Owl Can Return to the Wild

When a Boone County couple brought a great horned owl to the University of Missouri Veterinary Medical Teaching Hospital on Oct. 4, Raptor Rehabilitation Project volunteers gave her a name in keeping with a recent theme: Pepe's Penelope. Pepe alludes to Pepe le Pew, and Pepe's Penelope, the unfortunate owl, bore the distinct odor that typically follows a close encounter with a skunk. It is not uncommon for raptors to arrive at the project's facilities with the lingering scent from trying to hunt the wrong prey, said MU veterinary medicine student Stephen Treese. Treese, one of the project's volunteers, took responsibility for Penelope's care, and clean-up, while she was treated at MU. However, it was not the need of a bath that prompted the couple to bring the bird to the veterinary hospital. Penelope had a far more serious concern.

The couple first noticed the owl sitting on the ground near their driveway as they left their house. When they returned later in the day and realized the bird was still in the same spot, they became concerned that she was ill or injured. At the MU veterinary hospital volunteers with the Raptor Project triaged her and tried to determine why she couldn't seem to fly.

The Raptor Rehabilitation Project is a service and education partnership of the MU College of Veterinary Medicine and the surrounding community. Veterinary students, other MU students and community members volunteer their time to rehabilitate injured raptors and care for resident birds. Volunteers also raise awareness about birds and their needs by giving presentations at schools and other forums throughout central Missouri. In addition to a raptor wing within the veterinary hospital, the project maintains mews for the birds, as well as a flight cage where recovering birds can rebuild their strength and



Dr. Kevin Donnelly holds Pepe's Penelope just prior to the great horned owl's release back into the wild.



MU veterinary ophthalmology resident Dr. Kevin Donnelly and veterinary ophthalmologist Dr. Jacqueline Pearce implanted a conjunctival graft in the owl's eye to repair a ruptured cornea.

ability to hunt.

Treese said Penelope was slightly dehydrated, but for the most part exhibited good overall health. However, she had sustained a serious injury to her left eye. Treese said that as they hunt, raptors display a linear focus that may have resulted in Penelope's eye getting nicked by a branch. Although the injury itself would not preclude flight, Treese speculated that the owl was in shock from the injury when the property owners discovered her.

Project volunteers contacted the VMTH ophthalmology service to examine Penelope. Kevin Donnelly, DVM, an alumnus of the MU College of Veterinary Medicine, is pursuing a residency in ophthalmology. He and Jacqueline Pearce, DVM, an assistant teaching professor in veterinary ophthalmology at MU, examined the owl and discovered her cornea was ruptured.

"Vision is hard to assess, but her pupil was not responsive to light," Donnelly said. "We had evidence of some trauma. There was some bleeding inside her eye."

Donnelly and Pearce determined that the best way to treat the injured eye would be to implant a conjunctival graft.

"The cornea has no blood vessels," Donnelly explained. "While a human could get a corneal transplant, this type of procedure has not been routinely successful in birds and donor tissue was not readily available."

However, the conjunctiva, the healthy pink tissue that surrounds the eyes, does have a blood supply. A few days after Penelope came to the VMTH, with Pearce assisting during the surgery, Donnelly took a sliver of her conjunctiva, still connected at the base to maintain the blood supply, and moved it to create a physical support for the weakened cornea.

Donnelly said that after completing his DVM, he was drawn to pursue microsurgery as a professional specialty because it allows him to work with his hands and provides the opportunity to help a variety of species, but this was the first time he had performed this particular procedure on a bird.

"It's more difficult on birds than other species because their eyes are smaller and don't move in their head. Their cornea is also thinner than a dog's cornea," he said.

Although the procedure succeeded initially, approximately two weeks after the surgery the graft came loose. The graft itself was still viable, so Donnelly and Pearce returned to surgery to perform a second procedure on Penelope. Donnelly said this time they added a biosynthetic scaffold to cover the defect and make the graft even stronger.

"Within four to six weeks after the second surgery, her pupil was responsive to light," Donnelly said.

At that point in her recovery, Penelope was moved to the Raptor Rehabilitation Project's flight cage to work on rebuilding her strength and demonstrate her ability to hunt in preparation for her return to the wild. Treese said within two weeks the owl was ready, but project volunteers wanted to wait for the weather to cooperate. "It's a little disorienting for them when they're released back into the wild, so we like to release on warmer days to minimize the stress," Treese explained.

That day came on the morning of Jan. 11. Donnelly, Treese and other project volunteers drove Pepe's Penelope back to the partially wooded property in northern Boone County where she had originally been found. They were joined by the couple who had brought her to the Raptor Rehabilitation Project in October. Treese removed her from her box and handed her to Donnelly, who held her legs with one gloved hand and supported her with the other. As he released his grip, Penelope took flight. "This has been one of the most rewarding things I have been a part of," Donnelly said.

A video of Pepe Penelope's release is [available on Youtube](#).

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