

Geriatric care at KC Zoo includes laser therapy for elephant arthritis, gorilla echocardiograms



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Suffice it to say that when you weigh more than 8,000 pounds and, at 47, are one of the oldest female African elephants in North America, time and tonnage place a heavy toll on your geriatric bones.

“Whenever you’re ready,” Scott McCall, the elephant manager at the Kansas City Zoo, said recently as he led Lady, one of the zoo’s six African elephants, to the safety bars inside the exhibit’s elephant barn.

Since late July, Lady has been receiving a regular treatment to help soothe the age-related arthritis plaguing the pachyderm's "wrists," the carpus bones of her front limbs, and "ankles," the tarsus bones of the rear.

"OK, ready," said Kirk Suedmeyer, the zoo's chief veterinarian. With yellow goggles protecting his eyes, he bathed Lady's joints in a beam of bright red light.



Laser Therapy For Lady, KC Zoo's geriatric elephant

KC Zoo's 47-year-old African elephant, Lady, gets laser therapy for arthritis

Over the next 30 minutes, Lady's four limbs would receive a warm dose of inflammation-reducing laser therapy, which is just one of a number of recent technologies that the Kansas City Zoo and other zoos nationwide have begun using to maintain the health of their ever-aging collections.

In Kansas City, Suedmeyer estimated, some 25 percent of the zoo's 1,100 animals are what would be considered geriatric. With captive breeding and conservation of animals in the wild a priority, zoos for years have steered away from rejuvenating their collections with wild-born species, unless deemed vitally necessary.

"We don't do that anymore," Suedmeyer said, "so we have to take care of what we've got."

Because that better care has allowed zoo animals to grow grayer and longer in the tooth, geriatric health has become as much a trend in zoo animals as it has in humans.

“They are living a lot longer in our care than they used to, so we have had to figure out strategies and methods to deal with an aging population,” said Rob Vernon, spokesman for the Association of Zoos and Aquariums, the body that certifies and represents 214 facilities in the U.S.

At Ohio’s Columbus Zoo and Aquarium, keepers in January recorded the use of acupuncture to ease the pain of hip dysplasia in a 16-year-old male koala named Moondani. Anti-inflammatory drugs are routinely given to dogs that suffer the inflammatory condition. But koalas can’t effectively metabolize those drugs.

“We did a needle-less acupuncture with him. It almost looks like a giant ink pen that a specialist would use to touch his body,” said Shannon Morarity, the zoo’s assistant curator of Australia and the Islands. The pen emits short electrical pulses.

“We saw positive results” after about 10 sessions, she said. The zoo more recently has decided to switch to laser therapy.

Also in the Columbus zoo’s Australia exhibit is an arthritic tree kangaroo with spinal problems that gets the powdered drug Cosequin, along with routine injections of Adequan, drugs typically used to treat joint problems in animals such as horses and dogs.

In the same way aged and weary humans welcome a nice bench to sit on, so too does Colo, the Columbus zoo’s famed Western gorilla, who in December 1956 made worldwide headlines as the first gorilla born in captivity.

At age 58, she is old now. So zookeepers have built flat benches into the branches of her trees to make it easier for her to sit and keep her balance. Unable to scramble up a tree like younger gorillas, she has extra rubber hoses to aid her climbs.

Because arthritis is such a persistent problem, Suedmeyer in Kansas City is preparing for the future.

Since April, the veterinarian has removed small samples of fat from five of the zoo’s animals — a crested mangabey, a scimitar oryx, an otter, a red-handed tamarin and a bobcat named B.B. — to extract stem cells.

Stem cells essentially are the equivalent of young and impressionable cells whose genetic gears have yet to determine their fate. Because they are so young, they theoretically can turn into any kind of cell, from cartilage to neurons.

Using stem cells to treat existing arthritis in horses and dogs has already shown some success.

But the idea at the zoo, Suedmeyer said, is to use the stems cells prophylactically, meaning as a preventive of harmful disease. He believes the Kansas City Zoo is the first, or among the first, zoos in the nation to begin such a program, which he plans to extend to other animals in the collection.

As soon as early signs of arthritis begin to appear in a zoo animal, the animal's own stem cells, kept frozen for preservation, would be thawed and injected into the joints in the hopes it would turn into cartilage tissue and lessen the disease before it worsens, and perhaps reduce any need for drugs.

"As soon as B.B. the bobcat begins to show signs of arthritis, we could inject that," Suedmeyer said.

Arthritis is far from the only disease of aging affecting exotic animals. One chimpanzee had cataracts, Suedmeyer said.

"We had glaucoma in a kangaroo where the staff was able to condition her to accept drops in her eyes," he said.

The zoo does not currently have any animals with dental implants because of worn teeth, Suedmeyer said, but "we've done it in the past."

The No. 1 killer of humans, heart disease, also happens to be the top killer of gorillas in captivity. Chimpanzees, orangutans and bonobos also suffer the disease.

At the Lincoln Park Zoo in Chicago, all 11 of the zoo's chimpanzees — both young and as old as 35 — have been given internal heart monitors, tiny USB-like devices implanted in the muscle just above their hearts.

Sudden heart failure is the biggest killer of aged captive chimpanzees. By constantly monitoring the hearts of all of its chimpanzees, the Chicago zoo is gathering data on which of its chimps seem most vulnerable.

What they're finding is that some of the more dominant chimps, the leaders, may be more vulnerable to sudden death because of the release of stress hormones that play a role in myocardial fibrosis, or scarring of the heart tissue. The scarring leads to irregular electrical conduction across the heart.

"It is showing us that what we think are healthy hearts plumbing-wise may not be healthy hearts electricity-wise," said Kathryn Gamble, the zoo's director of veterinary medicine, and who heads the program.

Zoo Atlanta, meanwhile, has been leading an international effort known as the Great Ape Heart Project, in which the hearts of gorillas, orangutans, chimpanzees and bonobos are monitored regularly. It includes taking echocardiograms of the gorillas' hearts to help monitor and figure out the disease.

Kansas City has similarly trained its gorillas, including the aged silverback Radi, to present their chests for regular echocardiograms using a portable wand. Numerous zoos, including those in Detroit and Atlanta, have recorded videos showing the process.

Zoo Atlanta has 20 gorillas, the largest collection of any U.S. zoo.

“We have three gorillas that we consider senior, or geriatric,” said the zoo’s lead keeper of primates, Jodi Carrigan.

Among the most aged are Shamba, a 56-year-old female. Ozzie, at 54, is thought to be the oldest male gorilla in the world. Choomba, another female, is 53. Together, they live in a special enclosure with beds that are closer to the ground, and where they receive food that is easier to eat.

“We call it their retirement home,” Carrigan said.

Like other seniors, they’ve got their pills, including tramadol and Celebrex for pain and arthritis. Ozzie takes the heart medicines enalapril and carvedilol.

“Ozzie, he has a good heart,” Carrigan said. “It’s just an old heart.”

Suedmeyer said the most difficult part of caring for aged animals is making the difficult decision of exactly when to end that care. Euthanizing animals as they have grown too old and ill occurs at all zoos.

“That’s the worst part of my job,” Suedmeyer.

But the ethics of end-of-life decisions regarding pain and quality of life are no different for exotic zoo animals than they are for people.

Suedmeyer recalled the case of a tiger from some 20 years ago. It was in pain with five ruptured discs in its back.

“It was an aged tiger,” Suedmeyer said. “We had the surgeon right here. I asked, ‘Can you do the surgery?’ He said, ‘Yes.’”

And the tiger would have survived. But whatever brace they would have used to help the tiger heal would not have lasted.

“But we euthanized the tiger,” Suedmeyer recalled. “Because it wouldn’t have been right. You can’t take care of the tiger afterward. He doesn’t just pop off the table and start walking around. You have to ask, ‘Are you causing more problems by doing it?’”

After her laser therapy, Lady wandered from her barn.

Although laser therapy is effective in horses and other animals, it is still unclear, Suedmeyer said, whether it will be equally effective for an African elephant, with bones so large and so deep beneath its skin and muscle. But with no known side effects to the treatment, Suedmeyer figured it was worth a try.

“Let me know if you see any improvements in her walk,” he told the keepers as he left the barn.

Outside, with the doctor’s appointment over, it was time for a snack. The old elephant munched on hay.