

## How high-tech treatments add hope, and cost, to keeping a sick pet alive



Veterinary assistants Cory Wakamatsu, left, and Talon McKee prep Coach, a year-old Bernese mountain dog, for surgery with Brynn Schmidt, lead anesthesia technician, right, at the VCA West Los Angeles Animal Hospital. (Christina House, For the Los Angeles Times)

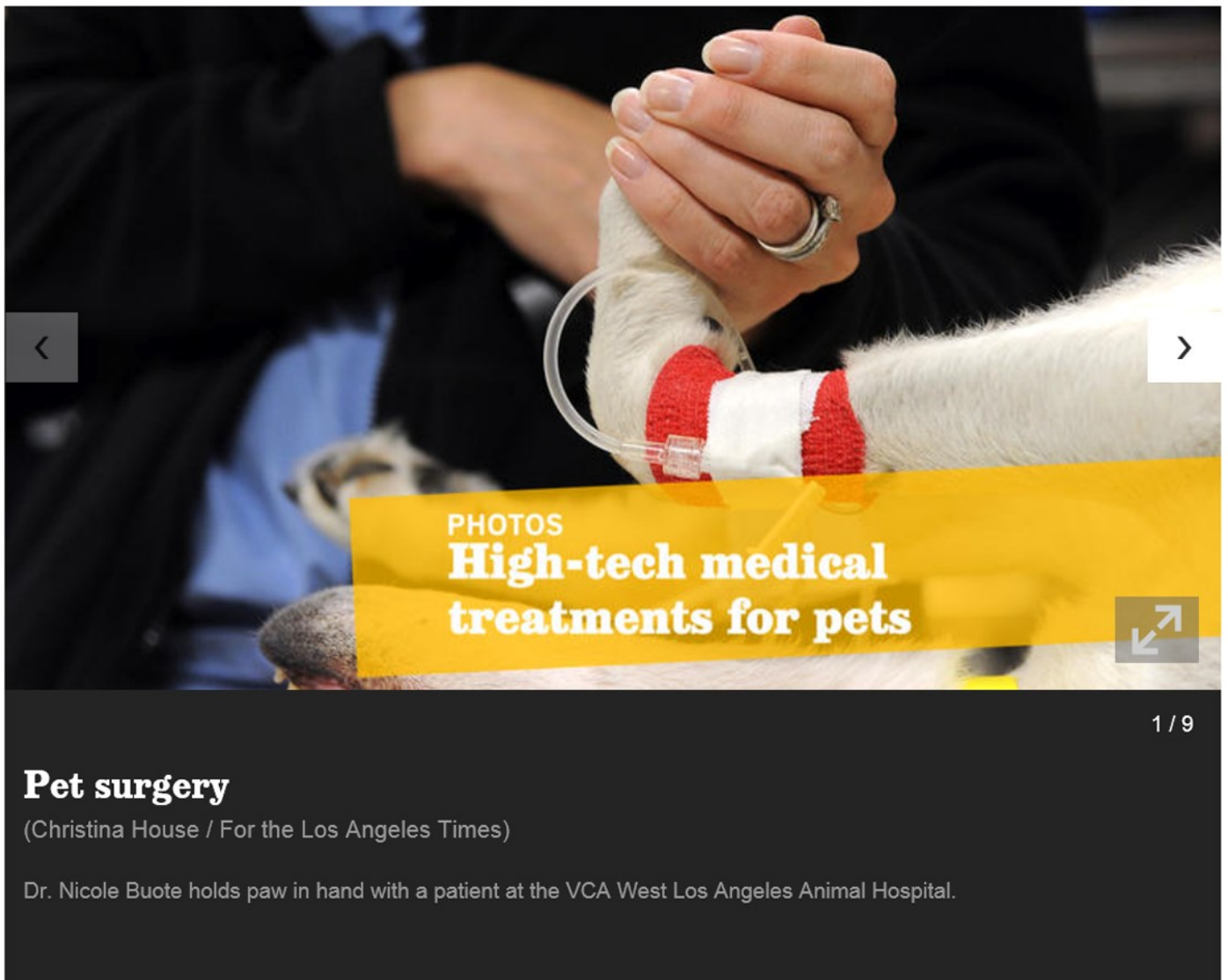
By **LILY DAYTON**

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If your golden retriever was diagnosed with cancer 10 years ago, you were likely given two options: chemotherapy or compassionate euthanasia. Today, you may have access to a variety of advanced treatments, such as stents that deliver high doses of chemotherapy straight to the cancerous growth, the injection of tiny beads that block the tumor's blood supply or precise radiation guided by high-definition imagery. You may even be able to take advantage of what many veterinary oncologists consider the holy grail: new immunotherapies that harness your pet's immune system to launch an attack on cancerous cells.

"That's what is so cool about this," says Dr. John Chretin, head of oncology at VCA West Los Angeles Animal Hospital. Not only are there more treatment options available, but "nowadays, we're getting better at predicting which cancers will do better with minimal therapy or if we need to break out the big guns."

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## Pet surgery

(Christina House / For the Los Angeles Times)

Veterinary assistants Cory Wakamatsu, left, and Talon McKee prep Coach, a 1-year-old Bernese mountain dog, for surgery with Brynn Schmidt, lead anesthesia technician, right, at the VCA West Los Angeles Animal Hospital.



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## Pet surgery

(Christina House / For the Los Angeles Times)

Lead anesthesia technician Brynn Schmidt and veterinary assistant Cory Wakamatsu prep Coach.



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## Pet surgery

(Christina House / For the Los Angeles Times)

Coach receives anesthesia before surgery.

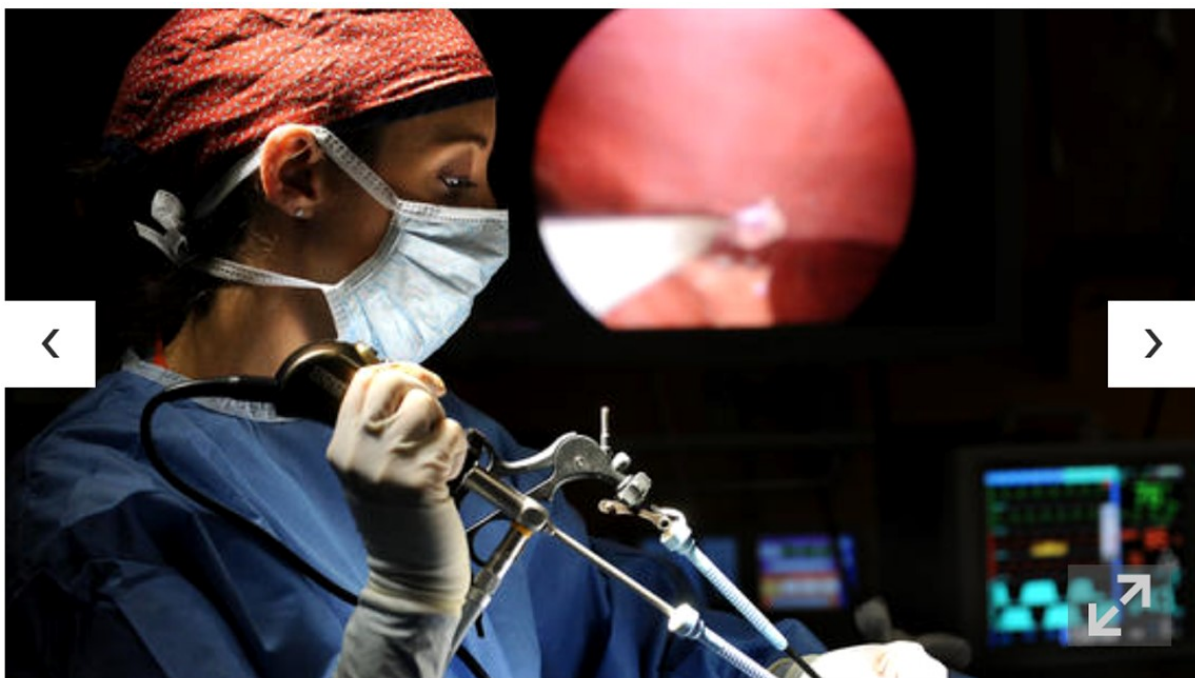


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## Pet surgery

(Christina House / For The Times)

Coach is moved onto an operating table for surgery.



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## Pet surgery

(Christina House / For the Los Angeles Times)

Dr. Nicole Buote, chief of surgery, performs laparoscopic ovariectomy, gastropexy and a stem cell harvest on Coach.



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## Pet surgery

(Christina House / For the Los Angeles Times)

Dr. Nicole Buote removes falciform fat from Coach,.



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## Pet surgery

(Christina House / For the Los Angeles Times)

Dr. Nicole Buote saves fat tissue removed from Coach for later harvesting of stem cells.



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## Pet surgery

(Christina House / For the Los Angeles Times)

Veterinary assistant Talon McKee wheels Coach out of the operating room after the dog had laparoscopic surgery and a stem cell harvest procedure.

Cancer treatment is one area that has seen a huge transformation — in part because of new imaging techniques that allow veterinarians to know exactly what they're dealing with. But high-definition imaging has also allowed for the development of minimally invasive procedures used to treat such conditions as kidney stones, collapsed airways, blood clots and broken bones.

High-tech tools that are standard equipment in human medicine, such as MRI machines, CT scanners and specialized scopes, have only recently become more widely used in veterinary medicine.

"We have the same technology available as human medicine; the only limiting factor is the cost," says Dr. David Proulx, head of radiation oncology at California Veterinary Specialists in Carlsbad. Medical equipment costs the same whether you use it on a person or a poodle, so most veterinary practices can't afford to invest in the latest machines. However, as human facilities upgrade to newer, better machines, veterinary hospitals can buy secondhand equipment.

There are far fewer research studies in veterinary medicine than there are in human medicine, Proulx says. Because drug companies don't make high profits from investing in veterinary treatments and government agencies are focused on human medicine, very little funding goes toward veterinary research. The exception is when animal model studies can be applied to human medicine — but even then, once trials have shown a medication to be effective in pets, drug companies don't often make the product available for veterinarians to use. They simply move on to developing the drug to market for humans.

And when new treatments are available, they often come at a high cost — raising difficult questions for pet owners. Few have pet insurance, and those who do have policies may find that they have high deductibles or are reimbursed for only a small percentage of expensive procedures. In the face of lifesaving treatments that may cost upward of \$10,000, even those who can afford to foot the bill may struggle with the question of how much their canine companion's life is worth.

The proliferation of options is what is so exciting about the recent developments in veterinary medicine, Chretin says. "Now we can say, 'Your dog has lymphoma.' We can give standard treatment with medicine. Or we can do antibody therapy in addition to chemotherapy. Or we can go crazy with a [bone marrow] transplant. If it's an older dog, or the owner doesn't have enough money, we can go more conservative."

Here is a glimpse into some treatments that have the potential to add high-quality years to your animal companions' lives:

### **Bone marrow transplant**

As far as cutting-edge treatments go, this is one of the most sophisticated available. Because it's so specialized and expensive (about \$20,000), it's not very accessible to most pet owners. But it offers a potential cure for lymphoma, a cancer of the white blood cells. Chretin is one of

the few veterinarians in the country who does bone marrow transplants. The procedure is exactly the same as that done in humans, he says. First, a dog is treated with a high dose of chemotherapy and a hormone that causes stem cells to release from the bone marrow into the bloodstream. A couple of weeks later, the dog is hooked up to a blood-separating machine that collects stem cells from the blood. The next day, the dog is treated with total-body radiation to wipe out all the white blood cells and, afterward, the harvested cells are infused back into the dog, where they will regenerate white blood cells in a, hopefully, cancer-free environment. The cure rate is about 40%.

## **CyberKnife radiation**

Because radiation doesn't distinguish between cancerous cells and normal cells, there is typically a limit to how much can be used without damaging healthy body tissues. CyberKnife is a system of robotic radiosurgery that delivers radiation so precisely that patients can tolerate a much higher dose with few side effects. While the machine takes continuous X-rays of a patient, a robotic arm delivers beamlets of radiation from 140 angles, all of which converge on the tumor with an accuracy of less than 1 millimeter. Because it is so precise, the veterinarian must know exactly where the tumor is located, says Proulx, who is one of only a handful of veterinarians in the world who are using CyberKnife in pets. "Not all pets and tumors are candidates, but we've certainly seen that in dogs with brain tumors we've been able to double the survival time." The procedure costs approximately \$12,000.

## **Stem cell therapy**

Stem cell therapy is one facet of veterinary medicine that has been pioneered ahead of human medicine. Dr. Nicole Buote, chief of surgery at VCA West Los Angeles Animal Hospital, uses stem cells harvested from fat to help pets that suffer from arthritis, torn tendons and degenerative spinal problems. She harvests patients' belly fat laparoscopically from a 2 centimeter incision, then sends the tissue off to VetStem, a company in San Diego, where it is processed with enzymes that separate fat cells from stem cells. VetStem banks some of the stem cells and sends the rest back to Buote. She can either inject the stem cells into a patient's joint or administer them through an IV, where they travel through the bloodstream and home in on areas of inflammation. They work both mechanically and chemically, by rebuilding new tissue in damaged areas as well as shutting down chemical processes that cause damage. Though stem cell therapy in humans has recently come under the scrutiny of the FDA, several studies have shown that stem cells extracted from fat tissue are effective in relieving arthritis and torn tendons in dogs and horses.

"This is not magic — it's not going to make a 10-year-old dog like a 1-year-old dog. But stem cells can stop inflammation in joints and can start to heal some of the tissues," Buote says. The initial harvesting and treatment cost is \$2,500, with subsequent injections every three to six months, at about \$200 per treatment. (The stem cell banking fee is free the first year, then \$150 annually.)

## Melanoma vaccine

The melanoma vaccine is another area where veterinary medicine is ahead of human medicine — and one that may have future human applications. Melanoma, a cancer of the melanocytes (pigment-producing cells), is one of the most common cancers found in dogs. Unlike in people, in dogs it has nothing to do with sun exposure and is usually found in the mouth. Since the melanoma vaccine is not preventive, the name is a bit of a misnomer, Proulx says. Sold under the trade name Oncept, it's used to lengthen survival time after a patient has undergone surgery, chemotherapy or radiation. The treatment is a form of immunotherapy, in which a strand of DNA that's encoded for a protein normally found only on melanocytes is injected into a dog. The protein stimulates an increased immune response in the dog, tricking its immune system into attacking the cancerous melanocytes. Oncept costs about \$2,800 for a series of four shots.

## Hormonal implants

If regular veterinary medicine is behind human medicine in terms of technological advances, exotic animal medicine is medicine's forgotten stepchild. There are very few research studies on exotic species, and those that are available are often limited to a single species. "A tortoise is not a snake, is not a lizard, is not a frog — and, even among one of those groups, they're all different species, from different countries," says Dr. Amy Wells, an exotic vet at the Avian and Exotic Clinic of Monterey. Plus, she adds, most pet owners are not willing to pay as much money to save the life of their iguana or parakeet as they would for their dog. So groundbreaking treatments in exotic animal medicine are a little less dramatic.

But one recent innovation has been able to span many species. Deslorelin is a contraceptive hormone that has been formulated into a sustained-release implant and is widely used as birth control in zoos. Only within the last couple of years has it become commercially available in the exotic pet market. The size of a rice grain, the implant is inserted beneath the skin with a wide-gauge needle. Over time the implant releases deslorelin, which acts on the pituitary gland to shut down the cascade of circulating reproductive hormones. Wells uses it to treat adrenal gland disease in ferrets, as well as to relieve parrots suffering from sexual frustration — often self-mutilating and becoming aggressive to their owners — when they are kept in captivity without a mate. She also frequently implants deslorelin in backyard chickens to prevent oviduct impaction — a life-threatening condition that occurs when eggs get backed up in the reproductive system and which costs about \$1,000 to surgically repair. The implant costs \$200 and lasts four to six months in a chicken; parrots should have a replacement implant yearly, ideally before the breeding season begins.

[health@latimes.com](mailto:health@latimes.com)

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