

VOMITING CAT | ALLERGIES | FLEA & TICK MYTHS



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A black stethoscope is resting on a green fabric surface, possibly a medical drape. The stethoscope's chest piece is positioned in the center, and its tubing loops around the frame. The background is a solid green color with a subtle texture.

Setting the Pace

Pioneering veterinarians find affordable pacemakers for pets **24**

Specialty Hospital
Survey, Part 2

Client and hospital satisfaction
with referral practices **31**

Setting the **Pace**





Veterinary cardiologists strive to make pacemaker implantation accessible

by Jen Reeder

COLORADO RESIDENTS BOON-LONG NG AND WING CHAU rescued their gray tabby, Fatball, when they were on vacation in 1998 and found a starving kitten in the desert. For 15 years, Fatball followed them everywhere, almost like a dog, and liked cuddling on the couch. So in March when he soiled the bed and had a seizure, they immediately sought emergency veterinary help.

“She told us Fatball had an AV heart block and he could basically die at any time,” Chau said. “We were really shocked.”

The couple’s family veterinarian referred them to Jan Bright, BSN, MS, DVM, DACVIM (cardiology and internal medicine), a veterinary cardiologist and professor of cardiology at Colorado State University’s James L. Voss Veterinary Teaching Hospital, who offered the option of implanting a pacemaker, something they hadn’t realized was even done for cats. After weighing the financial costs, potential life extension, and whether their actions were in the best interest of their cat, Ng and Chau opted for the pacemaker implantation surgery, which Bright performed on April 5, 2013.

Now Fatball is “back to normal,” cuddling and following his people

around the house—and not fainting or having seizures. Ng said the couple has “no regrets.”

“All in all, I’m very glad that we did it. Fatball is an indoor cat. He’s definitely got a couple more years of quality life left.... He’s having a great time enjoying life,” Ng said. “I’m just glad we have a top-notch program like CSU that’s not too far away from us.”

Veterinary cardiology and the demand for services like pacemaker implantation have continued to grow since James Buchanan implanted the first pacemaker into a pet dog in 1968 at the University of Pennsylvania.

“We have him to thank as a pioneer in the field,” Bright said.

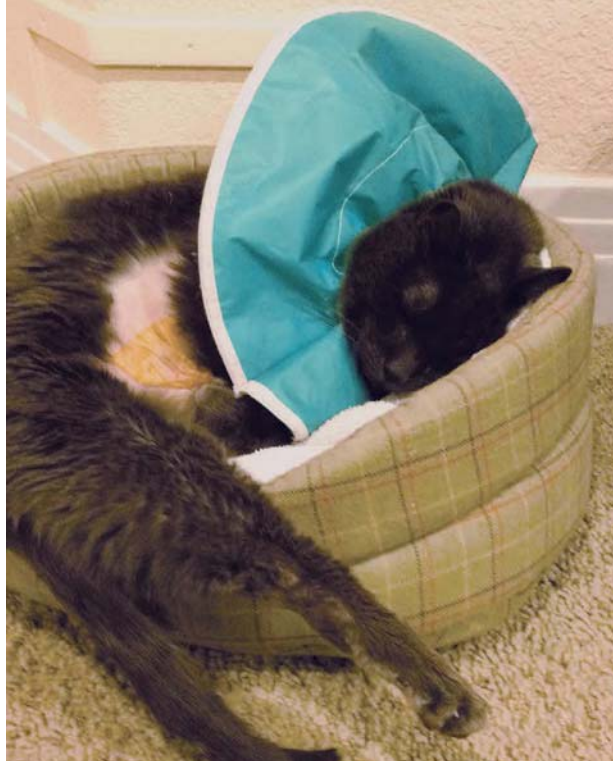
Getting creative

There are approximately 220 veterinary cardiologists board-certified in the United States, according to the American College of Veterinary Internal Medicine (ACVIM). Bright, who has been a veterinary cardiologist for 26 years and typically implants six or seven pacemakers in cats and dogs each year, said the cost of pacemaker implantation surgery varies across the country (around \$2,500 at CSU).

The key to keeping costs affordable to clients primarily depends on using inexpensive pacemakers. Until recently, there were no pacemakers manufactured specifically for veterinary use, and a brand-new pacemaker for humans costs \$5,000 to \$10,000—prohibitive for most clients. In 2010, Arizona-based company Dextronix began selling pacemakers for pets that cost \$1,500 to \$1,600 for generators and \$500 to \$600 for leads (which carry the electrical signal down to the heart from the generator and come in different lengths, diameters, and shapes). Even with the lower-priced pacemakers, the costs can still deter some clients from opting for the surgery.

“I think about 80–90% of the owners of the animals that I put pacemakers in probably couldn’t afford to have the pacemaker implantation performed even if they had to purchase from Dextronix,” Bright said.

Like many veterinary cardiologists, Bright has learned to be creative in finding sources of pacing devices. One favored option is buying generators and leads from CanPacers, a nonprofit to which pacemaker



Ng said the couple has “no regrets.”

manufacturers donate pacemakers with reduced battery life (usually under eight years) that can no longer be sold for human use, but are still suitable for veterinary use since animals have shorter lifespans. CanPacers then sells the generators and leads for about \$250 each; the proceeds support veterinary cardiology research.

Bright usually purchases leads from CanPacers since they must be new. Generators, however, can be reused, so to pass on further savings to her clients, she tries to use free generators.

“The ones I use I get primarily from mortuaries—it sounds kind of morbid—that have to remove them from human cadavers before they can cremate the cadaver,” Bright said. “So they send me boxes full of them.”

Bright’s team of volunteers sorts through the boxes, discarding defibrillator pacemakers since they are too large for companion animals, and checking the battery life of generators with programmers from three major pacemaker companies (Medtronic, Boston Scientific, and Cordis Corporation), keeping those with 5 or more years of battery life. Then they clean, sterilize, and reprogram them for veterinary patients.

Bright also receives donations of human pacemakers from a few cardiologists for humans.

“Again, the leads aren’t reusable, but they will send me the generators if they’ve had to remove it from a human patient to put in a newer or different model, or because there was an infection that contaminated the generator,” she said.

All this begs the question: Is it legal to use human pacemakers in animals? A spokesperson for the U.S. Food and Drug Administration (FDA) says that while there is no prohibition on using human pacemakers for animals, the practice is essentially “use at your own risk.”

“FDA’s Center for Devices and Radiological Health has stated in a compliance policy guide that ‘pacemaker reuse is an objectionable practice’ because ‘there is a serious question whether pacemakers can be properly resterilized following initial implantation due to the possibility of body fluids entering the terminal leads of the pacemaker. This also poses the problem of foreign protein matter to the second recipient,’” said Shelly Burgess, a press officer with the FDA’s Center for Veterinary Medicine. “FDA has not made any determination of whether reuse of a pacemaker in a different species poses similar or different risks.”

Changing technology

Bright said pacemaker implantation techniques have evolved over her 26 years of practice. For example, they used to be implanted surgically, but now most implantations in dogs are done transvenously. A lead is passed through the vein and into the heart, with the generator placed in the subcutaneous pocket in the dorsal aspect of the neck. In cats, an epicardial pacing lead attaches the lead to the outside of the heart instead of within.

Another change is that, instead of pacing at just one heart rate, generators can now pace at different heart rates depending on the activity of the person or dog, called rate-responsive pacing.

“If the dog needs to run across the backyard to catch a squirrel, his heartbeat can go up appropriately because he has a rate-responsive generator, instead of it just staying the same rate when he’s sleeping as when he’s exercising,” she said.

A major change occurring more recently is the use of more dual chamber pacemakers. Instead of one lead

pacing from a single site in the heart, one lead is inserted into an atrium and a second into a ventricle to create synchronous electrical activity between the two. Bright said it is possible that veterinary cardiologists may also adopt biventricular pacing in the future, with three leads: one each in an atrium and the left and right ventricles.

“It’s kind of state of the art to be thinking about dual chamber and even biventricular pacing,” Bright said.

Gaining ground with donations

Risa M. Roland, DVM, DACVIM (cardiology), veterinary cardiologist at AAHA-accredited Metropolitan Veterinary Associates in Norristown, Pa., said she expects to see a rise in veterinary cardiologists placing dual-chamber pacemakers if supplies allow.

“We would most likely be unable to place pacemakers in veterinary medicine without donated supplies,” Roland said. She said it is rewarding to implant pacemakers in dogs and cats with slower heart rates because their weakness, lethargy, and fainting generally subside and owners sometimes “feel as if they have their puppies or kittens back.”

“What was originally thought of as ‘slowing down with age’ can sometimes reverse completely once a pacemaker is implanted,” Roland said.

Whit M. Church, DVM, DACVIM (cardiology), veterinary cardiologist at Desert Veterinary Medical Specialists in Phoenix, Ariz., agrees. Church said one client sent him a video of their bulldog leaping off a dock into a lake after a successful pacemaker implantation surgery.

Church, a veterinary cardiologist since 2003, said he typically implants about 15 pacemakers per year in cats and dogs, mainly in dogs. He said cats sometimes have the same kind of arrhythmia that requires pacing as dogs have, but they don’t have as much trouble with symptoms like fainting.

“They have this escape rhythm that is just faster, so they don’t have as much trouble. The way I describe it is they have a better backup pacemaker than dogs,” he said.

Church said initially pacemaker companies donated pacemakers directly to him, but then they told him they



“Without donations, this procedure would be cost-prohibitive for most veterinary patients.”

—RISA M. ROLAND

were going to donate only to CanPacers. He likes to support CanPacers by purchasing generators and leads from them when he can, but he had difficulty getting what he needed about 4 years ago when some companies were donating to humans in developing countries instead of CanPacers. He even looked into buying a new pacemaker from St. Jude Medical for around \$10,000.

“We were really scrambling,” he said.

Fortunately, he receives many pacemakers from people who note in their will that they want their pacemaker donated to a dog.

“Sometimes I’ll get them in the mail, just randomly, because right now I’m the only one in Arizona that puts pacemakers into dogs,” he said.

He has borrowed programmers from St. Jude and Medtronic that his veterinary technicians use to check pacemaker function before a rigorous cleaning and sterilization process. He now uses CanPacers frequently, but still sterilizes their pacemakers because companies donate them partly because they have outlived their sterilization for the human field.

Church said the pacemaker implantation surgery, which typically costs \$3,200 including the device, is performed only on about half the dogs that really need a pacemaker—possibly less. He said age and cost are a factor, as well as a misconception about the surgery.

“It’s not really that invasive. The procedure that I do, I do as an outpatient. I don’t even keep them overnight,” he said. “It’s minimally invasive and doesn’t put the patients through a lot of pain and suffering like a lot of surgeries do.... It sounds like this huge procedure, but it’s really not that big of a deal.”

Veterinary cardiologists Megan McLane, DVM, DACVIM (cardiology), and Maggie Schuckman, DVM, DACVIM (cardiology), have been working together since September 2012 to establish an interventional cardiology unit at Care Center in Cincinnati, Ohio. McLane said they buy generators and leads from CanPacers to help keep the cost of the surgery down (typically around \$3,000).

“Cost is definitely a huge factor in veterinary medicine, I find. Especially when you get into the specialist field, we have to watch how expensive we get,” she said.

McLane said they’ve never had a client use pet insurance to pay for the surgery because they wait until after the diagnosis to apply for it and are then disqualified by a preexisting condition. (Some pet insurance policies cover pacemaker implantation.)

McLane and Schuckman said veterinary cardiologists will be doing more pacemaker implantation in the future, and they anticipate an increase in dual pacing since dogs are living longer and their owners want pacemakers that work more efficiently.

“Pets have gone from being backyard sort of companions to really being part of the family,” Schuckman said. “The more that happens, the more we’ll be doing this, which is great and even more rewarding.”

Eva Sikorska, DVM, DACVIM (cardiology), veterinary cardiologist at Pittsburgh Veterinary Specialty and Emergency Center in Pittsburgh, Pa., said she’s seen an increase in client interest in pacemaker implantation over the past few years as people learn about options in

specialty medicine. She said she works closely with referring veterinarians to discuss the best treatment options for clients, and that family veterinarians play a crucial role in helping animals with heart conditions get the treatment they need.

“I think the primary care veterinarian is an integral part in all of that because most of these clients, by the time they come to us, have known their family veterinarian for years. They have a very, very special relationship with that person, and they trust that person,” Sikorska said.

She said she encourages family veterinarians to pick up the phone and call specialists in their area to discuss

cases together because most veterinary cardiologists are happy to chat about treatment options.

“The ultimate goal is finding the best care for that patient. The way you’re going to get there is great teamwork and collaboration,” Sikorska said. “The family veterinarian might not be a specialist, but by no means does that undermine just how important their role is in all of this.” ✱



Jen Reeder writes frequently about pet issues from her home office in Durango, Colo., which she shares with her husband and their Lab mix, Rio.

For More Information:

American College of Veterinary Internal Medicine: acvim.org; acvimfoundation.org

CanPacers: canpacers.org

Dextronix: dextronix.com/pacemakerdogsstentscats

The EEOC is after me? An employee sued the practice?

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Learning facilitator: **Laura Lapidus, Esq.**,
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