Cancer Strides For Dogs Assist Human Therapy

By Justin Matlick

WHEN SCOTT Friberg's dog, a wire fox terrier named Bailey, was diagnosed with sinus cancer in 2003, the prognosis was bleak. Bailey had a tumor in his sinus cavity that was too large to be removed, and a veterinary oncologist told Mr. Friberg that radiation treatments could affect the surrounding areas, causing blindness and brain damage.

The doctor advised Mr. Friberg to let the cancer run its course, and said Bailey, six years old at the time, might eventually have to be put to sleep. "I was devastated," Mr. Friberg says.

Instead of giving up, Mr. Friberg, a manager at a commercial real-estate-tax services firm in Dallas, drove Bailey to the University of Wisconsin and enlisted him in canine clinical trials for an experimental radiation treatment.

Called tomotherapy and owned by **TomoTherapy** Inc., Madison, Wis., the treatment is designed to zero in on a tumor without affecting its surroundings, and researchers hoped the tests on pet dogs could pave the way for human trials.

Bailey

When volunteering his dog for testing, Mr. Friberg says his first priority was to save Bailey, but he found solace in the possibility of also helping people. "It's a win-win," he says.

In Bailey's case, after 10 radiation treatments, the tumor shrank enough to eventually be removed, and a runny nose is his only lasting side effect. What's more, tomotherapy has now been cleared for widespread human use and is in use across the country.

Variations of Bailey's story are becoming common as more veterinarians, medical institutions and pharmaceutical companies team up to study and treat canine cancer, with hopes it could lead to new therapies for people. Dogs are closer genetic cousins to people than mice, and dogs and people develop many of the same cancers.

With rare exceptions, pet owners pay for diagnosis and for the tests necessary to see if a dog is eligible to participate in a clinical trial. After that, all costs are typically covered by the research organization and or drug company.

Some researchers caution that it's too early to tell how large a role dogs will play in combatting human cancer. "You have to be very careful about moving from species to species," says David Vail, a veterinary oncologist at Colorado State University's animal cancer center. But the prevailing out-

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Oncologists Study Dog Cancers

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look is optimistic. "We can solve these [human and canine] problems in parallel, because dogs get cancer for the same reasons humans do," says Jedd Wolchok, an oncologist at Memorial Sloan-Kettering Cancer Center in New York, which is collaborating with the Animal Medical Center, a New York veterinary hospital, to test vaccines on pet dogs.

Niels Pedersen, a professor of veterinary medicine at the University of California, Davis, notes how times have changed. "When I was in vet school," he says, "the object was to diagnose the cancer and put the animal to sleep."

That was 30 years ago. Researchers attribute the change to a variety of factors, including new biological cancer treatments, the increasing availability of the dog-specific reagents needed to examine cancer cells, and the sequencing of the dog genome, which was completed last year.

'Dogs get cancer for the same reasons humans do,' says a New York oncologist.

Another factor: Americans' increased willingness to pay for treatments that prolong pets' lives. Americans spent $19 billion in veterinary clinics in 2001, the most recent year for which data are available, up from $11.1 billion in 1996, according to the American Veterinary Medical Association. Much of this spending was on cancer, the leading cause of death from disease in adult dogs.

The University of California, Davis, recently completed a $15 million veterinary clinic, about two-thirds of which is devoted to cancer care and research, including a surgery center and facilities for radiation treatments and chemotherapy. But Dr. Pedersen says that the veterinary school conducts joint research with the university's medical school and that the clinic was built with human research in mind. "Most of the available research money has a human twist," he says, "and the vet school naturally wants to tap into that."

Roughly four million dogs are diagnosed with cancer each year. One canine cancer is melanoma, and strides are being made in treating it. Philip Bergman, head of the Donaldson-Atwood Cancer Clinic at New York's Animal Medical Center, who is working with Memorial Sloan-Kettering's Dr. Wolchok on the vaccine test, says canine melanoma "is probably the best model out there for human melanoma." This and other naturally occurring cancers are more complex than those made in a lab and injected into rodents, making them a better bellwether of how human cancers might respond to treatment.

The melanoma vaccine uses DNA from mice or humans to trigger an anti-cancer immune response in dogs. The key ingredient is tyrosinase, a black pigment found in melanoma cells. Injected into the dog, the tyrosinase transforms into a protein, which is seen as foreign because it is from a different species. As the immune system responds, it attacks the tyrosinase found in the melanoma, breaking it down.

In four clinical tests, Dr. Bergman says the drug quadrupled the average survival time of afflicted dogs, and eradicated some cancers, with few to no side effects. It is licensed for animal use by the animal-health firm Merial, a joint venture of **Merck** & Co. and **Sanofi-Aventis** SA.

The U.S. Department of Agriculture is expected to approve the vaccine for widespread animal use sometime in the next year, and Dr. Wolchok says the canine trials "accelerated the process" of developing a similar drug for humans. "They provided us with some very important safety data," he says, which helped land the Food and Drug Administration's permission to begin human trials.

On other fronts of cancer research, pet dogs have already made important contributions. They were integral to the testing of Quadramet, a bone-cancer drug developed by **Cytogen** Inc., which has been on the market since 1997. University of Wisconsin researchers used dogs to test an inhaled form of chemotherapy that is now in Phase I human testing. More recently, researchers at Purdue University's veterinary school have shown that dogs' cancer risk is linked to exposure to lawn chemicals.

Chand Khanna, head of the comparative oncology program at the National Cancer Institute's center for cancer research, says pet dogs can help drug companies make better judgments about whether to move on to human testing.

The NCI center was launched in 2003 to help push pet dogs into the cancer-research mainstream. By tying veterinary schools and clinics into a nationwide consortium, Dr. Khanna hopes the center can help pool their caseloads, providing a sample population needed for large-scale trials. "We want to take away a lot of the unknowns involved in human trials," he says.

As for Bailey, Mr. Friberg's wire fox terrier, doctors now expect him to live out his breed's normal lifespan. "He's back to ruling the roost," Mr. Friberg says.