

**W**hile people have long recognized and used the dog's incredible sense of smell for many useful purposes, a whole new dimension unfolded in 1989 when two British dermatologists described a case where a pet dog kept returning to a skin growth on its owner's leg. A biopsy confirmed that the growth was a malignant melanoma, leading to an intriguing possibility: could a dog's nose actually detect cancer?

Since then, clinical trials have shown that dogs can be successfully trained to use their noses for detecting several cancers in people including breast cancer, lung cancer, malignant melanoma of the skin, and bladder cancer.

And if dogs can detect cancer in humans, are they also able to track down the disease in other dogs? That's a question that Dr. Elizabeth Snead of the Western College of Veterinary Medicine hopes to answer with the support of a research grant from the College's Companion Animal Health Fund.

Over the next three years, Snead will team up with three other WCVI researchers: Drs. Susan Taylor, Monique Mayer and Joe Stookey. Her fifth team member is Dr. Jim Walker, a sensory specialist who was previously affiliated with the University of Florida. As part of the project, researchers will train four dogs to distinguish — by scent alone — urine samples collected from dogs diagnosed with *transitional cell carcinoma* (TCC) of the urinary bladder.

### Timely tracking of bladder cancer

TCC is the most common bladder cancer in dogs, accounting for up to two per cent of all canine cancers. Snead says clinicians regularly see the disease at WCVI's Veterinary Teaching Hospital where about 10 to 12 cases are diagnosed per year. Surgical treatment works well if TCC is detected early, but unfortunately, most cases aren't detected until it's too late for treatment options. On average, dogs diagnosed with advanced TCC only survive for about three to 12 months.

To make a definitive diagnosis of this cancer type, veterinarians must conduct a surgical biopsy to obtain tissue for histopathological exams — and these tests are usually done only on dogs that already show significant clinical signs of the disease.

If practitioners had access to a highly sensitive, specific and non-invasive test, Snead believes that would help to improve the chances of diagnosing the cancer early on so more dogs could be successfully treated.

But besides the chance to improve testing for TCC, there are other reasons that make this a compelling subject for a study. Since dogs' urine samples are easy to collect and store, Snead says the research team will work with private veterinary clinics across Western Canada to gather at least 40 canine urine samples for the pilot project.

"With any luck, we will have enough left from the collected samples to make a start on other studies that might look at such issues as identifying the marker the dogs are detecting. That would be very useful to know because researchers could then start working to try to develop a test for it. Eventually, we would like to find out if it's the same marker in dogs as in humans by having our samples evaluated by sniffer dogs trained to identify TCC in human urine."

During the study's first year, the research team will focus on collecting enough urine samples from dogs diagnosed with TCC, along with another 80 to 90 control samples from healthy, non-medicated dogs that have no signs of urinary tract disease.

### Training dogs to "sniff away"

Taylor, an experienced dog trainer, will be in charge of training the sniffer dogs — a process that should take about four weeks. She will use a



**Does Fido's  
NOSE Know?  
The ideal tool for sniffing  
out canine bladder cancer  
may be right beneath our  
dogs' noses. *By Roberta Pattison***

food reward system to train four young dogs with basic obedience training. While the dogs will be of all different breeds and sizes, they will all have one thing in common: an eagerness to sniff objects.

During the first stage of training, a handler will bring each dog into a room and give the animal unlimited time to sniff four "control" samples and one holding a urine sample from a TCC-diagnosed patient. As soon as the dog sniffs the patient's sample, the handler will command the dog to sit and the scientist will hand out a food reward. The training team will repeat the process in the second stage, but during this part of training, only the researcher will know the identity of the patient sample. The team will phase

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out the food reward during the third and final stage.

Once the sniffer dogs have completed training, the research team will use single-blind and double-blind trials involving plain water as well as urine samples from dogs diagnosed with TCC and from control dogs. As much as possible, the research team will match up the urine samples from control dogs and TCC-affected dogs in terms of sex and age.

“We’re not planning on using any unidentified samples in this first study,” points out Snead. “But if all goes well, we do hope to introduce samples from dogs with urinary tract infections or inflammation to see how our sniffer dogs do with that variable.”

### How does the nose rate?

The team will compare the accuracy and sensitivity of the dogs’ olfactory detection with traditional diagnostic methods where clinicians use *cytology* (cell-based) tests to evaluate urine and histological techniques to test tissue biopsy samples. The team will also compare the outcome of the sniffer dogs’ trials to the results collected from a newly developed veterinary bladder tumor antigen test.

Snead can’t predict the project’s outcome — but the recent results from a small study may offer some insight into what researchers can expect from the WCVI investigation. In that study, researchers trained dogs to distinguish between urine samples from healthy “control” subjects, from



people diagnosed with TCC, and from humans with other inflammatory but non-malignant disorders of the urogenital tract. The dogs correctly identified the TCC-affected urine samples 41 per cent of the time. That accuracy rate was lower than the rate recorded in other studies involving other human cancer types, but still, Snead says the percentage is statistically significant.

“We want to keep the study tight, and make specific comparisons with standard tests,” stresses Snead, “but over the years, you learn to expect the unexpected. For example, in one of the human research studies, the dogs kept going back to one of the controls. It turned out the dogs were right: further testing showed that the person had a cancer that had gone undetected until that point.”

Now, what if dogs can repeat the favour for their own kind? Well then, “man’s best friend” may just turn out to be his own best friend as well. **V**

*Roberta Pattison is a freelance writer who is a regular contributor to the national publication, Dogs in Canada. Recently retired from grain farming, she still lives on her farm near Delisle, Saskatchewan.*

**AT LEFT:** “Oakley.” Photo by Michelle Braun of Winnipeg, Man. Courtesy of the 2005 Great Manitoba Dog Party Photo Contest, organized by the Manitoba Veterinary Medical Association. **ABOVE:** Dr. Elisabeth Snead examines one of her canine patients at the WCVI Veterinary Teaching Hospital.



Dr. Jennifer Stelfox and Tessie

**ONCOLOGY ADVOCATE JOINS CAHF:** Dr. Jennifer Stelfox, a 1986 graduate of WCVI and a long-time advocate for pet radiation oncology therapy in Western Canada, is the newest member of the Companion Animal Health Fund’s advisory board.

Stelfox, whose practice is based in Spruce Grove, Alta., steps in for Dr. Greg McFetridge, a small animal veterinarian in Edmonton, Alta., who served more than a dozen years on the CAHF board.

Besides bringing more than 20 years of professional expertise to the board, Stelfox can share her experience with the Animal Cancer Therapy Subsidization Society ([www.actsalberta.org](http://www.actsalberta.org)). ACTSS a non-profit organization in Alberta that concentrates on making cancer therapies affordable for pet owners.

In 2001, ACTSS (previously known as the Veterinary Cancer Institute) donated its cobalt radiation machine to WCVI in support of the College’s pet radiation therapy centre. Working with the College, ACTSS promotes oncology training for veterinary students and practitioners out in the field to ensure that all veterinarians are aware of available oncology treatment options for pets. Stelfox, one of VCI’s original founders, now serves as ACTSS’ president.

Members of CAHF’s advisory board ensure that WCVI’s companion animal health research and training programs continue to be valuable and relevant to veterinarians, pet owners and companion animal associations across Western Canada. These volunteers also help to promote the goals and achievement of the Fund. To view the complete list of CAHF advisory board members, visit [www.cahf.usask.ca](http://www.cahf.usask.ca) and click on “Organization.”