

Early Warning for a

Deadly Cancer

DNA screen can detect tumors before it's too late.

By Penny Leigh

Dog trainer Denise Nord could not have been happier as she drove home to Minnesota from an obedience trial in Canada. Her Beagle had won High in Trial with a nearly perfect score, defeating tough competitors of more traditional obedience breeds, like Golden Retrievers and Border Collies.

Back home, Chelsea would be competing in the first AKC agility trial in Minnesota and making her debut in the advanced obedience class of Utility. “She was really just peaking in her performance career,” Nord says.

There was just one thing concerning Nord. Chelsea had a urinary tract infection

(UTI) that refused to clear up. When she returned to her veterinarian, he expressed alarm that the infection had not improved with antibiotics and sent samples to the University of Minnesota School of Veterinary Medicine. Tests ensued, and doctors discovered a tumor in Chelsea’s bladder.

“The tumor was in the trigone area of the bladder—the worst place for it to be in terms of longevity because the tumor prohibits the bladder from emptying to some degree (or at all),” Nord says.

The vet school prescribed the best medication known for bladder cancer, but Nord says it was clear it was not working. The tumor was too advanced. Ten days later,

Nord said goodbye to Chelsea, who was only 8½ years old.

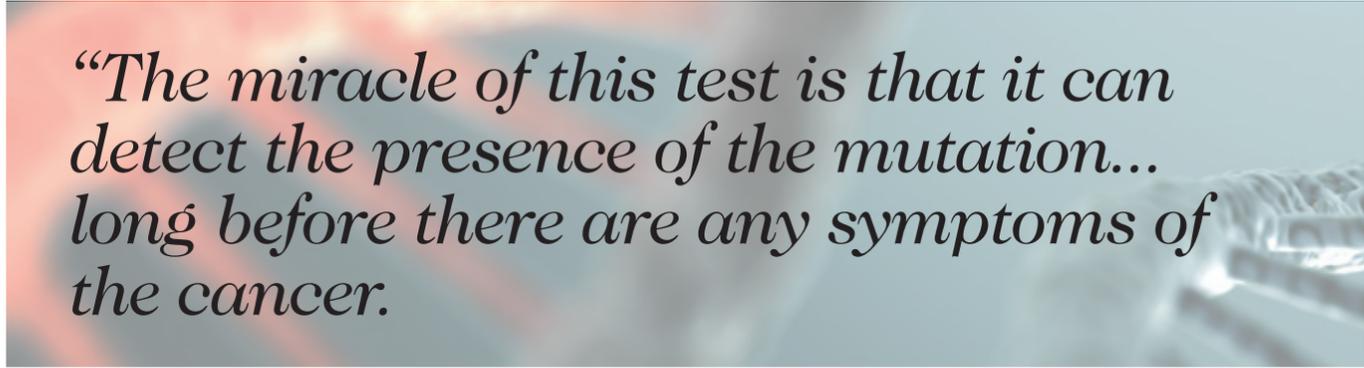
This sad story, which occurred in the mid-1990s, has been typical for many dogs with bladder cancer. Dogs often have urinary tract symptoms, including frequent urination and straining to urinate, that are shared with other common conditions. This can result in several cycles of antibiotics, along with repeated urine cultures. By the time a diagnosis is made, the cancer has advanced and spread, limiting successful treatment options.

But today, there is a new way to detect bladder tumors. The CADETSM BRAF Mutation Detection Assay is the first

early-detection system for the type of bladder cancer known as Canine Transitional Cell Carcinoma/Urothelial Carcinoma (TCC/UC).

The CADET test is easy for owners, who collect urine samples and ship them to a laboratory. The kit even provides shipping containers and labels.

“A single mutation in the canine BRAF gene is present in 85 percent of confirmed TCC/UC cases. The test identifies tumor cells carrying this mutation that are shed into the urine,” says the test’s creator, Dr. Matthew Breen, North Carolina State University Distinguished Professor of Comparative Oncology Genetics and co-founder of Sentinel Biomedical. “The test can detect



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as few as 10 abnormal cells in a urine sample, which allows the cancer to be detected much earlier than traditional methods, and often several months before the dog has any symptoms.”

TCC/UC is an invasive cancer of the bladder that is typically diagnosed in middle-aged to older dogs, says Marcia Dawson, DVM.

“While it is not one of the most common cancers in dogs, more than 20,000 dogs are estimated to develop TCC each year with approximately 50 percent of cases involving aggressive spread of the disease to other organs,” says Dawson, who is chairwoman of the Health Trust Fund for the Scottish Terrier Club of America.

Scottish Terriers, Beagles, West Highland White Terriers, Wire Fox Terriers, and Shetland Sheepdogs are among the breeds with a high risk for TCC, but any dog can be affected.

“Scotties have the unfortunate distinction of being the ‘poster dog’ for TCC, having an 18–20-fold higher risk. Those of us with

Scotties are all too familiar with the typical course of TCC/UC,” Dawson says. “First, the owner notices unusual symptoms in her dog, such as blood in the urine, more accidents in the house, and the Scottie taking a longer time to urinate. The veterinarian will prescribe a course of antibiotics, and for a few weeks the Scottie seems to be fine. But inevitably the symptoms return, and another round of antibiotics is prescribed. And again, the symptoms return. Meanwhile, if there is a tumor forming in the bladder of this Scottie, time is the enemy...”

“The lesson for those of us who own high-risk breeds is that we cannot afford the luxury of waiting around to see if another course of antibiotics might work.”

An important weapon in the fight against TCC is early diagnosis, and that is the chance that the CADET test offers. Sentinel Biomedical has teamed with the American Kennel Club to offer the test on a subscription basis. Owners are encouraged to start screening, especially in high-risk breeds, at

age 5 to 6 years.

A CADET BRAF Mutation Detection annual subscription provides a kit that allows three tests to be performed for the same dog over the course of a year. Owners collect urine from their dogs and ship to the Sentinel laboratory once every four months.

The results come back within two weeks, and a report is sent to the dog’s veterinarian. If the BRAF mutation is detected, the owner should schedule an appointment with their veterinarian as soon as possible.

“The miracle of Dr. Breen’s test is that it can detect the presence of the mutation in remarkably few cells shed in urine, long before there are any symptoms of TCC/UC, long before blood is noticed in urine, before the straining to urinate and frequency of urination, and even in some cases, before anything can be detected on ultrasound. In short, this new CADET test is the gift of time,” Dawson says.

Some national parent clubs of at-risk breeds assisted with testing and provided feedback on the CADET screening. When the National Beagle Club contacted Nord and asked her to volunteer, she jumped at the chance to fight the dreaded disease.

“I was part of the collection and shipping portion of the trial, looking at the best ways to collect the urine and how the samples handled shipping from Minnesota to North Carolina—in the winter,” Nord says. “I

shipped an awful lot of urine samples from three of my dogs for a few weeks.”

Shortly before Nord participated in the BRAF testing, her 16-year-old Beagle, Tory, began leaking urine. Antibiotics were not working.

“Due to my prior experience with TCC, I suspected that was what it was and was not at all surprised when Dr. Breen’s lab called to give me the news. They paid for an ultrasound, and the tumor was determined to be on the opposite end of the bladder than Chelsea’s.”

Tory started taking an oral medication. Even though there were surgical options, Nord elected not to explore those due to Tory’s advanced age. Five months later, Nord told Tory goodbye.

But Nord’s younger Beagles will continue to be tested so she can be as proactive as possible in detecting TCC in her dogs.

“I absolutely would recommend this test—a noninvasive way to detect TCC at a very early stage,” she says. “Tumor location will be a factor in prognosis but early detection might open up more treatment alternatives for all dogs.

The CADET BRAF Mutation Detection Assay is available in the AKC Store (shop.akc.org).

Further information is available at SentinelBiomedical.com. **FD**