Veterinary oncology research strives to advance the diagnosis and treatment of cancer in dogs, cats, and other species. Across the nation, veterinary schools and other institutions are conducting clinical studies on a variety of cancers, many of which hold promise for both animals and humans.
Approximately 1 in 4 dogs will, at some stage in their life, develop neoplasia, reports the American Veterinary Medical Association (AVMA). Almost half of dogs over the age of 10 will develop cancer, says the AVMA. Dogs get cancer at roughly the same rate as humans, while there is less information about the rate of cancer in cats.

At the forefront of oncology research are veterinary nurses, whose role encompasses everything from patient intake to the administration of experimental drugs to consoling clients whose pets have passed away by reminding them that their sacrifice could lead to a breakthrough that will benefit others in the future.

“[Veterinary] nurses provide amazing care, and really advocate for their patients,” observes Sarah Lahrman, RVT, oncology supervisor with the Purdue University Comparative Oncology Program. “I think that’s one of the most awesome things about this job.”

The scope of oncology research is broad. At Colorado State University College of Veterinary Medicine’s Flint Animal Cancer Center (csuanimalcancercenter.org/clinical-trials), an estimated 30 clinical studies are investigating experimental treatment modalities for lymphoma, soft tissue osteosarcoma, and other tumors. Some studies are designed to gauge a new treatment’s efficacy and side effects, while others may determine the appropriate dose for a promising new compound, says clinical trials technician Kara Hall, CVT.

“The studies at CSU change pretty consistently, depending on how many patients are needed,” adds Hall’s colleague, Lindsay Carroll, CVT, VTS (Oncology). “When one study closes, new ones are opened. It keeps us busy.”

One large study ongoing at the University of Minnesota College of Veterinary Medicine’s Clinical Investigations Center (vetmed.umn.edu/centers-programs/clinical-investigation-center/current-clinical-trials) is looking into canine hemangiosarcoma, with an emphasis on splenic hemangiosarcoma, notes research study technician specialist Amber Winter, CVT. The center has also performed clinical trials investigating new treatments for canine B- and T-cell lymphoma, and feline squamous cell carcinoma. “Targeted therapy is a big area of research here,” Winter says.

Transitional cell carcinoma (TCC) and canine lymphoma are primary study subjects at the Purdue University Comparative Oncology Program (purdue.edu/cancer-research/index.php), reports Lahrman. Like many other institutions, Purdue is working on translational research in association with the National Institutes of Health, Johns Hopkins University, Duke University, and other institutions.

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“High-grade transitional cell carcinoma in canines is very similar to high-grade TCC bladder cancer in humans,” Lahrman explains. “Much of the work we have done regarding bladder cancer can be transcribed to human medicine. In fact, our work with the drug piroxicam for canine TCC helped the drug make its way into human medicine.”

Comparative Oncology Research

Purdue is one of many veterinary schools involved in comparative oncology, which evaluates animal cancer research to see if it can translate to human medicine. The Veterinary Health Center at the University of Missouri in Columbia, for example, is a member of the Comparative Oncology Trials Consortium (COTC), which comprises 22 sites nationwide. According to Deb Tate, RVT, VTS (Oncology), Clinical Trials Coordinator for Oncology Service at the University of Missouri (vhc.missouri.edu/small-animal-hospital/oncology), canine osteosarcoma is the subject of a large COTC trial containing 3 arms: dogs that underwent standard of care (amputation followed by chemotherapy), dogs that received standard of care and a novel chemotherapeutic agent, and dogs that received standard of care and a listeria vaccine believed to stimulate the patient’s immune system.
“Immunotherapy is a huge thing in cancer research right now,” Tate reports. “We were recently involved in an immunotherapy study with ELIAS Animal Health in Olathe, Kansas. It was the first trial of its kind regarding osteosarcoma, and the enrolled patients have surpassed the median survival time of the dogs receiving standard of care, which is unheard of.”

It’s important to note that these comparative oncology programs are not using companion animals specifically bred for the research; rather, pet owners are enrolling their pets in these clinical studies.

“There has been renewed interest in studying tumors that spontaneously develop as a result of aging in companion animals (dogs mostly), because they share many characteristics with human cancers, such as histologic appearance; tumor genetics; biologic behavior; molecular targets; therapeutic response; and acquired resistance, recurrence, and metastasis,” says Dr. Michael Kastan, executive director of the Duke Cancer Institute. 2

The Canine Comparative Oncology and Genomics Consortium (ccogc.net), part of the NCI Center for Cancer Research, facilitates collaborations to study cancer in dogs. The Pfizer-CCOGC Biospecimen Repository has amassed 60,000 specimens from about 2000 canine patients with cancer of more than 100 breeds—52% male and 48% female. They include 7 types of cancer (osteosarcoma, lymphoma, melanoma, pulmonary tumors, mast cell tumors, soft-tissue sarcomas, and hemangiosarcomas) and 9 types of specimens, among them frozen tumor tissue, plasma, and normal tissue. The CCOGC has developed a mechanism to share reagents and resources as well as to develop a biospecimen repository, which is accessible to the public based on scientific merit. 2

THE ROLE VETERINARY NURSES PLAY
The role of veterinary nurses and technicians in veterinary oncology research is all encompassing, and it’s not hyperbole to say that such work would be next to impossible without their involvement. The veterinary nurses and technicians interviewed for this article collectively recited a lengthy list of responsibilities that included soliciting subjects for studies, patient intake, conducting histories and physicals, preparing subjects for biopsies and other procedures and assisting with same, collecting and processing tissue samples, administering experimental drugs, monitoring subjects and collecting data, ensuring data is correct and inputting data into the system, keeping clients apprised regarding their pets’ status, consoling clients when their pets don’t survive, and much more.

“I basically am the manager of the study I’m helping the investigator with,” says Winter. “Whatever they need, I am there to help. I wear many hats, both administrative and clinical. The investigator will develop the protocol, present it to us, and we make sure it gets done the way they want it done.”

Veterinary nurses also sometimes work with veterinary nursing students and DVM students as they rotate through their services. “We are involved in teaching them things like general history taking, blood draws, catheter placements, anesthesia, and setting up for biopsy procedures,” notes Lahrman. “They may even be involved with our research patients.”

Understandably, the relationship between veterinary nurses and study investigators is a tight one. “We get to know each other very well,” Winter says. “Once an investigator starts a study, we are usually in contact with them on a daily basis. The relationship is different with each investigator. Some investigators are surprised at the scope of our capabilities.”

Equally strong is the relationship between veterinary nurses and patient owners. Often, having a pet enrolled in a clinical study means the owner must visit the facility more frequently for appointments, which gives the support staff more opportunities to get to know them better.

“I spend a lot of time not only discussing what’s going on with the patient, but how the owner is coping with having a pet with cancer,” says Hall. “I enjoy getting to know my clients and learning about their families and life outside the hospital.”

Adds Carroll: “Kara and I are the frontline of our service, so we are the first people our clients see and often the last they see as well. As we learn more about them, we establish a trust which helps ease the stress and pain of their animal going through cancer treatment.”

Though they work jointly, Hall and Carroll tend to establish different relationships with their clients, Carroll says. “Kara, being a mom, likes to find out
more about the client’s family, how many kids they have, what they do,” she explains. “I am more about what they like to do when waiting around, or other animals in the house, or how long they have had their dog and how they found him or her.”

Because of this close relationship, clients tend to lean hard on support staff, especially when difficulties arise. “I am their constant,” observes Tate. “The clients know that when they call here, they will always get me. We’re the even keel of care, and the person they turn to when they have questions or concerns.”

Cancer is a very common disease, so it’s not unusual for clients and their pets to be on their journeys at the same time. Hall had a subject named Leo who was being treated for lymphoma while his owner was being treated for breast cancer. “At one time, they were receiving the same chemotherapy at the same time,” Hall says. “I always checked on [the owner] to see how she was feeling, listen to what she was going through, and be there for her regarding her concerns for Leo.”

Lahrman recalls a Shih Tzu named Ellie Mae that was being treated for a nasal tumor, and whose owner shared with Lahrman her own cancer story. “She told me how Ellie had helped her get through her treatments, including long days of just laying in bed with Ellie at her side,” Lahrman says. “She of course had concerns about side effects from Ellie’s treatment since she knew how treatments has impacted her. She wanted to be there for Ellie like Ellie had been there for her. They had a very special bond.”

**THE CHALLENGES AND THE REWARDS**

Working in veterinary oncology research can be challenging and wearing, but most veterinary nurses say they get a lot out of their involvement—especially if cancer has touched them personally. Hall, for example, lost her aunt and grandfather to cancer, and is a cancer survivor herself. “Being a part of research that will help humans as well as pets is very satisfying,” she says. “I work with a fantastic team of people who have dedicated their lives to cancer research. I am honored to be a part of that team.”

Others derive great personal satisfaction from being able to calm the often deep concerns of clients. Observes Winter, “When a pet comes in with cancer, the news can be devastating for the owner. Being able to place their pet in a clinical trial gives them a glimmer of hope in their time of darkness. The most difficult part of my job is having to tell an owner that their pet isn’t eligible.”

The emotional support aspect of her job also drives Tate. “Their animal has exhausted all of the conventional therapies, and the clinical trial is their last hope,” she notes. “Sometimes things work, and sometimes they don’t. The greatest upside for me is when we offer a therapy and it does work, and we have been able to fulfill the hope the client was looking for.”

There are, of course, challenges to the job, both emotional and otherwise. Foremost for many is having to euthanize patients and console their owners, especially if their relationship with the client has been long-term. “You always have to be cognizant that you don’t become burned out, because it is a very emotional job,” Tate says. “You get attached to your patients, and most of them eventually die. We see patients and clients weekly or monthly for a year or two, and suddenly the patient is no longer with us and the relationship ends. Sometimes that is really trying.”

Equally difficult is knowing that a patient would benefit from participating in a clinical trial, but the client declines for financial or other reasons. “That can be frustrating because you know you can help the animal,” Tate says. “We have to keep in mind that it’s not that the owner has made the wrong decision; it may be the right decision for them and their family.”

Finding the time to do all that their job requires also can be difficult. “Each trial has different requirements that must be done at each visit,” Hall notes. “We may have 8 patients, each in a different trial in a day. We
“Veterinary oncology research provides an awesome opportunity to grow, not only as a [veterinary] nurse or technician, but as a person.”

References

have to be extremely organized and efficient in order to get all of our work done in a timely manner.” Detailed checklists help keep things running smoothly.

And then there’s the issue of funding—or a lack of it. Carroll laments that unlike human medicine, veterinarians often don’t receive the necessary grants from large companies needed to conduct state-of-the-art research. “Our doctors may be working off a much smaller budget, and thus don’t have all the bells and whistles they need or would like,” Carroll says. “However, I do believe that the research we are doing with what we have is still incredible and beneficial.”

Yet, despite such challenges, most veterinary nurses in veterinary oncology research are enthusiastic about their job, and encourage interested colleagues to consider becoming involved. “When I made the transition to the research side of things, I was able to develop a whole new perspective,” Carroll says. “I thought I knew a lot about oncology before, but this is a whole new world. I like being challenged, and this is one more way of doing that as we are constantly finishing and opening new trials, and they are all different.”

Winter agrees, noting, “Veterinary oncology research provides an awesome opportunity to grow, not only as a [veterinary] nurse or technician, but as a person. You see cancer treatments you have been working on to go to market, and help patients. It’s inspirational for me, and see cancer treatments you have been working on go to a [veterinary] nurse or technician, but as a person. You

NOCITA®
(bupivacaine liposome injectable suspension)
13.3 mg/mL

For local infiltration injection in dogs only
For use as a peripheral nerve block in cats only
Local anesthetic
Single use vial

Caution:
Federal [USA] law restricts this drug to use by or on the order of a licensed veterinarian.

Before using this product, please consult the Product Insert, a summary of which follows:

DOG Indication:
For single-dose infiltration into the surgical site to provide local postoperative analgesia for cranial cruciate ligament surgery in dogs.

CAT Indication:
For use as a peripheral nerve block to provide regional postoperative analgesia following onychectomy in cats.

DOG Dosage and Administration:
NOCITA is for single dose administration only. A dose of 5.3 mg/kg (0.4 mL/kg) is administered by infiltration injection into the tissue layers at the time of incisional closure for dogs. A single dose administered during surgical closure may provide up to 72 hours of pain control.

CAT Dosage and Administration:
NOCITA is for administration only prior to surgery. Administer 5.3 mg/kg per forelimb (0.4 mL/kg per forelimb, for a total dose of 10.6 mg/kg/cat) as a 4-point nerve block prior to onychectomy. Administration prior to surgery may provide up to 72 hours of pain control.

Contraindications:
Do not administer by intravenous or intra-arterial injection. If accidental intravascular administration occurs, monitor for cardiovascular (dysrhythmias, hypotension, hypertension) and neurologic (tremors, ataxia, seizures) adverse reactions. Do not use for intra-arterial injection. In humans, local anesthetics administered into a joint may cause chondrolysis.

Warnings:
Not for use in humans. Keep out of reach of children. NOCITA is an amide local anesthetic. In case of accidental injection or accidental topical exposure, contact a physician and seek medical attention immediately. Wear gloves when handling vials to prevent accidental topical exposure.

Precautions:
Do not administer concurrently with bupivacaine HCl, lidocaine or other amide local anesthetics. A safe interval from time of bupivacaine HCl, lidocaine or other amide local anesthetic administration to time of NOCITA administration has not been determined. The toxic effects of these drugs are additive and their administration should be used with caution including monitoring for neurologic and cardiovascular effects related to toxicity.

The safe use of NOCITA in dogs or cats with cardiac disease has not been evaluated.

The safe use of NOCITA in dogs or cats with hepatic or renal impairment has not been evaluated. NOCITA is metabolized by the liver and excreted by the kidneys. The ability of NOCITA to achieve effective anesthesia has not been studied. Therefore, NOCITA is not indicated for pre-incisional or pre-procedural local-regional anesthetic techniques that require deep and complete sensory block in the area of administration.

The safe use of NOCITA in dogs for surgical procedures other than cranial cruciate ligament surgery has not been evaluated.

The safe use of NOCITA in cats for surgical procedures other than onychectomy has not been evaluated.

The safe use of NOCITA has not been evaluated in dogs or cats younger than 5 months old.

The safe use of NOCITA has not been evaluated in dogs or cats that are pregnant, lactating or intended for breeding.

DOG Adverse Reactions:
Field safety was evaluated in 123 NOCITA treated dogs. The most common adverse reactions were discharge from incision (3.3%), incisional infection (2.4%), and vomiting (2.4%).

CAT Adverse Reactions:
Field safety was evaluated in 120 NOCITA treated cats. The most common adverse reactions were elevated body temperature (6.7%), surgical site infection (3.3%), and whistles they need or would like,” Carroll says. “However, I do believe that the research we are doing with what we have is still incredible and beneficial.”