

Best friends



CARING
FOR **KOOTER**
Life as a three-legged dog.

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ON THE
FOREFRONT OF
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CURIOUS COMPANIONS

With over 8.8 million pet cats in Canada, more people choose cats as animal companions compared to dogs. But research trends show cat owners are less likely to take their cat for regular veterinary care. Why is this the case and what is changing to make vet visits easier on cats and their owners?

the facts about cats

Cats are mysterious creatures and their behaviour is intricate. Researchers at the University of Guelph's Ontario Veterinary College (OVC) are studying various areas of cat behaviour, aiming to improve our feline friends' health and well-being.

Carly Moody, a PhD candidate in professor Lee Niel's Companion Animal Behaviour and Welfare Lab, is investigating new methods to improve the experience of cats during veterinary visits. Carly says stress is a major reason why cat owners are less likely to bring their cats to the veterinarian.

In recent research findings, Carly identified a number of indicators of stress and fear in cats, including having their ears back, dilated pupils and increased respiratory rate.

Cats can be unpredictable and most people find it hard to recognize the signs of fear and stress, she explains. Carly is now focusing on identifying the commonly used handling techniques that can help minimize stress in cats.

"Understanding the signs of stress coupled with proper handling techniques can help veterinary teams create a better overall experience for their cat patients," Carly says.

Some traditional and commonly used handling techniques include full body restraint, scruffing (holding the loose skin at the back of the cat's neck), applying a muzzle to the face and towel wraps. "Recent results suggest minimal restraint techniques are most effective," Carly explains.

Continues on next page.

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BACK COVER
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From the desk of our Managing Director

KIM AND HER DOG JUNO.

I consider myself very lucky to work at the Ontario Veterinary College (OVC). Almost every day, I get to meet extraordinary people, and sometimes their pets, who are inspired to do great things by the love they have for animals. Whether it's seeing how a pet benefited from veterinary care they received here at OVC or from one of our graduates; hearing the stories behind donations that have been made in honour of an animal through our pet memorial program; or learning how future companion animals will be positively impacted by the studies we fund; I am always moved by the letters and experiences that are shared with us. These stories emphasize the truly unique relationships people have with their pets and how the animals we welcome into our individual worlds impact us over a lifetime.

In this issue I hope you will appreciate reading some of these stories. Such as, that of John and Jean Waller who, through their passion for dogs, were motivated to leave a planned estate gift to OVC Pet Trust in their will; Ashley's story about her dog Kootor's fight with

cancer and life as a three-legged dog; and Dr. Kathryn Hunt's experience losing her dog Torrie and how she learned to say goodbye. All are inspiring and moving.

We have also included spotlights on new research projects which demonstrate the value of your gifts at work and how they are advancing health through discovery – keeping OVC at the forefront of veterinary medicine to help the animals we love – live longer, healthier lives.

If there is a special pet that has made an impact on your life and you would like to share your story, we would love to hear from you. Please feel free to reach out to us, send us your letters and connect with us on social media.

Thank you for your support,

Kim Robinson
Managing Director, OVC Pet Trust

ABOUT OVC PET TRUST

OVC Pet Trust, founded in 1986 at the Ontario Veterinary College (OVC), University of Guelph, is Canada's first charitable fund dedicated to the health and well-being of companion animals. The Ontario Veterinary College is a leader in veterinary healthcare, learning and discovery for the health of all species, including our own. To learn more or to make a donation visit www.pettrust.ca.

University of Guelph Charitable Registration #: 10816 1829 RR 0001



“There is a misconception that a heavier restraint is safer, but it can actually be much more dangerous. When you use harsh restraint on a cat, fear and the potential for aggressive behaviour are increased; cats will remember that experience and may be more fearful and aggressive the next time they come to the veterinarian.”

Carly hopes her research will lead to improved recommendations for feline handling techniques for veterinary teams, decreasing stress and enhancing feline welfare. “If we can ease the stress cats feel while at a veterinary hospital, perhaps cat owners will be more inclined to bring their cats to the vet more often. Regular visits will increase opportunities to develop preventive care plans and allow for earlier detection of illness or disease.”

As a cat owner, there are things you can do at home to help make veterinary visits less stressful for your cat, such as allowing your cat to get used to its carrier by leaving it in an area where it is active and placing a comfortable blanket and treats inside.



“Cats will be more likely to develop a positive association with their carrier if given the opportunity to familiarize themselves with it in a safe and calm environment,” Carly says. “Some owners may also choose a feline-friendly clinic, or opt for hospitals that offer cat-only waiting areas and cat-friendly handling techniques during examinations and procedures.”

Carly emphasizes how important it is for cat owners to try to identify and interpret their cat’s behaviour, stressing that if an owner understands their cat’s regular routine they may be able to help detect potential health and welfare issues that can develop

over time. “Cats mask their symptoms – they are very good at hiding signs of illness and pain. Improper handling during an examination, could lead to inadequate diagnosis or issues with treatment as something could potentially go unnoticed.”

Kitten socialization is also an important piece of the puzzle, which can help with decreasing stress during veterinarian visits through the kitten’s first year and into adulthood.

“From a young age dogs are always exploring new environments,” Carly says.



“Cats often lack appropriate exposure to new people, smells, or sounds during important development phases.”

There are many ways owners can help safely socialize their kitten, such as: providing them with supervised opportunities to explore different environments outside the home, including car rides and visits to veterinary clinics; exposure to new and different types of people; interacting with other pets in a safe way; and frequent gentle handling, particularly their paws, as nail trims can be especially stressful for cats since they generally don’t like their paws being touched.

“Having a pet cat is a long-term commitment. In order to provide a cat with a good and healthy life, it is important to understand how to meet both their behavioural and environmental needs,” Carly says.

“The scientific community still has much more to learn about cats. We really don’t know enough about them, which means

there is still a lot more we can discover when looking for ways to improve feline health and welfare.”

Beyond the cat nap

Whether you are about to get your first cat or making an addition to your household, these tips from experts at the Ontario Veterinary College will help you and your home be “cat-ready” in no time:

- 🐾 Cats are territorial and need their own space. Each cat should have a safe place to rest and sleep that allows them to get away from other pets, children or family members. Some cats like being up high, while others may prefer to hide underneath things such as the bed.
- 🐾 Scratching is a normal species-specific behaviour in cats. It is important to provide your pet cat with a place of its own where it can get a full stretch for scratching, such as a high vertical surface.
- 🐾 There should be one more litter box than the number of cats within a household (for example, two cats = three litter boxes). Most cats prefer large litter boxes, with litter at least 1.5 inches deep. Cats are clean animals and prefer if litter is scooped daily. Individual cats may have a preference for litter type and litter box placement within the house.
- 🐾 Provide your cat with predictable feeding schedules and place food/water in easily-accessible areas that are free of excess noise or traffic. If there are multiple cats in the household, it may help to have more than one dish for food and water around the house to prevent resource guarding, allowing all cats access at any time.
- 🐾 Cats need mental stimulation, especially when indoors. Use interactive toys, catnip and puzzle feeders to help keep your cat active throughout the day.
- 🐾 Unsupervised outdoor cats are vulnerable to infectious diseases, parasites, vehicle collisions, fights with wildlife and getting lost. If you plan to let your cat outside, consider creating enclosures (catios) and harness-walking.
- 🐾 Cats are carnivores and require a high-protein diet to maintain their health and receive the vital nutrients they require to function.
- 🐾 For additional resources visit cathealthy.ca, an initiative created by Canada’s six board-certified veterinary feline specialists.



GET INVOLVED NEW STUDY USES CITIZEN SCIENCE TO TRACK TICK MIGRATION & BEHAVIOUR IN CANADA

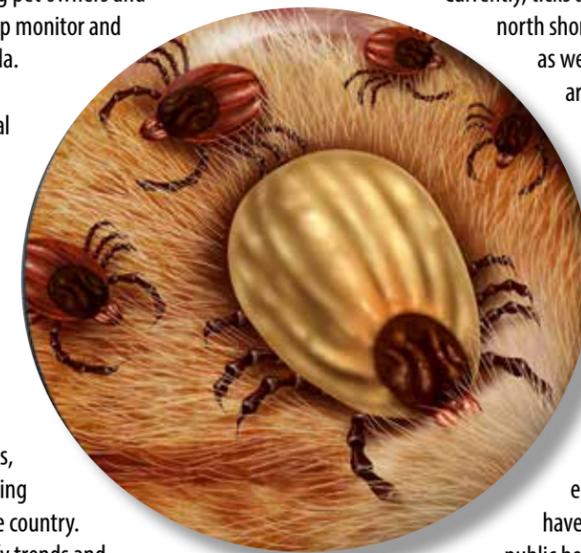
PET OWNERS HELP TRACK TICKS TO TACKLE LYME & OTHER TICK-BOURNE DISEASES

Veterinary researchers have relied on varying forms of citizen science, the collection and analysis of data relating to the natural world by members of the public, typically as part of a collaborative project with scientists, for centuries. The launch of a new online tool at the Ontario Veterinary College (OVC) is asking pet owners and primary care veterinarians to help monitor and track the spread of ticks in Canada.

Scott Weese, a veterinary internal medicine specialist and OVC Pet Trust-funded researcher, has developed a new website called *Pet Tick Tracker*. The tool serves as a portal to gather information from participants on tick sightings. Weese says the data will ultimately be used to better understand how ticks and the potential for tick-borne diseases, such as Lyme disease, are spreading across Ontario and the rest of the country. The information will help identify trends and future areas of research, which may lead to a better understanding of Lyme disease in pets and people.

The online tool has already had more than 1,700 reports filed. Pet owners and veterinarians alike can visit the website when they discover a tick on their pet. They’re asked to enter detailed information including the type of animal from which the tick was removed, the number of ticks found on the pet, the date the tick was removed and the location where the pet was likely to have picked up the tick. Individuals are also asked to identify the species of tick using an online chart with images that help decipher what type of tick was found on their pet. The black-legged tick, also known as a deer tick, is most common in Ontario. It is

the bacterium transmitted by this type of tick that causes Lyme disease in both pets and people if the tick attaches itself to the body for at least 24 hours.



“Currently, ticks and Lyme disease are common around the north shores of Lake Ontario and the St. Lawrence River, as well as a few other areas, but new ‘risk regions’ are emerging and the *Pet Tick Tracker* is helping us follow these developments as they happen,” says Weese.

“The hope is data could serve as an early warning system,” notes Weese, whose research team has already noticed signs of the Lone Star tick, a tick which experts have largely considered rare to the area, popping up in various parts of Ontario.

Weese works with field researchers who travel to hot spots to conduct surveillance once ticks have been identified. He also works closely with public health officials to monitor what’s happening in human health. “While dogs are more commonly exposed to ticks than people, they seem to be more resistant to the bacterium that causes Lyme disease than humans are,” he says. “The tracker could also serve as an alert system through human health channels.”

The aim is to increase owner education on ticks, as well as provide timely information to veterinarians in regions where ticks are starting to emerge. Weese says owners should consult with their family veterinarian on what type of preventive protection is best for their pet.

Visit www.wormsandgermsblog.com to access the *Pet Tick Tracker*.

For the LOVE of DOGS

Why one couple left an estate gift to support the future of veterinary medicine

It was an afternoon in early March 1964. John and Jean Waller's dog named Captain, a two-and-a-half-year-old, 150-pound Newfoundland breed, was in the backyard of their Ottawa home. Captain heard children yelling and making a commotion about 300 feet behind his home. He jumped the four-foot back fence and ran towards the children. A young child had fallen into a deep water-filled hole and was drowning. Captain quickly grabbed the child by the scruff of his parka and hauled him out of the water. Later that day, the child's parents gratefully knocked on the Wallers' door with tears in their eyes and treats for Captain. He was later offered a medal by the local Humane Society for saving the child's life that day.

The Newfoundland breed, commonly referred to as a "lifeguard dog", has a tendency to be a natural swimmer and is frequently credited for pulling people in distress from the water.

"I wasn't particularly surprised at the rescue," Jean was quoted as saying in an article about the rescue in *The Ottawa Citizen*. "Captain was born

with the instinct to pull people out of the water. When I myself am swimming, as soon as I put my face down, he jumps in and drags me out."

John and Jean spent the majority of their lives in the Ottawa area before retiring to Brigus, a quaint, historic town on the coast of Newfoundland, in 2000. The Wallers bred Newfoundland dogs for more than 40 years. They were referred to the Ontario Veterinary College (OVC) after one of their dogs had some heart trouble some 50 years ago.

Their friend Paul Garland remembers they both had such an admiration for the staff at OVC and their entire experience there was very positive and memorable.

"They were both true animal lovers and they both had a very similar, quirky sense of humour. They were very compatible," Paul says. "Jean always tried to find the good in every situation. If she couldn't find the good in someone or something, she had no problem telling you what was wrong — that's the type of person she was."

Jean passed away in 2005 at the age of 69 and John died at the age of 87 in 2014. "Pets were always an important part of John and Jean's lives, especially the betterment of the Newfoundland dog breed. Our pets impact our lives in many ways," Paul reflects.

It was the impact dogs made on the Wallers' lives that motivated them to leave an estate gift of \$500,000 to OVC in their will. The funds will be used to create the *John and Jean Waller Anesthesia Recovery* space, a significant part of the new \$9-million surgery and anesthesia facilities within the OVC Companion Animal Hospital. The creation of a dedicated space for recovery will ensure companion animal patients have a quiet, controlled post-operative environment to help them have a calm, smooth recovery.

"John and Jean were proud of the legacy their gift would leave at OVC and I know how much it would mean to them that their support will help companion animals across Ontario and Canada for years to come." 🐾

To learn more about leaving a legacy gift to OVC Pet Trust contact us at ovcpet@uoguelph.ca.

GIVING BACK

Pets helping other pets



Blue (front), Linda Brox's three-year-old Flat-Coated Retriever has been giving to OVC's *Blood Donor Program* for the past two years and has donated blood six times. Tide (right), age 7, and Flint (left), age 11, are both retired blood donor dogs. Tide donated blood 13 times over a three-year-period and Flint donated 24 times during his four-and-a-half year donor career.

Pets come to the Ontario Veterinary College (OVC) every day in critical condition or in need of life-saving procedures. Some, such as those that require emergency surgery, need a specific cancer treatment or suffer from a chronic illness, may require a blood transfusion.

That's exactly why OVC's *Blood Donor Program* was created in the early 1980s. To take part, owners can enroll their dogs on a volunteer basis. After applying to be a blood donor, dogs receive a complete physical exam before they join the program. Once accepted, each donor dog is able to give blood once every three months and donate approximately 450 grams of blood at each visit—about the same amount donated in human blood donor programs.

Linda Brox and her dogs have been giving back to companion animal health through the blood donor program for more than 25 years. "My dogs and I take part because I want to help people that are stuck in a difficult, scary position where their dog may need a life-saving blood transfusion," Linda says.

On top of regular blood donation visits Linda has also brought her dogs to OVC after hours in emergency situations when a patient was in immediate need of a transfusion. "I would like to think that if

the situation arose someone would do the same for my dog." Linda found herself in that very situation a few months ago. Her Flat-Coated Retriever Tigger developed gastric dilatation-volvulus, a rapidly progressive life-threatening condition where the stomach dilates and twists around itself, requiring urgent surgery. Tigger ended up benefiting from another donor dog's blood. He received a transfusion during his surgery and fortunately ended up recovering nicely.

While other veterinary blood banks exist in Canada, Linda says the added benefit of donating blood to OVC is the contribution it makes to help advance future pet health, such as Dr. Shauna Blois' Pet Trust-funded studies that examine methods to increase the safety of blood transfusions. Findings from these studies will help increase knowledge and improve best practices used in a variety of veterinary health care settings — ultimately helping to save more pets' lives.

Linda is proud her dogs have been able to help so many others that require critical care or suffer from severe illness.

"OVC takes great care of its patients. I'm honoured my dogs and I can do a small part in helping them ease pain and potentially save another dog's life." 🐾

Read more about OVC's Blood Donor Program on page 8.



BLOOD DONOR DOGS

Over a 12-month period approximately 240 units of blood are donated by dogs that are part of the Ontario Veterinary College's Blood Donor Program. "Each unit can be made into four blood products to help up to four different dog patients that are in critical need of care," says Ramona Fowler, a registered veterinary technician who has worked with the program for the past 20-plus years.

Once donated by one of the 70 dogs currently enrolled in the program, blood lasts for up to 35 days. Like humans, dogs and

cats have blood types. Blood type in pets is quite different to those in people. For dogs, there are more than a dozen different blood types, while cats have only two major blood types. Just as in human health, when an animal is in need of transfusion, proper selection of blood type is critical for patient recovery.

OVC Small Animal Internal Medicine Specialist, Dr. Shauna Blois, is leading a new study, funded by OVC Pet Trust, which examines cross-matching, a method used to test blood compatibility between the donor and the

patient prior to blood transfusion. Although life-saving for many, blood transfusions are not without risk. By ensuring blood type compatibility, the risk of transfusion reactions, such as shock and even potentially death, are greatly reduced. Blois' research hopes to determine if new veterinary point-of-care cross-matching kits, used to blood type pets on-site and within a 10-to-15-minute timeframe, are accurate when compared to laboratory methods which look

at blood under a microscope. If successful, research results will offer insight into best practices when it comes to critical cases that require blood transfusions. This may greatly benefit pets who have suffered major blood loss due to injury, such as dogs hit by a car or those that experience massive blood loss in surgery. 🐾



HOW OVC BLOOD DONOR HEROES HELP OTHER PETS

Last year there were 332 canine blood transfusions at OVC for patients in need of life-saving care.



CHRONIC ILLNESS

Certain conditions such as kidney disease may lead to blood loss or lack of red blood cell production. When a pet develops chronic kidney disease, their kidneys are unable to properly produce a hormone called erythropoietin, which helps control the production of red blood cells in the body. This condition is common in middle-aged and senior dogs.



EMERGENCY & CRITICAL CARE

Emergency situations such as a dog being hit by a car or massive blood loss in surgery may require a blood transfusion. In order to be able to perform life-saving, specialized procedures, blood is readily available in the OVC Companion Animal Hospital to replenish the blood loss in the pet's body. Ingestion of rat poison by a dog, which decreases the body's clotting ability, would require a plasma transfusion to temporarily provide clotting proteins before the body can be cleared of toxicity and start making them on their own again.



ANEMIA

Anemia is a condition that arises when the number of red blood cells falls below normal values. Patients with an autoimmune disease such as immune-mediated hemolytic anemia (IMHA), a condition where the patient's immune system destroys its own red blood cells, may require blood transfusions. All breeds of dogs and cats can develop anemia, but certain breeds may be predisposed to specific genetic conditions that may cause anemia.



CANCER

One in four dogs and one in five cats will get cancer in their lifetime. Cancer patients may require a blood transfusion in surgery for a tumour removal, anemia from leukemia or while undergoing chemotherapy. Chemotherapy drugs specifically affect cells in the bone marrow, which can put a pet at-risk for anemia or life-threatening infections.



CLINICAL RESEARCH

New point-of-care cross-matching kits to determine transfusion compatibility are being studied at OVC and may help to rapidly provide results in a clinic setting. A previous study funded by OVC Pet Trust found point-of-care blood typing kits were accurate for use in veterinary practice, allowing hospitals to perform a blood type test in just a few minutes with a few drops of blood.

Ten-year-old Fluka (photo above) was diagnosed with leukemia in October 2016. While she was undergoing chemotherapy, she received a blood transfusion from Blue (page 7 & 8).

CARING FOR KOOTER

Life as a three-legged dog.

From the salt-water seaside, to the forests and waterways of a national park in Nova Scotia, to the Blue Rodeo tour bus, nine-year-old Kooter the Golden Retriever has experienced it all.

Ashley Moffat remembers the first time she laid eyes on her eight-week-old puppy back in 2008. Her grandmother had just passed away and she had travelled back to Ontario for the funeral. She recalls the emotional moment of getting off the plane and being surrounded by sadness and grief. This is the same moment that Kooter came into her life.

"My family fell in love with him immediately. I picked him up and he fell asleep in my arms," Ashley laughs. Kooter accompanied Ashley back to her home in Nova Scotia and he grew up enjoying hiking, canoeing and experiencing the adventures the East Coast had to offer. Named after the character from the Dukes of Hazard, Kooter's big, wild and crazy personality has filled Ashley's life with excitement and positivity since the day they first met in the airport.

"I love seeing Kooter live his life – it makes my life more positive and fun to experience it with him."

In November 2016, Kooter suddenly developed a limp and a firm swelling on his carpus, which would be comparable to a human wrist. His family veterinarian,



Dr. Jody Cunningham, at Port Royal Animal Hospital in Annapolis Royal, diagnosed Kooter with osteosarcoma, a cancerous tumour in the bone, and immediately referred him to the Mona Campbell Centre for Animal Cancer at the Ontario Veterinary College (OVC). Ashley and Kooter began their drive across the country together to Ontario the next day. Ashley, her partner Greg Keelor and Kooter arrived in Guelph a few days later. Dr. Brigitte Brisson, OVC small animal surgeon, confirmed Kooter's diagnosis of osteosarcoma of the left distal radius and he was admitted on December 12. Kooter underwent left forelimb amputation surgery the following day.

Ashley and Greg appreciated receiving updates twice a day from OVC's surgical care team. "I could tell everyone at the hospital had fallen in love with him – that made a difficult time feel so reassuring. I knew my best friend was in good hands," Ashley says, smiling. Ashley and Greg were able to visit with Kooter on the evening of December 15. He was released the following day.

While Ashley had been advised that it would be hard to know how Kooter would do following the surgery (some dogs have difficulty walking and may fall down often as they adjust to life after a leg amputation), she couldn't believe her eyes when he walked out to the parking lot and jumped into the car all by himself – with only three legs.

Kooter slowly recovered in the weeks that followed with lots of love and affection, rest and music.

"Greg has a studio in his house and was in the middle of recording an album at the time," Ashley says.

After about three weeks post-op when he had been cleared to get back to normal, Ashley took Kooter out for a walk on Greg's country property. He ran almost a kilometer to the big granite boulder he regularly visited before his surgery. He jumped up on the rock with his three legs and looked out over the land. "I started crying and hugging him and we celebrated. He looked back at me as if to say thank you and that I did the right thing." Kooter quickly started to get back to his regular self – playing with his toys, going for longer walks and going on tour with Blue Rodeo.

Ashley describes Kooter as the band's unofficial therapy dog – and says he certainly gets a lot of attention backstage. On the last night of the tour in February, Greg brought Kooter and Ashley out on stage for the final song of the night, *Lost Together*.

"When Kooter – this lovable, three-legged dog hopped out on stage – the audience went wild," Ashley reminisces. "He stuck close to me, but he loved being on stage. He stared at Greg during the whole song and then was backstage immediately afterwards, looking for the room with the food," she laughs.



KOOTER & GREG AT THE MONA CAMPBELL CENTRE FOR ANIMAL CANCER.

During Kooter's post-operative chemotherapy sessions, Ashley was grateful she was able to take a short leave of absence from work so she could stay in Ontario. His last day of chemo was March 31. After his test results came back looking good, it was back to Nova Scotia for both of them. While there were adjustments to his life, Kooter quickly got back to his old routine.

"Amputation followed by chemotherapy is the mainstay of treatment for osteosarcoma of the limbs in dogs. Like Kooter, most patients with osteosarcoma adapt very well to the loss of a limb and do so quickly," says Dr. Brigitte Brisson. "Amputation removes the pain associated with the tumour and allows pets like Kooter to return to and maintain a very good quality of life as a three-legged dog."

While Ashley knows his cancer will eventually spread (bone cancer commonly metastasizes to the lungs), she is grateful for the extra time she's gained with her "best buddy".

"I'm so thankful there is a place like OVC. Our entire experience made cancer seem like not such a lonely disease; there are a lot of people facing cancer decisions with their pets. I am so happy I brought Kooter to Guelph because of the support network. I felt like we were part of the community. I hope that by sharing Kooter's story I can help at least one person out there feel a little less lonely in their own experience." 🐾



KOOTER ON-STAGE WITH ASHLEY AND BLUE RODEO.



OVC MEDICAL ONCOLOGY RESIDENT AND PHD STUDENT DR. ARATA MATSUYAMA WITH CANCER PATIENT SMOKEY.

Award-winning state-of-the-art Animal Cancer Centre celebrates five years treating pets and helping families manage the disease

It's been five years since the Mona Campbell Centre for Animal Cancer opened its doors in Guelph on September 20, 2012. Hailed as Canada's most comprehensive and state-of-the-art animal cancer treatment and research centre, it offers the most advanced tools for cancer diagnosis, treatment and teaching in the country.

"Before the cancer centre opened, the Oncology Service of the OVC Health Sciences Centre was constrained by space and facilities to what we could offer families to treat their pets with cancer," says Dr. Paul Woods, a veterinary medical oncologist at OVC. "Now five years later, the centre has allowed our team to expand and offer the most current and innovative, cutting-edge investigational therapies for companion animals."

Named for the late Mona Campbell, a longtime animal advocate and OVC supporter, the facilities were constructed with support from her estate, as well as additional funds raised by OVC Pet Trust, for a total of \$13.75 million.

The growth of the centre has been steady over the past five years. The modern facility and

staff provide their hallmark care and comfort to roughly 100 patients and their families each week. Dogs and cats are the most common patients that come through the doors, but the centre has also treated horses, rabbits, ferrets, birds and even bearded dragons.

Pet owners are referred to the centre by their family veterinarians for diagnosis or treatment, which may include surgery, chemotherapy, radiation therapy and immunotherapy. In the 2016-2017 fiscal year, the centre had more than 4,200 patient visits.

"While most of our patients are from Ontario and the United States, many patients come to us from other areas of Canada and some clients have brought their pets from as far away as Asia and Europe," says Woods.

In addition to providing care, the centre has also conducted more than 50 clinical trials since opening its doors, with each study aimed to help advance medical treatments that can improve the health or quality of life for pets. Clinical trials within the centre focus on finding answers to a wide range of cancers, including lymphoma, osteosarcoma and breast cancer.

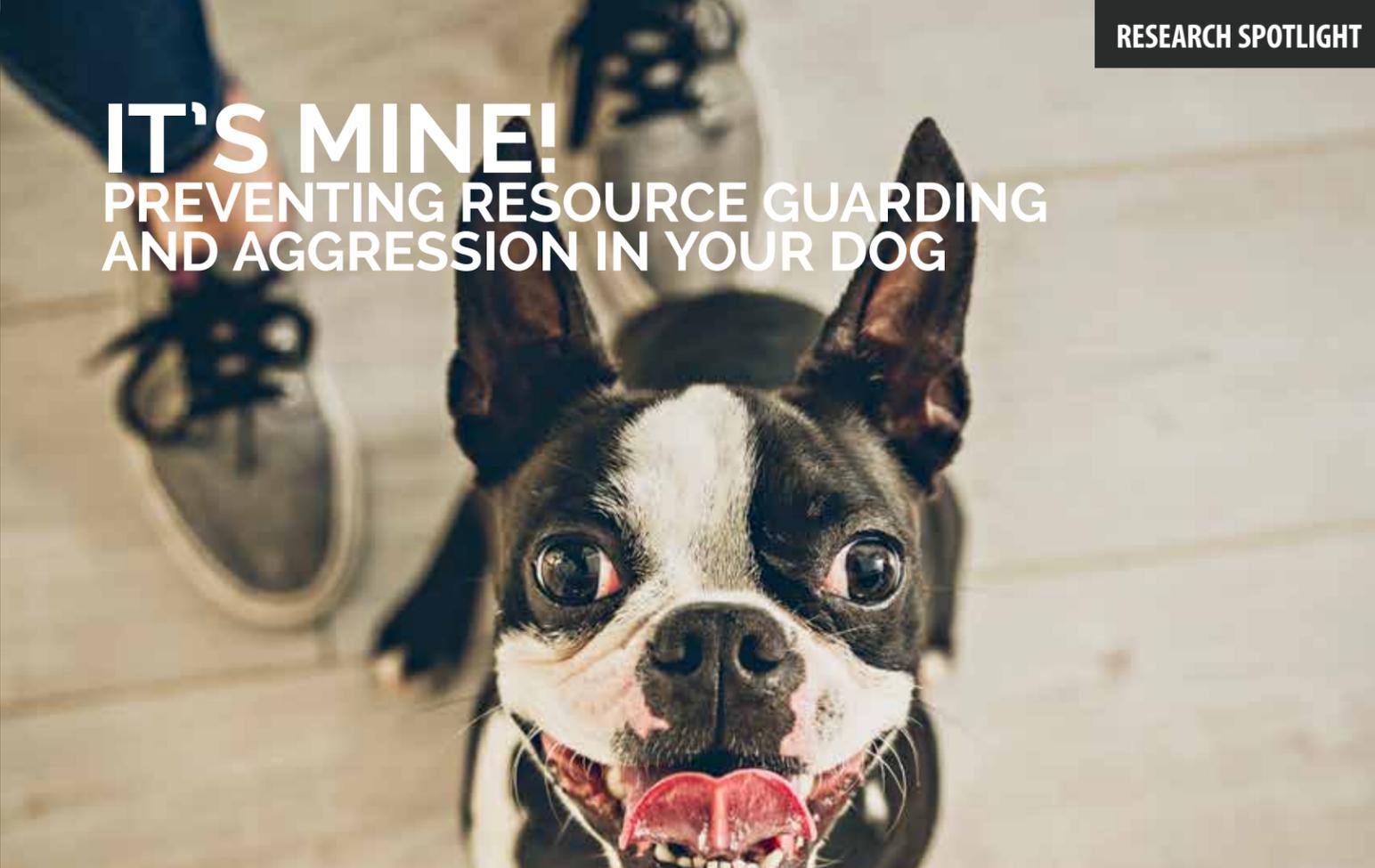
In addition to funds provided by OVC Pet Trust, cancer researchers have received support from organizations such as the Terry Fox Research Institute, Morris Animal Foundation, The Smiling Blue Skies Cancer Fund, the Canadian Breast Cancer Foundation and others to investigate naturally-occurring cancers and develop therapies that could benefit both pets and people.

The centre is also home to the Companion Animal Tumour Sample Bank, a unique resource that provides clinical specimens from naturally-occurring cancers to the scientific research community. There are currently more than 18,000 samples banked from over 1,000 patients.

Not only is the work of the centre maximizing the quality of life for animals living with cancer, it also provides world-class training for student veterinarians and post graduate veterinary cancer specialists, who travel from around the globe to train at OVC.

This past July, the cancer centre received the 2017 Practice of the Year Award from the Canadian Veterinary Medical Association. 🐾

IT'S MINE! PREVENTING RESOURCE GUARDING AND AGGRESSION IN YOUR DOG



Aggression in dogs is a serious problem for people and their pets. Recent statistics from the United States suggest that 1.8 per cent of the population are bitten by dogs each year, which would equate to approximately 600,000 dog bites in Canada. Dog aggression can result in severe safety concerns and financial costs to owners. It can also have serious effects on the welfare of dogs as aggression can lead to a breakdown of the bond between pets and owners, sometimes resulting in neglect and abuse, or leading to abandonment or euthanasia.

That's why companion animal researchers at the Ontario Veterinary College (OVC) are studying resource guarding, one of the most common types of aggression in dogs. Resource guarding is a normal behaviour in dogs and used to achieve or maintain access to valuable items, such as food or toys. Specifically, researchers are examining the ability of pet owners to identify resource guarding behaviour and the environmental, owner-related and dog-related factors that might influence whether resource guarding behaviour develops.

"While behaviourally normal, resource guarding can have serious impacts on pets and people so we're trying to develop methods for early identification and treatment of at-risk animals," says OVC's Professor Lee Niel, who is the Col. K.L. Campbell Chair in Companion Animal Welfare.

New research conducted by PhD graduate Jacquelyn Jacobs in Niel's lab identified three strategies used by dogs to maintain control of resources: rapid ingestion (quick consumption of food or treats); avoidance (blocking access to an item through body position or location change); and aggression (growling, baring teeth, snapping or biting). All of these behaviours can be observed from a dog's body language. Jacobs' study also found that owners are relatively good at identifying biting behaviour, but less likely to properly identify threats or non-aggressive forms of resource guarding.

"Proper identification of threatening behaviour is necessary to diffuse aggression to avoid bites. Rapid ingestion and avoidance are also important to consider, since there is the possibility that they

may be precursors to aggression," says Niel. "It is also important for pet owners to understand that resource guarding can affect any size or breed of dog."

Factors that might influence the development of resource guarding are also being assessed. Early results indicate that dogs that are more fearful or impulsive are more likely to show resource guarding aggression and early training for prevention may benefit these dogs. Other findings suggest this training should be focused on increased control around resources as well as making sure that interactions around the food bowl are positive for the dog.

Owner education is key. "The first step in reducing the risk of problems is by being familiar with dog behaviour and using appropriate methods for socializing, training and interacting with our canine companions." Niel also recommends that owners should seek professional advice as soon as possible if they observe their dog behaving in a way that is concerning. "Behaviour problems are easier to treat if they are caught early." 🐾

Senior PETS

Whether a lifelong friend, foster pet or new addition to your household, senior pets bring a unique bond and sense of companionship into our lives.

The relationship owners share with a senior pet is special and sometimes difficult to articulate. Veterinarians play an important role in helping guide pet owners as their pet ages. OVC experts explain how you can help your pet remain happy and healthy into their senior years.

What is 'senior' when it comes to pets? The term senior is commonly used in the veterinary community to describe an older pet.

Veterinary practitioners generally refer to cats and dogs as senior when they are in the last 25 per cent of their life span for their species and breed. This is usually considered to be around the age of seven although large breed dogs tend to have a shorter life and are usually considered geriatric at the age of six.

Owners tend to want to think of their pet's age in human years. According to the American Veterinary Medical Association (AVMA), a seven-year-old cat would be equivalent to 45 years old in humans. However, a seven-year-old dog could range between the ages of 44 to 56 in human years, depending on the breed type and size of the canine.

Providing care for senior pets.

Senior pets can develop many of the same primary healthcare problems as aging adults, including cancer, kidney disease, diabetes, heart disease, arthritis, dental disease and hyperthyroidism, to name a few.

"One of the most important pet care considerations owners should be aware of is that senior pets generally require increased veterinary care," says Dr. Shannon Gowland, OVC '95 graduate and staff veterinarian at the Hill's Pet Nutrition Primary Healthcare Centre at the University of Guelph.

While younger pets tend to go to the veterinarian once per year for their annual wellness exam, Gowland says this is appropriate because they don't tend to change as much over the course of the year. For older pets, changes can happen much more quickly and they benefit from more frequent examinations to catch issues as they arise.

"Ideally, senior pets should see a veterinarian every six months," she adds.

Keeping pets as happy and healthy for as long as possible is the common shared goal of veterinarians and pet owners alike. Veterinarians can help guide pet owners through the

aging process of their pet, including recommending treatments for common conditions.

"Aging should not be accepted as a loss of quality of life," Gowland says. While pets feel pain the same way humans do, they don't necessarily show it in the same way. Gowland encourages owners to bring their pet to the veterinarian if they notice changes in appetite, drinking or urination as these indicators could potentially signal a variety of different issues. While some people may accept that older pets will be slower-moving, there is usually something the veterinarian may be able to do about it.

"Quite often, aging issues can be delayed or we can help the pet through it," Gowland says. "For example, a dog with arthritis doesn't need to stop playing – maybe they'll need medication, modified exercise or weight loss, but vets can do a lot of things to help improve their quality of life. Come in early if you have a concern. If you're concerned, we're concerned."

Communicating with your veterinarian when it comes to older pets. Researchers at the Ontario Veterinary College are studying communication as an art of veterinary medicine.

"As your pet ages, being aware of how their veterinary care may increase or change is important," says Dr. Jason Coe, an Associate Professor and faculty lead for OVC's Medical Communication Program. Coe spends his time researching how to improve the relationship between companion animals and people and the role of communication on the outcomes of veterinary care.

Coe says owners may choose to have a conversation with their veterinarian and ask what they should anticipate over the course of their pet's life. "The relationship between a pet owner and their veterinarian is truly a partnership – from my perspective, both parties have some degree of responsibility when it comes to providing the best health, well-being and welfare for the pet."

Coe adds that the more veterinarians and owners can have these conversations before a health issue happens, the more prepared people are for them – financially, emotionally and cognitively. "If your pet's aging is important to you, it is beneficial to create a conversation early on with your veterinary care team. They're best equipped to help." 🐾

Researchers embark on Canadian lifetime study in dogs

Drs. Scott Weese and Michelle Evason have launched a landmark lifetime study investigating how disease occurs in dogs as they age.

"The goal of this long-term, multi-year study is to gain insight from data that may help us to better manage Lyme disease," says Weese, a veterinarian and infectious disease specialist at OVC. "If we can understand how dogs are exposed to the disease and the methods of determining appropriate ways to manage exposure and disease, we may be better able to prevent it from happening in the first place or provide better patient care when disease develops."

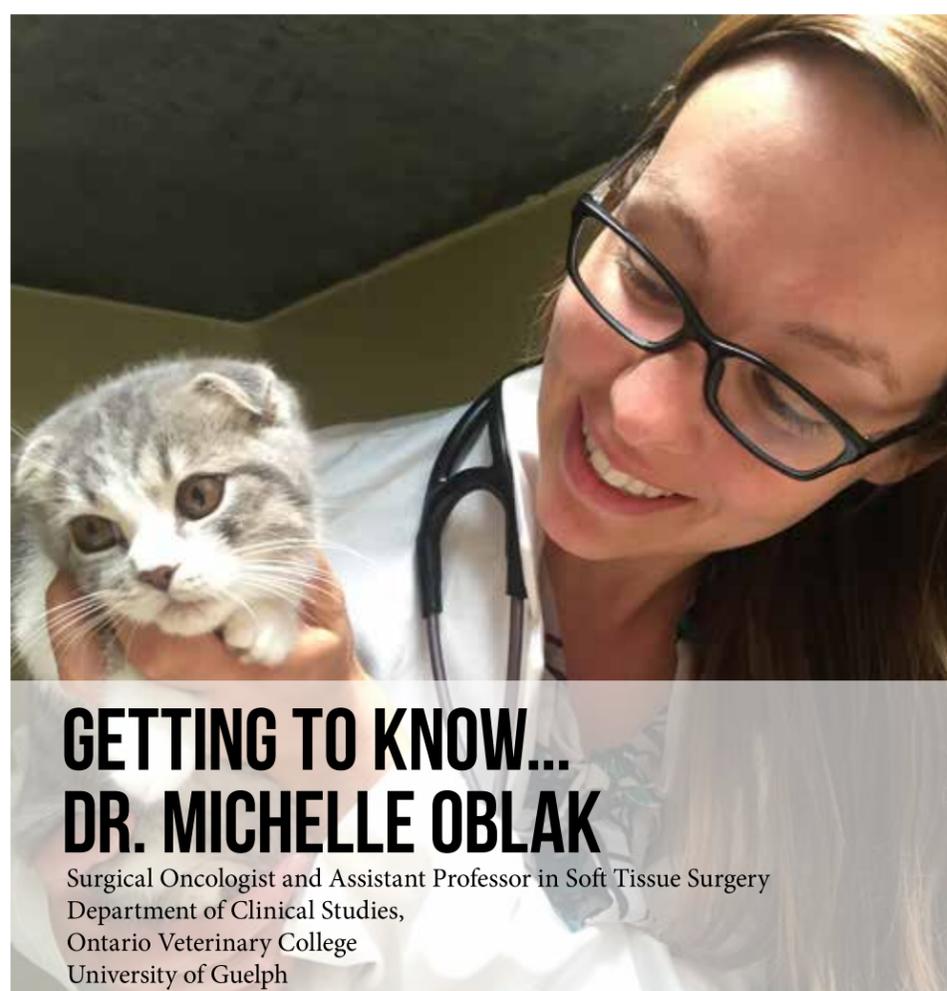
Weese and Evason hope to recruit 300 dogs from across Canada to take part in the 10-year study to identify and increase our understanding of the risk factors associated with disease. This includes examining age at diagnosis, clinical signs and response to treatment over time. The study will also explore other areas of pet health and welfare, monitoring this group of dogs and their families for years.

"There has been very little published longitudinal or long-term work in veterinary medicine, leaving many questions about things that happen to pets as they age," says Weese. "In human health, we know there are various changes that occur with aging and certain precautions we should take as we get older. While the objective of this study is to answer questions related to Lyme disease, a number of other health areas could be addressed with the data collected, such as nutrition, obesity, vaccination and deworming, and various aspects of the relationship between people and their pets."

OVC Pet Trust and IDEXX Laboratories, Inc. have been instrumental in helping to launch the project by providing startup research funds for the study and assistance with diagnostics. The team hopes data collected will help guide important decisions about Lyme disease in dogs, such as who to treat, how to treat, how to reduce exposure and what the clinical consequences of exposure will be.

The focus of this study is on dogs and discovering the long-term impact of Lyme disease in pets. However, since the disease affects both pets and people, Weese says results could help unlock answers to understanding areas of Lyme disease that also relate to human health. 🐾

Interested in participating in the lifetime study? If you have a six-month old puppy (or younger), you may be eligible. Contact your family veterinarian for more information or contact us at ovcpet@uoguelph.ca.



GETTING TO KNOW... DR. MICHELLE OBLAK

Surgical Oncologist and Assistant Professor in Soft Tissue Surgery
Department of Clinical Studies,
Ontario Veterinary College
University of Guelph

What drew you to the field of veterinary medicine?

From an early age, it was my dream to become a veterinarian. When I was 10 years old I started volunteering at a veterinary hospital, but it was later on during my time in veterinary school at OVC that I developed my interest in surgery. Surgery gives me the opportunity to make a difference in the life of a pet in a short amount of time. Whether it is improving a pet's quality or quantity of life, or both, having the specialized skills as a surgeon to have a positive effect on a pet's life is impactful for me. One of the best parts about working in academia is that my brain is constantly encouraged to look for new, different and better ways to help our patients. Innovation and progress is what inspires me in this field each and every day.

What projects are you currently working on?

One of my major research projects is examining techniques to identify the spread of cancer through sentinel lymph node mapping in dogs and cats. Exploring the spread of

cancer to the lymph nodes allows us to understand as much as possible about what's going on with each individual patient. The more we know, the better we can direct our therapy and make it a personalized treatment plan. As a surgeon, the more information I have about the spread of cancer in the body, the better I can decide if surgery is the best option for my patient. I'm also working with a collaborative research group examining osteosarcoma. We've hit a standstill with this disease; we haven't seen major progress in the past 10 to 20 years in terms of improving survival. I have OVC Pet Trust-funded studies examining both sentinel lymph node mapping and bisphosphonates, a bone-hardening drug, and its use for treatment in dogs with Osteosarcoma.

What translational benefits could your work potentially offer?

My ultimate goal with research is to provide valuable information to human medicine, while providing the best possible care for our pets. I am working closely with

several researchers at the University Health Network (UHN) in Toronto to consider complex diagnostic and treatment questions that affect both animals and humans. Unfortunately, since pets don't live as long as people, we often see progression of disease and changes much quicker in our animals, which means we may be able to detect a potential benefit in a new treatment or technique very quickly. And since cancer is naturally-occurring in pets as it is in people, having the ability to collaborate and exchange information with the human side of medicine is certainly beneficial for the health of all species.

What will OVC's new surgery and anesthesia facilities mean to you?

I'm so excited! OVC has always strived to be at the cutting-edge of innovation. As a small animal surgeon, the new facilities will allow me to continue to provide the best care to our pets in a better working environment. We do advanced procedures in our current space and we do it well, but having this upgraded space will make our days easier. One thing I've always admired about my colleagues here at the college is that we've been able to make it work with what we have and we haven't let that hold us back from innovation and pushing the boundaries. The creation of our new \$9-million facilities, made possible by our incredible OVC Pet Trust donors, will make such a huge difference, and allow us to remain at the leading-edge of innovation.

Tell us something about yourself that might surprise your colleagues.

I absolutely love to travel. I was recently in Chile and was able to dedicate part of my trip to volunteering with *Veterinarians International*. Whenever possible, I try to incorporate volunteer work when I'm travelling—it's a great way to give back.

Do you own any pets yourself?

Three cats: Finn, Jackson and Tiggs. 🐾



Life on OVC's Cardiology Service



OVC's Cardiology Service at the OVC Health Sciences Centre does much more than provide advanced cardiac diagnostics and therapy to pets that are referred from their family veterinarian. It is one of many services at OVC that offers specialized training for interns, residents and Doctor of Veterinary Science (DVSc) students.

DVSc is a post-professional degree dedicated to advanced clinical education and research.

Dr. Shari Raheb's Cardiology DVSc position is one of several specialist-in-training roles funded by OVC Pet Trust.

Welcome to the Cardiology Service at the OVC Health Sciences Centre, where companion animals are referred by their primary care veterinarian for advanced, specialized cardiac diagnostics and therapy. From a screening program to explore a common heart disease in Doberman Pinschers, to being one of the few centres in Canada that offers minimally-invasive interventional techniques to patients in need of life-saving surgical cardiac care, the cardiology team at the Ontario Veterinary College (OVC) is tackling pets' most urgent heart health issues.

Dr. Shari Raheb graduated from the Doctor of Veterinary Medicine (DVM) program at the University of Prince Edward Island in 2013 and is currently in the third year of a four-year Cardiology DVSc program at OVC. She spends the majority of her time on clinics seeing patients, like she is doing today. Shari's role is one of several specialist training positions funded by OVC Pet Trust. "I am beyond grateful for funding from Pet Trust. It has allowed me to pursue this residency and follow my dream of becoming a veterinary cardiologist and help pets."

In addition to clinical activities, Shari also devotes part of her time pursuing research examining why and how dilated cardiomyopathy (DCM) develops by analyzing the changes in heart function as dogs prog-

ress from first being diagnosed with the disease to eventually succumbing to the symptoms. DCM is commonly referred to as "weak heart" and occurs when the enlarged and weakened heart muscle becomes unable to pump blood around the body, eventually leading to congestive heart failure or sudden cardiac death. Dobermans are prone to inherited DCM.

In her current study with OVC board-certified veterinary cardiologist Dr. Lynne O'Sullivan, Shari is following 20 dogs who have been diagnosed with pre-clinical DCM. "From the time a dog is diagnosed with DCM, that dog may have months or years to live. The big question we are investigating is why some dogs progress faster than others and if we can come up with ways to predict which dogs will progress more quickly or slowly in order to help us delay heart failure or sudden death," Shari explains. Her team is specifically studying a hormone called brain natriuretic peptide (BNP) and advanced ultrasound parameters to examine if changes over time may predict a patient's outcome or response to therapy.

Our writer went behind-the-scenes with Cardiology resident and specialist-in-training Dr. Shari Raheb for a glimpse into the intricate world of companion animal cardiovascular medicine.

Continues on next page. 17



CASE: Gracie, one-year-old Doberman

TUESDAY 9:02AM

Gracie is the first appointment of the day. "Our last dog before we got Gracie was a Doberman and she dropped dead suddenly at the age of five," the owners share. "We're eager to rule out that Gracie doesn't have a similar heart condition."

Gracie's family veterinarian referred her to OVC after being unable to confirm an enlarged heart image from an ultrasound performed in their hospital prior to the dog being spayed. Shari reassures Gracie's owners and says she won't be jumping to any conclusions before she conducts a full exam. Gracie is escorted to the Cardiology Service and is hooked up to advanced monitoring equipment. The team uses sophisticated state-of-the-art, comprehensive cardiovascular diagnostic services to examine and assess patients like Gracie including echocardiography, also known as a cardiac ultrasound or simply 'echo', and electrocardiography (ECG). An ECG measures the electrical activity of the heart, whereas an echo is used to look at the heart's structure and check how well it functions. An echo shows the cardiology team the size and shape of the heart, the thickness and movement of the heart's walls, how well the heart pumps and fills, if the valves are working correctly or if there are any abnormal masses.

9:20AM

Shari begins an echo with the help of registered veterinary technician (RVT) Deb Kingston. She maneuvers a probe over the dog's chest to show different views of the heart on her screen – the probe produces sound waves that

bounce off the heart and "echo" back to the probe, creating live pictures on the video monitor for Shari to analyze. For the next 45 minutes, she examines the various structures, looking for any thickening, abnormalities or valve problems. A colour-scheme of red, blue and green allows her to examine blood moving through the heart in real time – she analyzes both direction and speed, and consults with Dr. Sonja Fonfara, OVC faculty member and board-certified cardiologist, on her findings.

10:55AM

Shari delivers Gracie back to her owners with the good news – her heart looks completely normal.

"That's not to say Gracie may not one day develop DCM. Unfortunately, we don't have techniques to prevent it but we do have good ways to help. As an academic institution, we have the benefit of investigating the disease through our research screening program," Shari explains.

Her owners plan to enroll Gracie in OVC's *Doberman DCM Screening Program* when she turns two, and give Shari a grateful hug. "You have made our year!"



CASE: Zuzia, one-year-old mixed breed (Yorkshire Terrier-Pomeranian)

1:30PM

A one-year-old mixed breed Yorkshire Terrier-Pomeranian named Zuzia is admitted for a balloon valvuloplasty surgical procedure. Zuzia was previously diagnosed with pulmonic stenosis, a congenital condition common in small breed dogs that involves narrowing of

HEART HEALTH AT GUELPH

The University of Guelph's (U of G) Centre for Cardiovascular Investigations (CCVI), led by Professor Tami Martino in OVC's Department of Biomedical Sciences, combines expertise in cardiovascular biology and clinical medicine. It provides a comprehensive, multi-disciplinary environment to support and enhance basic, translational and clinical cardiovascular studies.

The CCVI brings together researchers in the Ontario Veterinary College and the College of Biological Science. By working at the molecular and clinical levels at the University and beyond, they ensure that every aspect of cardiovascular health is covered. With more than 100 cardiovascular scientists, clinicians and students from the University of Guelph and across the country, the CCVI is enhancing heart health on local and global scales.

CCVI faculty and students have received more than \$50 million in external research funding as well as numerous awards and partnerships. They have been awarded more than \$12 million in the last five years alone. Research funding to CCVI investigators is awarded through grants from the Canadian Institutes of Health Research, Heart and Stroke Foundation of Canada, Natural Sciences and Engineering Research Council, OVC Pet Trust, Canada Foundation for Innovation, Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) and private donors.

Reflecting the U of G's strategic research direction to promote health and well-being, the CCVI works to identify treatments for both humans and animals. A number of professors at OVC are conducting veterinary clinical research to advance this effort. Dr. Lynne O'Sullivan uses echocardiography for early diagnosis of cardiomyopathy in dogs, especially Dobermans. She works with centre members to develop biomarker tests to better diagnose and treat animals with this fatal disease. Dr. Sonja Fonfara is examining heart muscle changes in cats with cardiac disease, which could help in understanding how the disease progresses in humans. And, Dr. Peter Physick-Sheard studies atrial fibrillation, a common and deadly disease involving irregular heart rhythm in performance horses and people. These clinical studies not only lead to better heart health management for animals, but they will also benefit human patients with cardiovascular disease.

Adapted from U of G Office of Research Magazine, 2017.



A CARDIAC ULTRASOUND, ALSO KNOWN AS AN ECHO, IS USED TO EXAMINE THE STRUCTURE OF THE HEART AND INSPECT HOW WELL IT FUNCTIONS.

2:24PM

Shari is happy with the outcome of the procedure today, and the team is one step closer to making Zuzia as healthy as possible and able to live a normal life. By 2:30, Shari calls Zuzia's owner to let him know the procedure went well, as the dog wakes up in anesthesia and is transferred over to her room for the night in ICU. Shari, along with the faculty cardiologist, are on call in the evenings for after hours emergency cardiac cases, or if any of their patients in ICU have any issues.

3:30PM

"We see a variety of both young and old patients on our service. In young patients, the disease is typically congenital, like Zuzia. In older patients, usually it's an acquired disease," Shari explains as she completes paperwork and prepares for a new hospital admission. Shari originally became interested in cardiology after a rotation in her fourth year of the DVM program. One case allowed her to experience implanting a pacemaker into a dog and she fell in love with the field. About 80 per cent of the service's patients are dogs and 20 per cent are cats.

THURSDAY 8:45AM

Zuzia's post-operative echo shows her heart valve looking more mobile and the speed of blood flow across the stenosis is lowered. The team is pleased with the result. Zuzia will be discharged this morning, and sent home with antibiotics to protect against infection. Shari wants to see her back in three months for a recheck. "The heart can show positive remodelling over time – we will likely continue to see more improvements as time goes on."

After a busy few days, Shari is buried in paperwork for several patients, including scheduling a new patient for an upcoming balloon valvuloplasty procedure and updating several patient files before contacting their family veterinarians who referred them to the Cardiology service to let them know the outcome of their appointments. While it's clear Shari's days are jam-packed with patients, analyzing and learning, she

WEDNESDAY



SHARI SCRUBS INTO ZUZIA'S SURGERY.

11:30AM

After seeing a new patient first thing in the morning, Shari and Sonja scrub into surgery as Zuzia is wheeled into the operating room by the anesthesia team. The minimally invasive procedure is done under general anesthesia through a small incision into the dog's

jugular vein. After shaving and surgically preparing the fur around her neck, Shari passes a catheter down through to her heart, an extremely delicate maneuver that is done with Sonja's guidance. A balloon catheter inserted across the valve is inflated, opening up the valve. The procedure takes almost two hours from start to finish. Zuzia will be monitored all night in the ICU. If

Zuzia's condition had been left untreated, it would have led to heart failure.



SHARI WITH DR. SONJA FONFARA IN SURGERY.



ZUZIA IS PREPARED FOR HER PROCEDURE IN THE OPERATING ROOM.



ZUZIA WAITS FOR HER POST-OPERATIVE ECHO BEFORE SHE IS DISCHARGED.

thrives on helping pets and their people. "I'm beyond grateful to have the opportunity to be trained at a world-class veterinary school," Shari says. "Having the opportunity to impact the lives of pets in a positive way is the best job in the world." 🐾

FROM LEFT TO RIGHT: DR. MICHELLE OBLAK, DR. ALEX ZUR LINDEN, JOHN PHILLIPS AND DR. FIONA JAMES.



ON THE FOREFRONT OF VETERINARY MEDICINE

Developing treatments, care plans and new diagnostic techniques through the use of 3-D print

From the clinic to the classroom, 3-D printing is changing the future of veterinary medicine. A collaborative network of staff and researchers at the University of Guelph (U of G) are studying the feasibility of 3-D printing and rapid prototyping of patient-specific implants for dogs, and 3-D printed models for surgical planning.

This group includes the Ontario Veterinary College's (OVC) veterinary radiologist Dr. Alex zur Linden, surgical oncologist Dr. Michelle Oblak, neurologist Dr. Fiona James and design engineer John Phillips from the U of G's Digital Haptic Lab in the College of Arts.

Zur Linden started working with Phillips a few years ago, when he needed help constructing a canine urinary bladder model that would serve as an affordable learning prototype and allow student veterinarians to gain hands-on experience in a new method to biopsy the bladder using an

ultrasound-guided approach. Now three years later, Phillips and his team work with an expanded group of OVC clinicians to plan, design and print materials to help create individualized care plans for selected complex cases. This collaboration is expected to lead to improved care options and reduced risks associated with extensive surgery, such as length of time on the operating table.

"We use information collected from the patient including CT scans to develop a 3-D model," says Michelle Oblak. "John and his team build the anatomical model based on the scans, which provides a new method for us to plan the surgery, especially in the case of tumours that are in a difficult location. We can take the model apart and look at the tumour from all sides before we head into surgery."

Client communication is also improved, Oblak adds. "Being able to allow a pet

owner to hold a model not only shows our level of expertise and planning, it also helps provide a real-life visual of their animals' procedure."

From livers, to bladders to skulls, the team is producing it all and it's only just the beginning. "At the heart of it all, I'm a problem-solver," says Phillips, who has also developed educational models for both veterinary and human medicine as well as a device that will be used by NASA to explore plant growth in space.

Since 3-D printing technology has become more accessible and available in recent years, OVC researchers say there are still a number of questions that must be examined to ensure safe use in medical applications, such as an implant or artificial limb. The team is currently conducting a feasibility study, where they are reviewing past cases to assess the safety and effectiveness of customized 3-D printed

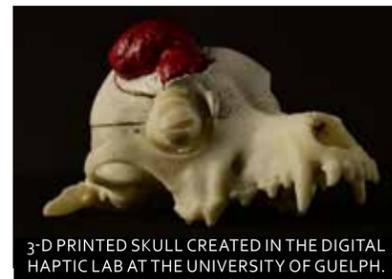
implants in a broad number of clinical scenarios to replace current treatments.

"The actual act of 3-D printing is the easy part. Anybody can print something," says zur Linden. "Like all care plans, it is the process of knowing how to identify appropriate cases, understanding which patient will be the most likely to benefit, ensuring patient safety and having the right team in place to carry out the plan – that's the challenging part."

Zur Linden is currently examining the sterility of a variety of materials that could be used to create 3-D implants, specifically in the case of skull tumour removal, based on the smoothness and roughness of the materials. Researchers say there is currently no published literature on bacterial biofilm growth on 3-D printed implants. The project aims to culture 3-D printed materials in the laboratory and evaluate bacteria growth adhering to different

implants, which could have an implication on the development of infection in the body postoperatively.

There are limited reported cases of a 3-D printed metal implant in human medicine. "We have the potential to provide a lot of insight," zur Linden says.



3-D PRINTED SKULL CREATED IN THE DIGITAL HAPTIC LAB AT THE UNIVERSITY OF GUELPH.

From a teaching perspective, 3-D printing allows OVC to create useful, realistic models to improve students' psychomotor skills. "Giving students the opportunity to repeatedly practice a skill and receive timely feedback using models helps us increase their confidence and individualize

the educational experience. It is much more interactive than a textbook," says zur Linden.

The consensus remains that 3-D printed implants will undoubtedly have a positive impact on the future of veterinary medicine.

"Ideally, it will mean faster, safer and better surgeries for our pets," says neurologist Dr. Fiona James, adding that there are applications for everywhere in the body. While the topic is still very new, the team hopes their research will answer the many questions about how the technology may best help their patients and help move towards a customized treatment.

"We have the potential to help in the areas of reconstructive medicine, cancer surgery and joint replacement. The possibilities really are limitless." 🐾

YOUR GIFTS AT WORK

Investing in Discovery

OVC Pet Trust invests in new projects to advance care options, health and well-being for pets

Each year, OVC Pet Trust invests nearly \$500,000 into projects and equipment to benefit companion animal health and well-being.



DOG HEALTH

Does the blood thinner drug clopidogrel work against platelets in sick dogs?

Dr. Anthony Abrams-Ogg
Health Area: Various

Using special blood tests, this study will help document if some dogs do not get enough of a blood-thinning effect from the drug clopidogrel, thereby identifying cases which remain at increased risk for stroke-like events and require additional blood-thinner treatment. This study may also help determine if there is a degree of blood-thinner effect using these blood tests that will prevent stroke-like events and enhance survival with different diseases.

Does lymph node cancer affect a common test for kidney disease in dogs?

Dr. Anthony Abrams-Ogg
Health Area: Cancer

A new test to assess kidney function involves measuring symmetrical dimethylarginine (SDMA), a normal waste product in the body that is excreted by the kidneys into urine. However, some dogs with lymphoma appear to have increased levels of SDMA with no other evidence of kidney disease. This study aims

expected it will be extremely clinically useful for veterinarians to decide when to investigate and treat patients more aggressively for gastrointestinal hemorrhage. Findings may also help to detect GI bleeding before the patient has clinical signs.

Using stem cells to enhance recovery after canine spinal cord injury

Dr. Luis Gaitero

Health Area: Neurology
Improve outcome rates and the predictability of recovery after surgery in dogs suffering severe spinal cord injury such as intervertebral disc herniation.

A new diagnostic method for inflammatory brain and spinal cord diseases in dogs

Dr. Stefan Keller

Health Area: Neurology
This study aims to investigate a novel diagnostic method for meningoencephalitis of unknown origin, an elusive group of neurological diseases in dogs. If successful, the study will provide the basis for a more precise and reliable diagnosis that will guide treatment and foresee outcomes.

to measure SDMA in dogs with lymphoma before and after chemotherapy to further examine the effect of their disease on their SDMA levels.

Using eye ultrasound to predict brain swelling in dogs

Dr. Shane Bateman

Health Area: Neurology
This study will evaluate a simple, practical and readily accessible diagnostic tool's ability to diagnose or predict brain swelling, a problem that is very serious and currently difficult to predict in many cases. If successful, this technique could allow rapid and early detection of brain swelling and potentially reduce the risk of life-threatening complications of many neurologic diseases.

Fecal transplant in the treatment of dogs with inflammatory bowel disease

Dr. Shauna Blois
Health Area: Inflammatory

/ immune-mediated
This will be a first prospective, controlled study examining fecal transplant for treatment of inflammatory bowel disease in dogs. This study could help identify a novel, drug-free treatment option to improve remission rates in dogs treated for this condition.

Using blood ratios to accurately and non-invasively detect gastrointestinal bleeding in dogs

Dr. Alice Defarges
Health Area: Gastrointestinal
The simple ratios to be examined are available in all routine biochemistry profiles, and it is

Do bacteria commonly found in canine surgical site infections contain genes that promote resistance to commonly used disinfectants in small animal surgery?

Dr. Ameet Singh

Health Area: Surgery
Surgical site infections (SSI) are an increasing concern in veterinary practice. The impact of SSIs can include increased morbidity and mortality, client and medical caregiver frustration and grief, prolonged patient hospitalization and increased treatment costs. This study will examine genes in bacteria that are resistant to disinfectants commonly used in human and veterinary hospitals. The results of this study may impact how patients are prepared for surgery.

Sterility testing and bacterial biofilm formation assessment on materials used in 3-D printing of patient specific implants

Dr. Alex zur Linden

Health Area: Infectious disease, cancer
This research project will help build a solid foundation for a collaborative group of researchers to explore innovative uses of customizable, rapid prototyping for the treatment of various companion animal conditions. Testing the sterility and bacterial biofilm growth on various types of material used in rapid prototyping is the key first step before safely using this cutting-edge technology to improve the health and well-being of companion animals.

DOG AND CAT HEALTH

Use of Newcastle disease virus to treat cancer in dogs and cats

Dr. Leonardo Susta

Health Area: Cancer

Newcastle disease virus (NDV) causes a severe form of respiratory disease in poultry but has a long-standing history of being very safe and effective in treating cancer in human patients. NDV is a very promising therapeutic that awaits application in veterinary oncology. OVC researchers have already demonstrated the potential of NDV to kill one canine osteosarcoma and two canine melanoma cell lines. The primary objective of this study is to generate an OVC-based oncolytic NDV strain (viruses that have the capacity to cause tumor regression) without proprietary constraints.

CAT HEALTH

Novel approach to studying intravenous fluid administration in cats to improve understanding and safety

Dr. Shane Bateman

Health Area: Various

With limited evidence to support our current fluid administration practices in veterinary medicine, particularly in cats, this research project hopes to provide fundamental tools for measuring fluid movement and effects for future studies in clinical patients. The development of simple, non-invasive tools for the assessment of fluid compartmental shifting, as well as a greater understanding of intravenous fluid behaviour in cats, would provide modern evidence to support safer and more effective fluid therapy practices in this species.

Evaluation of a sedation protocol to decrease anxiety in cats during transportation and medical examinations at the veterinarian

Dr. Andrea Sanchez

Health Area: Various

It is anticipated this study will have a significant impact on clinical practice. With an effective oral sedation protocol that is safe for use in cats, veterinarians will have a mechanism to make repetitive interactions with cats a less stressful experience for patients, owners and the veterinary team.

AVIAN EXOTIC HEALTH

Reference values for blood cells of tarantulas

Dr. Hugues Beaufre

Health Area: Various
Tarantulas are commonly kept by hobbyists and as pets but there is still limited information on diagnostic tests in the arachnid species. This project aims at characterizing the morphology and concentration of hemocytes (tarantula blood cells) in the hemolymph (tarantula blood) of the Cameroon red baboon tarantula. This will help assess overall health and blood response to disease of sick tarantulas.



DR. HEATHER STEWART WITH SIMON, GUILDCREST'S HOUSE CAT.



Guildcrest Cat Hospital gives back

Dr. Heather Stewart and her team have one thing in common: they're all passionate about caring for cats. When you enter the front doors of Guildcrest Cat Hospital in Scarborough, there is no shortage of cat details. From cat toys and climbing trees scattered throughout the space, to art and décor sprinkled around the facilities, it's clear you're in a comfortable, feline-friendly zone.

"Cats are extremely stoic, secretive creatures," says Dr. Stewart, owner and founder of Guildcrest. "When a cat is ill, they can be masters at masking their symptoms. Whereas dogs can sometimes give the veterinarian hints at what might be wrong, we rely heavily on history from the owner as well as diagnostic tests to help us identify illness and disease in cats."

Stewart opened Guildcrest Cat Hospital in 1988 as a feline-only practice to offer cats individualized veterinary care including preventive medicine, surgery, dentistry, boarding and grooming.

"I often describe feline medicine as part art, part science and part detective work," she says.

The Guildcrest team gives back to help advance animal health through OVC Pet Trust's Pet Memorial Program by donating

in memory of their cat patients who have passed away.

"One of the best parts about giving to Pet Trust, is that we often hear our clients then turn around and make a donation themselves, increasing the awareness about the important work Pet Trust funds at the Ontario Veterinary College (OVC)," says Dr. Stewart, who completed an internship in small animal medicine and surgery at OVC following the Doctor of Veterinary Medicine program at the Université de Montreal.

Guildcrest also gives back to local cats in need of finding homes. *Buddy's Buddies Adoption Program* was founded more than 10 years ago in memory of Guildcrest's late clinic cat named Buddy. Buddy himself was a stray cat and found love from the Guildcrest team and clients, and ended up living at the hospital until the age of 22. The team provides veterinary care and helps find forever homes for the program's stray or relinquished cats, which involves medical examinations, vaccinations and a thorough screening process to match cats with the best home.

"As Leonardo Da Vinci once said, 'the smallest feline is a masterpiece' – our team takes that quote to heart," Dr. Stewart says, smiling. 🐾



S A Y I N G G O O D B Y E

Torrie's Rose

By Dr. Kathryn Hunt, DVM, OVC 1981

DR. KATHRYN HUNT AND TORRIE.

The story begins almost 15 years ago, when two tiny Jack Russell Terrier puppies came home to my family. Born in a Mennonite barn, Torrie and Hailey were two girls in a litter of four pups. Guided by our hearts, not our minds, my daughter and I picked one puppy but somehow came home with two.

Torrie had a curious habit: she loved to smell flowers. I called her my flower-sniffing dog. With her black nose almost touching, she breathed in with obvious delight. She tilted her head, turned her face and carefully sniffed every flower. Countless times I watched her smell flowers as she wandered through her garden of scents and sunshine and grass.

Cradled in the warmth of a deep armchair and surrounded by my supporters, I tearfully hugged Torrie. An intravenous infusion was given and Torrie passed away peacefully in my arms, close to my heart, my tears washing over her little head. I knew she felt my love as her spirit left this world.

they could have been blowing in a summer breeze. My mom's tasty chicken-bake sat invitingly on the earth-toned table cloth. It was delicious – the perfect comfort food. "With perfect comfort people", added Pauline. Everyone agreed and served themselves seconds while my other little terrier Hailey, still happy and healthy, slept nearby on her dog bed.

I dreaded returning home. I feared emptiness in Torrie's room. Unfilled dog bowls and a vacant bed were bleak reminders of the illness that took Torrie's life. I wanted to shut the door.

Another yellow rose had accompanied me home. Mom wrapped its stem with a damp paper towel, protected it from cold with plastic and sent a solution to nurture it. I placed the rose in Torrie's room on the desk with her photograph.

Instantly the room was transformed by light; the emptiness filled with the presence of my sweet garden dog. Sunny days when she wandered with her nose to the ground, stopping to sniff flowers or lie in warm grass in her ridiculous upside-down sprawl; how she sat in a statuesque pose, face pointing sunwards, nose in the air, eyes half closed. Strikingly still, only her nose wiggled to sample the scents of her world. At sunset, she napped contentedly, curled up in a rustic chair.

Torrie was alive in the garden of my mind. My sadness was eased by the yellow rose. Next morning, daylight streamed through the window onto the rose. Golden petals evoked images of Torrie in sunshine; its foliage a warm reminder of grasses she snuggled in. A ring of photographs now encircled the rose. Each one softened the loss. The rose and the pictures stood as comforting symbols of the beautiful part of my life that Torrie and I shared.

On a cold, bitter day I found my guide – the yellow rose. It led me and my flower-sniffing dog to a timeless meadow of memories.

Who would imagine a rose could do so much? 🐾

Celebrating Memorializing Honouring

The bond between a person and their pet is a special one. The loss of a family pet may result in a variety of emotions: denial, guilt, anger, sadness, shock, pain and other feelings. Learning how to deal with emotions is critical in order to move forward following the death of a pet. It is important to remember that people respond differently to the loss of a pet. You may not experience any of these emotions.

According to Bojena Kelmendi, grief counsellor at the Ontario Veterinary College's Health Sciences Centre, choosing to honour your pet's life is one way to help owners cope with pet loss. Placing an emphasis on the happy experiences you share can help family members experience and express their love and grief.

The following list includes ideas that people have found helpful in their journey of grieving:

- Conduct a memorial service. Plant a shrub or tree to commemorate your pet's life.
- Have a mold made of your pet's paw print as a cherished keepsake. Veterinary hospitals may provide this service.
- Keep your pet's tags, toys, collars, bedding, etc.
- Save sympathy and condolence cards and emails from family and friends.
- Create an album, scrapbook, memory box, draw or paint pictures of your pet.
- Create a journal of your pet's story: how, when and where you met,
- unique personality traits, nicknames, what you love the most and what you'll miss the most.
- Create or purchase a memory necklace with your pet's name or a memorial angel pin to wear in honour of your pet.
- Donate time, money or talent in your pet's honour to an animal charity.
- If you chose cremation, there are many options for how you can keep your pet's ashes. Your veterinarian can be a great resource for what is available in your area.

Strategies for coping with pet loss: After losing a pet some owners may find it helpful to honour their memory.

Time passed and both pups grew into dogs who loved my garden, a canine paradise

enclosed by a tall wooden fence. They wandered the yard on their routes – near garden edges, under tall plants and across my flagstone patios. Over the years they basked in the sunshine, rolled upside down in green grass and sniffed warm winds that wafted through the yard.

As Torrie and Hailey matured, their characters grew. Although they were sisters, their personas differed. Hailey was nervous and snuggly. Torrie was carefree and adventurous. Hailey was stocky and strong. Torrie was nimble and quick.

Many happy years passed. Eventually, old age took its toll on Torrie.

Torrie's bright eyes were inquisitive and young but her body had failed. A crisis was imminent. I was terrified by the choice facing me. I felt like a novice climbing Mount Everest, exposed and unprepared for cruel terrain. Even though I am a veterinarian, I flailed in the crevasse of emotion, raw and potent with dread. The painful decision I had helped others make, I could not make myself.

I reached out and wasn't alone. I found my supportive team at the Mona Campbell Centre for Animal Cancer at the Ontario Veterinary College (OVC), where Torrie had received treatment for the past eight months: medical oncologist/internist Dr. Paul Woods, grief counsellor Bojena Kelmendi and chemotherapy registered veterinary technician Geri Higginson. All offered wisdom and comfort. The excruciatingly difficult decision to give Torrie peace was made.

Along with my parents, we met in a softly lit Smiling Blue Skies Comfort Room located within OVC's cancer centre. It offered an aura of shelter, like a ledge on a harsh mountainside.

Afterwards my mom and I sat with Torrie. Mom had thoughtfully brought a yellow rose which she placed beside Torrie. It would accompany my sweet dog on the rest of her earthly journey.

I donated Torrie's remains to OVC. Knowledge is a beacon in the darkness of unknowns. Torrie's body might help light a pathway to understanding. Time was of the essence to preserve the cells. I let Torrie go, her yellow rose laying beside her.

The rose and the pictures stood as comforting symbols of the beautiful part of my life that Torrie and I shared.

That evening we had dinner at my parents' home, joined by close family friend Pauline. Two yellow roses stood elegantly at the end of the dining table. In their curved slender vases,

With special thanks to Dr. Danielle Richardson who provided expert and compassionate guidance to us through Torrie's treatment, and to all of the kind people at the Mona Campbell Centre for Animal Cancer.

Information in this article is reprinted from OVC Pet Trust's Pet Loss Support Guide. Are you in need of support? Ask your veterinarian for your FREE copy or visit: www.pettrust.ca/petlossresources

SIX DEGREES OF SEPARATION

by Suzi Beber

Suzi Beber founded The Smiling Blue Skies® Cancer Fund in 2001 after losing her Golden Retriever, Blues, to lymphoma. To honour his memory, and in gratitude for the care he received at OVC, Smiling Blue Skies has raised more than \$1.8 million to support Pet Trust's quest to find more and better ways to deal with canine cancer.

The Smiling Blue Skies Walk for Canine Cancer: Celebrating 15 Years in Calgary

I was so thrilled that I was able to travel to Calgary at the end of April to help celebrate 15 amazing years of Smiling Blue Skies Walks for Canine Cancer. Joining me on this grand adventure was Managing Director of Pet Trust, Kim Robinson.

One of the great things about Smiling Blue Skies is that it is not about one dog (or one cat) or one person, but about ALL of US, and this was so clearly felt at the Calgary Walk. What an absolutely incredible group of committed, compassionate, passionate, wonderful people!

Kim and I shared laughter and tears and wonderful stories of the human-animal bond during our time in Calgary.

A huge round of applause and humble thanks are extended to Calgary's incredible organizing team, Mary Shillabeer, Leanne Tucker, Barb Burgess and Carol Tucker, along with everyone else who helped to make this event such a resounding success.

I loved participating in the walk itself. It was such a special treat to have Leanne's "Cedar" by my side, and thanks to Ellen Kovar, we have another fabulous group of photos to carry in our hearts. Calgary's Smiling Blue Skies Walk for Canine Cancer boasts an online Facebook community of 182 members and it is growing. This makes such a difference when we fundraise for our variety of events and we want to share valuable information.

Since the spring of 2001, The Smiling Blue Skies Cancer Fund has raised more than \$1.8 million, to support Pet Trust's quest to find more and better ways to deal with the devastating disease

of cancer and the Calgary Team has truly helped to make that happen! When you add this year's \$24,000+ to their already significant \$193,184.20, you have over a whopping \$200,000 and counting!

Thank you to all the online donors, in-person donors, raffle contributors and the Courtlyn "Bump Up Your Bill" program, heroes all, helping us to take a big bite out of cancer on behalf of the precious pets and people in our lives. Currently, you are helping to fund critical, innovative cancer research at OVC, that includes eight canine cancer studies and six oncology-related studies, as well as enabling us to continue to support the Clinical Trials Coordinator position and so much more.

Everyone can see their dollars at work by checking out the Smiling Blue Skies 2016 Report at www.smilingblueskies.com.

Stay tuned for the unveiling of The Smiling Blue Skies Cancer Fund's brand new website. Long live blue skies, where hope is a kite and dreams really do come true.*



www.smilingblueskies.com

About Best Friends

Best Friends is the pet magazine of the Ontario Veterinary College. It is published two times per year by OVC Pet Trust for the interest of pet owners and for those dedicated to animal health, well-being and the human-animal bond.

About OVC Pet Trust

OVC Pet Trust, founded in 1986 at the Ontario Veterinary College (OVC), University of Guelph, is Canada's first charitable fund dedicated to the health and well-being of companion animals. OVC is a leader in veterinary health care, learning and discovery for the health of all species, including our own.

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Jane Dawkins, Managing Editor & Design
Ashleigh Martyn, Writer
Kim Robinson, Managing Director

Reproduction of material in this publication is welcomed. Comments, ideas or suggestions for future articles? Please contact the Pet Trust team at ovcpet@uoguelph.ca.

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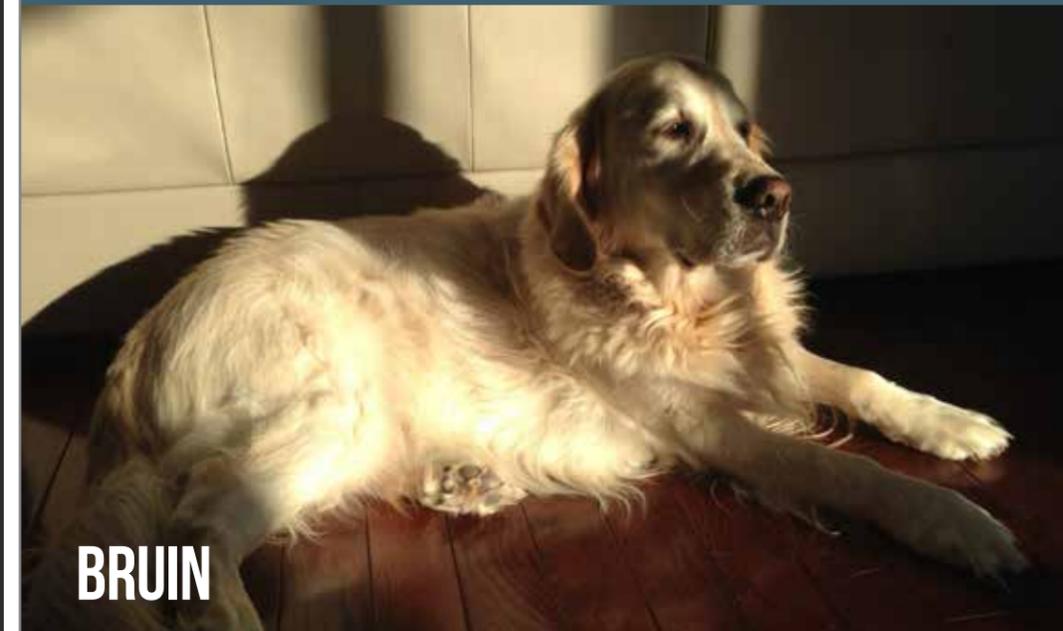
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www.pettrust.ca

IN MEMORY

"What we have once enjoyed, we can never lose. All that we love deeply becomes a part of us." – Helen Keller

OVC Pet Trust often receives heartfelt thank you letters from pet owners whose veterinarian has made a donation in their pet's memory. Best Friends' "In Memory" column was created to celebrate the lives of the pets we love. OVC Pet Trust's 'Pet Memorial Program' invites veterinary hospitals and individuals to make a donation in memory of a pet. Memorial donations help fund research and discovery at the University of Guelph's Ontario Veterinary College aimed at helping our pets live longer, healthier lives.



BRUIN

Dear OVC Pet Trust,

Thank you for your letter letting us know about the donation that Brooklin Veterinary Hospital made in memory of the passing of our loving Golden Retriever, Bruin. Your letter certainly came at a time of sorrow for our family while dealing with the loss of our Bruin, but it came at a fitting time – my birthday – to highlight the importance of discovery and advances in veterinary medicine.

Our family is deeply fond of the doctors and staff at Brooklin Veterinary Hospital. When we had to make the heartbreaking decision to end Bruin's suffering, the entire team was supportive, caring and understanding of the grief and loss we were undergoing – before, during and after saying goodbye to our boy. We are grateful for their strength and compassionate care during Bruin's passing, especially for our two children, who are nine and six, as we all went through the process together at the hospital.

Bruin was born in New Zealand in 2006 and had the litter name of 'Bear.' He had extremely big paws as

a puppy, so we decided to spin his litter name into 'Bruin.' As a family, we lived in New Zealand for several years before the opportunity arose to move back to Ontario. Bruin made the long journey with us and settled into Ontario's four seasons. He loved the snow, but having been raised in New Zealand, Bruin especially enjoyed the beach and swimming in the ocean. His love of water meant he became a cottage dog, and spent most of his summers up at our family vacation home on the lake. Like many Golden Retrievers, Bruin was a caring, empathetic family member. He was always ready for a walk, stayed by your side while reading, knew when you needed a hug and never turned down a game of tug of war.

We're thankful the gift from our veterinarian in Bruin's memory can give back to other companion animals like him. Bruin was the most brilliant Golden Retriever our family could have been blessed to have. We miss him every day.

Sincerely,
Don McNamee & Family
Toronto, Ontario

If you would like to share your "In Memory" story with us, please contact Pet Trust Writer Ashleigh Martyn via email: amarty01@uoguelph.ca.

#PETTRUSTPALS

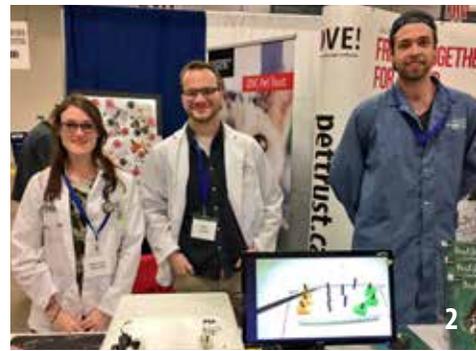
Celebrating our amazing supporters and fundraisers from across Canada! Share your event and tag your pics with #PetTrustPals on Facebook and Twitter. Connect with us and find out how your pals can GET FEATURED in Best Friends! Email: OVCPet@uoguelph.ca or visit us on [Facebook.com/OVCPet](https://www.facebook.com/OVCPet) and [Twitter: @OVCPetTrust](https://twitter.com/OVCPetTrust).



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3

PHOTO COURTESY OF JODY LOWE



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2

1. This spring a dedicated group of 34 walkers raised more than \$24,000 for the **15th Annual Smiling Blue Skies Walk for Canine Cancer** in Calgary.
2. OVC Pet Trust was at the **KW Pet Expo** this May. Families enjoyed practicing their veterinary surgical skills on a student learning model.

3. The **Second Annual Woof-Fit Tofino** in support of The Smiling Blue Skies Cancer Fund for Innovative Research was this June. Suzi Beber and her team raised \$15,458 for cancer care and discovery at OVC.
4. This past August **Ren's Pets Depot** celebrated National Dog Day by raising funds for OVC Pet Trust at their 14 stores across Ontario! \$15,000 raised!
5. This past June the University of Guelph (U of G) celebrated the first

Annual U of G Summerfest. This free, open to the public event featured live music, food trucks and showcased research and learning at U of G. The Ontario Veterinary College and OVC Pet Trust hosted a "Stuffie Wellness Check" where children were able to learn what happens when you bring your pet to the vet and the importance of wellness care. More than 4,000 people were in attendance. Stay tuned for dates for this event next year!

INDUSTRY EVENTS

OCTOBER 25: Golden Triangle Veterinary Academy Dr. Shauna Blois Lecture on Internal Medicine – Kitchener, Ontario.

NOVEMBER 3-4: Veterinary Education Today Conference & Medical Exposition – Toronto, Ontario. Booth #310.

JANUARY 25-27, 2018: OVMA Conference and Trade Show – Toronto, Ontario. Booth #107.

SHARE YOUR STORY

Do you have a story or event you would like to share with us? Would you like to learn how you can get involved and create an event to support OVC Pet Trust? Contact ovcpet@uoguelph.ca to learn more.

SAVE A TREE

Sign up to receive Best Friends electronically. Email ovcpet@uoguelph.ca to get started. This as well as past issues of Best Friends are available for download on the OVC Pet Trust website.