Best friends
THE PET MAGAZINE OF THE ONTARIO VETERINARY COLLEGE

THE emergency &
CRITICAL care

ISSUE
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From the desk of our Managing Director

I am so proud to officially announce OVC Pet Trust has reached its goal of raising 29-mil-
ion to create new advanced surgical and anesthesia facilities at the Ontario Veteri-
nary College (OVC). Construction is under-
way, and we look forward to opening our state-of-the-art facilities in 2019. Thanks to our generous donors and supporters
the new facilities will have a tremendous impact on thousands of animals referred to
OVC each year for advanced care. This facility will help keep OVC at the forefront of
veterinary medicine in raising the standard of care, offering the most advanced surgical and anesthesia techniques, diagnoses and
treatment in Canada, while training the next generation of veterinary leaders. We
look forward to sharing more about the completion of these hospital renovations in
2019. As we celebrate this success we know our work to help the pets we love is never
done. We hope you will continue to read our work to help the pets we love is never
longer, healthier lives and we can’t thank
you enough.

Kim Robinson
Managing Director, OVC Pet Trust
Ontario Veterinary College
University of Guelph

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 healthcare, learning and discovery for the health of all species, including our own. In 2018, OVC researchers published in the leading journal for veterinary research and discovery the health of all species, including our own. In 2018, OVC researchers published in the leading journal for veterinary research and discovery the health of all species.

HOW TO PROTECT BOTH YOU AND YOUR DOG FROM Echinococcus multilocularis.

• If you own a dog who eats rodents, pet owners can speak to their veterinarian about putting their dog on a preventative
monthly deworming treatment, which should minimize the risk of infection in humans. Ensuring your dog does not eat
coyote feces can protect your dog from developing the liver EM infection.

• “Increasing awareness among pet owners is important because knowledge is the first step in prevention,” Peregrine

sugar comments.

• The most important tip to protect yourself from EM is to wash your hands, Peregrine advises. “It is very important
for dog owners (and outdoor cat owners, though felines
are not at risk) to wash your hands after handling their pets to prevent exposure.”

• Pet owners and veterinarians can visit emontario.com for more information about EM in Ontario.

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BEST FRIENDS MAGAZINE IS PUBLISHED TWO TIMES PER YEAR BY OVC PET TRUST

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How can I heal if you won’t let me sleep?

The key to unlocking the answers to many of these questions lies in circadian rhythms, says Tami Martino, director of the University of Guelph’s Centre for Cardiovascular Investigations and associate professor at the Ontario Veterinary College (OVC).

Circadian rhythms are found in all living organisms, including humans, animals and plants. Often referred to as the body’s biological clock, these rhythms follow the 24-hour daily cycle of our earth and help us adapt to light and dark, signal when to be active and when to rest and indicate when to sleep and be awake. Circadian rhythms are important for many critical body functions including the way that we heal from disease or injury.

When rhythms are disrupted, the body fails to receive the correct signals to function at an optimal level. Since up to 25 per cent of the population engages in shift work at some point in their working career, travellers frequently deal with jetlag and people commonly suffer from sleep disorders—there are many situations where circadian rhythms can be disrupted in our everyday lives.

Martino’s research reveals that even short-term disruption of circadian rhythms, such as that experienced in ICUs and hospital wards, may worsen a patient’s long-term outcome.

“The first few days after a person suffers a heart attack, immune cells flood into the heart to clear away the debris and damage. A scar forms and the heart has to adapt to the damaged area. Over time this can lead to heart failure for the patient,” Martino says. “Our studies showed that when circadian rhythms and sleep are disrupted during this critical early healing period, the immune cell responses are altered leading to larger scars and worse outcomes. If we can control something like light and noise that can disturb our body’s rhythms and sleep during those crucial couple of days after a heart attack, we can minimize scarring and the patient has the potential to live a longer, healthier life.”

Can it really be just that simple? Martino is particularly interested in studying heart disease, but she says the principle is relevant any time there’s a healing inflammatory reaction in cases like a trauma, such as being hit by a car, burns or a traumatic brain injury. Martino stresses that we may have the potential to improve health outcomes in these areas by recognizing the impact circadian rhythms have on healing.

“In human medicine, disruptions to circadian rhythms in ICUs occur with light, noise and frequent staff checks, is already helping human patients. This new field of study also has the potential for translational benefits to improve the health and well-being of our animal companions as well.”

Martino’s research shows that maintaining circadian rhythms and sleep in ICUs is a therapeutic manipulation that can prevent, slow or reverse damage. Martino’s ICU findings indicate that simple modifications can be made to help maintain circadian rhythms and sleep, such as sound-proofing and light-proofing (especially eliminating blue wavelengths of light at night) in certain areas. Other changes, such as relocating computer screens away from patient areas and adjusting the shifts or timing of staff checks, is already helping human patients.

“We have a tremendous, timely opportunity to apply our findings at OVC to benefit animal patients and lead the way into unchartered territory within the world of veterinary medicine,” Martino says. “Our research as leaders in circadian medicine has the potential to impact both human and veterinary hospital design and, more importantly, improve the health and welfare of all species.”

The power of sleep

All life on earth is subjected to a 24-hour day and night (circadian or diurnal) cycle, which is controlled by tiny molecular clocks inside our cells. These clocks help us know when to be active or rest, awake or asleep.

Martino’s research shows that maintaining circadian rhythms and sleep in ICUs is a promising non-pharmacological way to improve outcomes for patients. While Martino’s focus is on new treatments for heart disease, her findings may also be applied to a broad range of clinical priorities including mental health, cancer biology, women’s health, microbiome and gut health, sleep, shiftwork, exercise and diet.

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In photo: Jordan Sackman

The Magic of BUDDHA

Sometimes a dog comes into your life and changes everything. From the moment Kat Osen and Jordan Sackman welcomed Buddha into their lives in 2009, it was never the same.

“The stars aligned, and Buddha became the light of our lives,” Kat smiles. “He had a stoic, calm nature about him; he absolutely loved playing in the snow, and he was a faithful companion. He stayed by my side when I was in labour with our first-born child, helped us welcome his littermate and sister Flare into our home at the age of two and he was a certified therapy dog, volunteering at long-term care facilities, libraries and kindergarten classes,” she reminisces.

Kat and Jordan remember seeing their five-year-old black Newfoundland for the first time after his amputation in December 2014. Shortly after he was diagnosed with osteosarcoma. “He came bounding down the hallway to the Ontario Veterinary College (OVC), on three legs, with his favourite Winnie the Pooh stuffed animal he’d had since he was a puppy in his mouth, and excitedly greeted us,” Kat says.

Osteosarcoma is an aggressive cancer that causes destruction of the bone when cancer cells form a tumour — sometimes the bone can even break because it’s so weak and causes very painful clinical signs and ulcers. Dogs and humans who are diagnosed with this disease. When a dog is diagnosed, 90 per cent of patients have already had tumour cells spread to other parts of the body, which can be difficult to detect. The standard of care for dog patients with bone cancer is amputation, followed by chemotherapy; it commonly spreads to the lungs, and unfortunately there is no therapy once this occurs.

“Medically, Buddha’s case was extremely unusual. He survived much longer than the average patient and he ultimately developed another bone tumour that could either represent spread of his original tumour or another primary site of osteosarcoma. No other evidence of spread of the bone cancer was ever detected,” says Dr. Danielle Richardson, board-certified veterinary specialist in internal medicine and medical oncology at OVC’s Mona Campbell Centre for Animal Cancer. “If Buddha hadn’t been treated, he would have died within a couple of months of his diagnosis. Fortunately, we were able to extend his life for beyond the norm and he was able to enjoy a better-quality and quality of life with his family who love him so much.”

Buddha’s family believes he came into their lives for a reason.

“We did anything and everything we could for him. His spirit throughout battling cancer was incredible,” Jordan says.

Kat and Jordan donated Buddha’s blood and tissue samples to the OVC Companions Animal Tumour Sample Bank, which now houses more than 23,000 samples that will be used for future research aimed to unlock answers to a wide variety of cancers that affect both humans and pets. Buddha’s owners also gave the harness their dog used following his surgery to the OVC’s animal cancer centre with a heartfelt letter to pass along to the next client and pet who may benefit from it. They hope that Buddha’s contributions will help the scientific community learn from his case and that the harness will offer a little bit of relief for the next dog in need of wearing it.

“Our experience was helpful for them. They decided to go ahead with the surgery and soon enough, Miller was once again pain-free, as every dog should be, back out and about on all four legs, enjoying his ball and awesome family. See back then, this was Miller’s harness, given to him by his parents who did everything they could to support and shower him with incredible love. Tragically, my buddy Miller’s time came way too soon, and so, with all of the love and gratitude that fills their hearts, Miller’s parents left this harness at OVC for me. To honour Miller’s legacy, his gift to me, as well as the courage and love of his mom, dad and little brother, my dad embroidered ‘A Hug from Miller’ on the inside of the harness, and every time he put the harness over my head, dad would say “Here buddy boy, here’s a hug from your buddy Miller, Nelson’s son, such a good, good, boy.”

For well over three years and against all odds, I enjoyed the supporting comfort of Miller’s harness. “I honestly don’t know if I could have done it without him. Miller, I love you brother, and my heart overflows with gratitude, buddy.”

“I was off getting one of my post-op chemo treatments, my dad met some lovely people in the waiting room at the OVC, animal cancer centre, and they were going through a really hard time. They were the parents of the best friend I never met — a kind, gentle, beautiful soul named Miller the Newfoundland. Miller’s parents had, as I’m sure you’ll understand, a really hard decision to make. So, I had my amputation, treatments were underway, and I was feeling pretty damn good considering. So, my experience was helpful for them. They decided to go ahead with the surgery and soon enough, Miller was once again pain-free, as every dog should be, back out and about on all four legs, enjoying his ball and awesome family. See back then, this was Miller’s harness, given to him by his parents who did everything they could to support and shower him with incredible love. Tragically, my buddy Miller’s time came way too soon, and so, with all of the love and gratitude that fills their hearts, Miller’s parents left this harness at OVC for me. To honour Miller’s legacy, his gift to me, as well as the courage and love of his mom, dad and little brother, my dad embroidered ‘A Hug from Miller’ on the inside of the harness, and every time he put the harness over my head, dad would say “Here buddy boy, here’s a hug from your buddy Miller, Nelson’s son, such a good, good, boy.”

Editor’s Note: Buddha died on February 23, 2018 at the age of eight, three years to the day after finishing his chemotherapy treatments at OVC and surviving three and a half years after being diagnosed with bone cancer.

The waiting room at the Ontario Veterinary College’s Mona Campbell Centre for Animal Cancer is a very special place. It is a space where pets meet each other, commonly share their stories and, often, bond over their experiences with their pet’s cancer treatment. This heartfelt letter tells the story of connections made and it will accompany Buddha’s (and Miller’s) harnesses when it is given to the next dog in need. It is written by Jordan Sackman, in Buddha’s voice — from one dog, to another.
Emergency medicine and critical care is the beating heart of a tertiary care hospital, with the most serious, critical patients coming through the doors. Every year, nearly 2,500 animals, 60 per cent of the pets referred for advanced care to the Ontario Veterinary College (OVC), require care in OVC’s Intensive Care Unit (ICU). The ICU plays a crucial role as a central hub within the hospital, for pet owners and for their referring veterinarians. Patients from all OVC’s services frequent the ICU from cardiology to neurology to oncology, referring veterinarians. Patients from the hospital, for pet owners and for their veterinary colleges. Every year, nearly 2,500 animals, 60 per cent of the pets referred for advanced care to the Ontario Veterinary College (OVC), require care in OVC’s Intensive Care Unit (ICU). The ICU is open to offer care to the most critically ill patients. The number of hours per day OVC’s ICU is open to offer care to the most critically ill patients.

The percentage of pets referred to the OVC Companion Animal Hospital that require care or are being treated for an immune-mediated disorder, whether they are being treated for an immune-mediated disease that may be causing anemia or suffering from blood loss from a trauma such as being hit by a car, receiving a transfusion can be a matter of life and death. OVC has its own in-house Blood Donor Program, where volunteer dogs donate approximately 240 units of blood every year to help the critical patients who need it to survive.

Blood transfusions, transferring components of blood to a pet, are commonly performed on dogs and cats in OVC’s ICU. Whether they are being treated for an immune-mediated disease that may be causing anemia or suffering from blood loss from a trauma such as being hit by a car, receiving a transfusion can be a matter of life and death. OVC has its own in-house Blood Donor Program, where volunteer dogs donate approximately 240 units of blood every year to help the critical patients who need it to survive.

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GETTING TO THE HEART OF THE MATTER
SEARCHING FOR ANSWERS FOR A COMMON HEART DISEASE IN CATS

Dr. Sonja Fonfara is passionate about the study and treatment of heart disease in cats. Her quest is to improve the health and welfare of our feline friends by investigating a common heart disease called hypertrophic cardiomyopathy (HCM). Fonfara says, “Identifying that a cat might have HCM can be difficult and unfortunately predicting how it will progress in a specific cat patient is often not possible.” Fonfara is now working to identify specific pathways responsible for influencing the severity of the disease. This may eventually allow clinicians to use bloodwork as a diagnostic indicator to accurately measure how a cat’s disease is developing.

The average onset of HCM happens when a cat is approximately six to eight years of age, but cats of all ages can get the disease. Humans can also develop HCM and the condition is known to be genetic. It is suspected that HCM in cats is genetic as well. Veterinary researchers know that some cat breeds are predisposed to developing HCM. Ragdoll and Maine Coon cats, for instance, are found to be affected more often than other breeds.

“Once a cat is in heart failure, supportive care plans are required to both stabilize the patient and offer the best quality of life possible. Unfortunately, there is nothing that can be done to reverse it,” Fonfara says. The limited knowledge of how HCM develops, progresses and impacts the lives of cats is what has led Fonfara to investigate this disease further.

“As we currently cannot prevent the onset of HCM or understand the varied speeds in which it develops, our work aims to identify the factors involved in these processes, which may improve diagnosis,” Fonfara says. “We also hope to give cat owners and veterinary care teams a better idea of what to expect as the disease advances and provide improved, more informed, individual care plans.”

IN DOGS AND CATS

SIGNS OF HEART DISEASE

Dogs and cats with congestive heart failure live significantly longer when its condition is co-managed by a board-certified specialist in cardiology and a primary care veterinarian.

THE HEART FACTS

- Anatomically, human hearts are very similar to those of dogs and cats.
- While there are size differences, the function is essentially the same.
- While the cardiovascular systems of cats, dogs and people are similar in many ways, there are differences with the way heart diseases present, progress and are treated.
- The most common form of heart disease in cats and dogs involves the heart muscle itself – cardiomyopathies. In dogs, valvular disease is also common.
- Coronary heart disease, when plaque builds up in arteries, which commonly occurs in humans and can result in heart attacks, is not observed in cats and dogs.

**SIGNS OF HEART DISEASE IN DOGS AND CATS**

Pet owners may consider visiting their veterinarian if their pet experiences any of these clinical signs:

- Difficulty breathing
- Increasing or new cough (in dogs)
- A heart murmur and/or change in heart rate
- Fainting or collapsing
- Abdominal swelling or distention
- Less tolerance to exercise

**DIFFICULTY BREATHING**

Commonly occurs in cats and dogs.

**INCREASING OR NEW COUGH (IN DOGS)**

In cats and dogs.

**A HEART MURMUR AND/OR CHANGE IN HEART RATE**

In many ways, there are differences with the way heart diseases present, progress and are treated.

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Dr. Elizabeth Stone vividly remembers the day she met Mona Campbell at her farm in Puslinch, Ontario in 2005. She and University of Guelph (U of G) professor Ian Duncan arrived at Mohill Farm, known for its numerous award-winning show horses and cattle and beautiful rose gardens, to find Campbell working in her flower garden. Campbell had long admired the work of Duncan, who was the major force behind the internationally recognized animal welfare program at the U of G. From that day forward, a new friendship blossomed. Campbell sent Stone home with fresh-cut flowers after their first meeting, and over the years that followed they developed a close relationship. The two women, both in their own respective leadership roles — Campbell as CEO of Dover Industries and Stone the first female dean of an accredited veterinary school in North America — discussed the challenges of leading organizations and moving initiatives forward.

“I valued her wise counsel, her dry sense of humour and her dedication to animals,” Stone says, adding that “she shared her farm with cattle, horses, chickens and of course her dear dogs. Mona was always very interested in the welfare of animals, and in what new procedures and treatments were being developed at OVC. Research and progress were important to her.”

A new gift has been made in honour of Stone, who served as OVC dean between 2005-2013. The funds will create a dedicated endoscopy unit as part of the new surgery and anesthesia facilities in the OVC Companion Animal Hospital.

“I am grateful to be honoured in such a meaningful way,” Stone says. “I am very thankful to Mona’s daughters, Sarah Band and Vickee Macae, for directing this gift in recognition of my friendship with their mother.”

Values that the support that Band and Macae have themselves provided for companion animal health, which has helped OVC in a variety of areas and improved the health of animals and the learning opportunities for students. Campbell had a long-standing relationship with the U of G, supporting programs and efforts related to animal welfare and equine health for more than two decades. The OVC cared for many of her animals over the years. After her death, the U of G received $9.5 million to advance the areas that were most meaningful to her — companion animal health and animal welfare research and education. At the time it was the largest single donation ever given to the U of G. Half of the funds were used to fully endow a chair in companion animal welfare in the name of her late husband, Col. K.E. Campbell. The other half supported OVC Pet Trust’s campaign to create Canada’s first comprehensive animal cancer centre, which was named The Mona Campbell Centre for Animal Cancer in her honour and began operation in 2012.

During her lifetime Campbell was recognized as an outstanding business leader. The U of G awarded her an honorary doctorate in 1994 and she was named to the Order of Canada in 1996. Her philanthropy benefited many organizations. As Stone explains, “Mona Campbell’s legacy will benefit many generations far into the future.”

Dr. Michelle M. MacRae, Chair of the RVT program at the University of Guelph, and Kathy Taylor, a Registered Veterinary Technician (RVT) who completed OVC’s Companion Animal Hospital each year. Registered Veterinary Technician (RVT) Kathy Taylor has spent the past 25 years of her career working on the floor of OVC’s ICU, caring for some of the most critical animals that are admitted to the tertiary referral hospital. As an RVT, Kathy’s job is to support and care for every pet that passes through the ICU doors. She is part of a comprehensive medical care team led by ICU Service Chief Dr. Alexa Beresford, an OVC faculty member and a board-certified Veterinary Emergency and Critical Care Specialist. Our ICU is a mainstay of the emergency and critical care service at OVC — a key part of the tertiary care at the University of Guelph. It is a busy, fast-paced environment that requires immediate treatment or intervention to help save the patient’s life.

OVC faculty are at the forefront in developing new endoscopic techniques in animals. The new endoscopy suite within the OVC Companion Animal Hospital will provide the most critical animal patients and pet owners whose animals are in need of care.

Used in both human and veterinary medicine, endoscopy is a type of minimally invasive procedure that lets clinicians see and work inside of the body. It uses an instrument called an endoscope, or “scope” for short. The scopes are long, flexible tubes that have a tiny camera at the end and also channels for passing very small instruments. The scope is passed into the windpipe (trachea) or food tube ( esophagus) or other body passageways or openings into such organs as the lungs (bronchoscopy), bladder (cystoscopy), stomach (gastroscopy) or colon (colonoscopy).

Procedures that can be performed include examining the internal anatomy, taking biopsies, removing foreign body and treating conditions such as bladder stones.

Endoscopy is usually performed at a tertiary care veterinary hospital, such as the OVC Health Sciences Centre because the specialized equipment is expensive and the aftereffects complicate diseases require collaboration between specialists.

Welcome to the world of emergency and critical care, a complex area of veterinary medicine which often involves constant monitoring and comprehensive, multidisciplinary care for its patients. Every pet has a different story unfolding simultaneously in the Intensive Care Unit (ICU) at the Ontario Veterinary College (OVC). One pet may be undergoing advanced diagnostics to determine what is its illness, injury or condition might be. Another may be waking up from a life-saving procedure in need of constant care and supervision while it recovers. Another pet may be struggling with a serious medical emergency that requires immediate treatment or intervention to help save its life.

Thousands of companion animals with the most serious and life-threatening medical conditions are referred to the OVC Companion Animal Hospital each year. Registered Veterinary Technician (RVT) Kathy Taylor has spent the past 25 years of her career working on the floor of OVC’s ICU, caring for some of the most critical animals that are admitted to the tertiary referral hospital. As an RVT, Kathy’s job is to support and care for every pet that passes through the ICU doors. She is part of a comprehensive medical care team led by ICU Service Chief Dr. Alexa Beresford, an OVC faculty member and a board-certified Veterinary Emergency and Critical Care Specialist. Our ICU is a mainstay of the emergency and critical care service at OVC — a key part of the tertiary care at the University of Guelph. It is a busy, fast-paced environment that requires immediate treatment or intervention to help save the patient’s life.

Much like a relay, the day begins with rounds, essentially the careful passing of the “baton” from one team member to another. Kathy rounds with nightshift RVT Michelle, reviewing each patient’s case that is currently under their care. Rounding helps facilitate the transfer of care between shifts, which are typically 12 hours long for RVTs in the ICU.

“Kathy has helped a toy Poodle who is on a mechanical ventilator,” Kathy Meneley, a RVT at the University of Guelph. “Kathy’s job is to support and care for every pet that passes through the ICU doors. She is part of a comprehensive medical care team led by ICU Service Chief Dr. Alexa Beresford, an OVC faculty member and a board-certified Veterinary Emergency and Critical Care Specialist. Our ICU is a mainstay of the emergency and critical care service at OVC — a key part of the tertiary care at the University of Guelph. It is a busy, fast-paced environment that requires immediate treatment or intervention to help save the patient’s life.

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Due to the large number of patients treated in the ICU, RVTs are required to maintain a high level of clinical competence and critical thinking skills. This is achieved through regular in-service training and ongoing education. RVTs are also required to maintain a high level of clinical competence and critical thinking skills. This is achieved through regular in-service training and ongoing education. RVTs are also required to maintain a high level of clinical competence and critical thinking skills. This is achieved through regular in-service training and ongoing education. RVTs are also required to maintain a high level of clinical competence and critical thinking skills. This is achieved through regular in-service training and ongoing education.
"TPR" – temperature, pulse and respiration – important vital signs that are measured frequently in ICU patients. There are about 10 veterinary professionals in the room from various services, tending to patients and heading off in all directions.

8:15AM: The ICU is reasonably calm this morning, says Dr. Bersenas, smiling, when sich and in take RTV, Deb, rushes into the room to consult with her. Dougall, a Bernese Mountain Dog cardiologist patient recovering from surgery, erupts in barking as a Labrador Retriever who is recovering from a fever and skin inflammation, is being moved into the wards by an animal care attendant.

8:20AM: The ICU houses the most critical patients. A general area within the main space acts as an "emergency room" component for intake and assessment of new patients. Off the main space is the ICU Quiet Room, a special area separate for cat patients. This morning Kathy checks on two feline patients: one is recovering from insecting a foreign body. Another cat, Eddie, is being examined for possible internal bleeding. A special diffusor, much resembling a plug-in air freshener, helps provide cat patients with a calming, comforting and de-stressing environment. An intermediate care zone, a separate room connects the ICU, designated for less critical cats and to help with the overflow of patients requiring care.

10:01AM: Each hour in the ICU brings new patients, challenges and situations. OVC’s ICU is home to numerous advanced treatments and specialized equipment. Today Kathy has a one-hour training session scheduled on the clinic floor to further her professional development in thrombolastogram (TEG), or how to assess blood clots in pets, which will help her evaluate the patients in her daily job. Kathy is a Veterinary Technician Specialist (VTS) certified in emergency and critical care and takes pride in staying up-to-date on the most innovative practices in her field. "Our role as RTVs is to provide front-line nursing support," explains Kathy, adding that she regularly troubleshoots with the veterinarians on their team.

11:16AM: Kathy has an overwhelming calmness to her, while being a force multi-tasker in a dynamic, sometimes frantic environment. She uses the word "drains" to refer to critical incidents. Currently there is only one dog on a ventilator, and most of her other patients are stable, with minimal "drains" so far today. "That’s good,” she smiles, “Our ICU is often at capacity. We manage at best as we can.” Keeping tabs on each patients’ blood work, vital signs and medical charts, she is accurate and up-to-date and adjusting fluids as needed keeps the team busy. A Weimaraner dog who has had trouble emptying his bladder is due for his medication.

12:00PM: Kathy helps take a blood glucose test on a diabetic Miniature Schnauzer, using a glucometer device similar to the one used for people to manage diabetes. There is never a spare moment. RTVs Julie and Beth re-bandage Marley, a Chocolate Labrador Retriever. "We watch bandages and dressings closely, and change them frequently," Kathy says.

12:08PM: Emergency referral patient Charlie, a nine-year-old Gocker Spaniel, arrives in the ICU. Dr. Sabrina Ayoub is the dayshift emergency intern today; in consultation with the team, she assesses incoming emergency cases, admits patients and makes plans for care determining if the pet needs surgery or to be transferred to another specialty service at OVC. RTV Debtriages incoming patients and helps with intake, getting owners settled in a private room, taking patient history and the pet’s vitals.

4:02PM: Dr. Tiffany Jagodich begins her shift, a third year Doctor of Veterinary Science (DVMs) student. She coaches intern Dr. Ayoub on talking to Ginger’s owner about the risks of inserting a chest tube, which she will require to treat her pneumothorax, the cause of her collapsed lung. "We hope it will be our fix but there are never guarantees.”

5:06PM: Kathy sits calmly with Ginger, resting a gentle hand on her body as she offers visits her, understandably emotional. "If pet owners are stressed and worried about their pet during the day, or laying awake in the middle of the night, I want them to be assured that someone on our floor is thinking of their pet too,” Kathy says. “I talk to my patients as if they were people,” Dr. Jagodich confesses, smiling. “It can be hard for pets to be in an unfamiliar environment. I like to think of it as explaining what is happening or what I am doing, it will bring them some comfort.”

6:31PM Kathy’s 12-hour shift has come to an end, but OVC’s ICU is staffed 24 hours a day, 7 days a week, 365 days a year. Two nightshift RTVs finish rounds with Kathy, the "batons" have been passed and they have taken over for the night. Dr. Jagodich will be here for most of the evening. She places the chest tube in Ginger, an intricate procedure, and immediately the dog is able to breathe better, her chest rising and falling more normally. Even though Ginger isn’t out of the woods yet, she is now able to breathe more comfortably. "It’s powerful what one procedure can do to help a life. Isn’t emergency medicine the best?”
Imagine you’re at a giant sports stadium with millions of people. Now imagine every person yelling the word “goal!” at the exact same time. The possibility of that unified shouting would be overwhelming and a rare occurrence.

In a nutshell, this is how Dr. Fiona James would try to very simply describe a seizure to a pet owner: in this analogy the sports stadium is the brain, the millions of people in the crowd are the neurons (specialized cells in the brain) and the word they cheer for is the word “goal!”

James explains her work as a veterinary specialist (to measure, record and analyze a seizure) with the same analogy—it involves placing very precise microphones located in the ceilings throughout the stadium (the brain) to try to pick up the words being spoken in the crowd (seizure) to better decipher what’s being said by the people (neurons).

The “microphones” she uses are a component of a monitoring method to record electrical activity in the brain called electroencephalography (EEG). Conducting an EEG involves placing tiny, non-invasive electrodes on the head. By interpreting the brain waves of data transmitted by the microphones (electrodes), neurologists can diagnose and decode what type of seizure a patient may be experiencing. In the comparison, a generalized (grand mal) seizure would be every single person in the crowd saying the same word. A focal (petit mal) seizure would be half the stadium saying the same word. The analogy isn’t perfect; in reality it is much more complex, but the story helps many pet owners understand the mechanics of a seizure.

“Seizures and epilepsy in dogs using awake EEG, a gold standard in human medicine. EEGs in veterinary medicine are performed by neurologists and have historically been conducted when the pet is under sedation or general anesthesia. But since clinicians can better detect seizures when patients are awake and moving around normally, James adapted a belt pack unit used in human medicine into a backpack for her canine patients, a first in the veterinary world. The backpack holds a wireless transmitter which records brain activity while the dog is awake and sends data back to a computer for analysis. She is one of only a handful of people worldwide who are experts in placing EEG electrodes and interpreting awake EEG recordings in dogs, and she has worked extensively with collaborators and mentors at Toronto’s Hospital for Sick Children ( SickKids) in her quest to better understand canine epilepsy.

James is currently gathering and analyzing data captured by EEGs in dogs around the world. Her goal is to make EEG tests easier, better and faster. Working with a number of global specialists, she hopes the data will help establish patterns and eventually lead to guiding treatment decisions in pets.

“We know that, unfortunately, 30 per cent of dogs with epilepsy do not respond to their medications. In veterinary medicine, we currently do not have recommendations based on scientific evidence for why one treatment may work better than another,” James says.

James is also involved in collaborative work at OVC studying how stem cells develop in the brains of epileptic patients and the role big data may play when comparing EEG seizure data in dogs versus humans.

“Many dogs with epilepsy can manage their disorder with treatment from their primary care veterinarian and have a very good quality of life. The better we can get at EEG, the more we can understand about the disorder and help the patients who have difficulty controlling their seizures have more good days than bad ones with their families,” James says.

What is Epilepsy?

Epilepsy is defined as a disorder of the brain characterized by an enduring predisposition to generate epileptic seizures. This definition is usually practically applied to a patient who has had at least two unprovoked epileptic seizures less than 24 hours apart. The term “seizure” is used for any sudden, short-lasting and transient event, but it does not necessarily imply that the event is epileptic.

What to do if your dog has a seizure.

A seizure is a major metabolic event and has a significant impact on the brain and body as a whole. If you suspect your pet has had or is having a seizure:

- Keep your pet cool. Seizures can cause a dog’s core body temperature. Provide water and air conditioning if possible. Spray cold water on their feet and put ice packs in their arm pits.

- Never put your hands in or around the mouth of a pet who is having a seizure. They may bite their tongue, but they will not swallow it. Since dogs are usually unconscious during a seizure, they may bite or cause injury to people.

- If you need to move your pet to a safe place or out of the direct sun while they are having a seizure, roll them onto a blanket and drag them on it to move them.

- Many dogs will be confused and disoriented after a seizure. Keep a close eye on them to make sure they’re safe until you can contact your veterinarian to discuss next steps.
For the first known time in North America, Ontario Veterinary College (OVC) board-certified veterinary surgical oncologist Dr. Michelle Oblak led a successful reconstructive skull surgery implanting a custom 3-D printed skull plate in a dog. When Patches, an eight-year-old dachshund, presented to Dr. Galina Hayes at Cornell University’s College of Veterinary Medicine with a large cancerous growth on her skull, Oblak’s former OVC colleague, and soft tissue surgeon, contacted her for advice on the difficult case.

As a veterinary surgical oncologist and an assistant professor in soft tissue surgery at the OVC, Oblak has a special interest in canine skull tumours and she recently published a book chapter on the topic. She has also been researching better ways to develop surgical plans and reconstruct the skulls in these patients. As part of this work, Oblak is a member of the OVC RAPID (rapid prototyping of patient-specific implants for dogs) team. The group is looking at the feasibility of 3-D printed materials and rapid prototyping for surgical planning and patient-specific, personalized implants for dogs. Rapid prototyping involves constructing a model using 3-D computer-aided design data. When she had heard about Patches and her CT scans, she thought that it might be the perfect case to offer this up-and-coming, cutting-edge surgical option.

Since the cancerous tumour was growing within the bone of Patches’ skull, the surgical team estimated they needed to take out almost 75 per cent of the top area of her skull that covered her brain in order to remove as much cancer as possible.

“Given the complexity of the area and the amount of brain exposed, we knew we would need some sort of reconstruction after removing the tumour,” Oblak explains. “We also wanted to plan our surgical approach in advance, especially if we wanted to save Patches’ eye, which was being threatened by the tumour’s aggressive growth.”

Working with Dr. Alex zur Linden, a board-certified veterinary radiologist at OVC, and John Phillips, an engineer with Sheridan CAMDT, Oblak imaged and built a 3-D model of Patches’ skull. The team then worked in collaboration with ADE-3D, a company that develops 3-D printed medical devices for human medicine, to access software designed for mapping and modelling human skulls for her dog patient. The software allowed her to plan the anticipated skull defect, as well as, design and print a custom titanium plate for Patches’ upcoming surgery. Less than a month after receiving Hayes’ phone call, with a physical skull model and personalisation data for Patches’ skull, Oblak travelled to the United States to lend her expertise to the case. Oblak and Hayes performed the three-hour surgery this past spring in New York. After removing the tumour, the implant was placed to protect Patches’ brain and soft skull tissue, and it fit perfectly. Oblak says without the technology, the team may have spent up to an additional two hours in the operating room, contouring a titanium mesh, an option that would not have had the same cosmetic outcome for Patches as the custom 3-D implant.

The surgery was an overwhelming success. Patches woke up normally from general anaesthesia following the procedure and was alive and looking around within a half an hour. Oblak was able to offer a customized, state-of-the-art 3-D printed implant option to a canine patient and their family for the very first time in North America.

“I am thrilled I had the opportunity to provide something as ground-breaking as this procedure for a dog,” Oblak says. “The benefits of incorporating 3-D print technology into veterinary medicine are, and will continue to be, incredibly impactful — allowing us to offer faster, safer and improved surgeries for our pets. The benefits apply well beyond reconstructive surgery like Patches’. 3-D printed implants also have the ability to help in trauma, limb-deficiency and fracture cases as well,” she explains, adding that there is remarkable potential for rapid prototyping to help both humans and animals alike.

Oblak says one of the best parts of working in academia is to explore new, different and better ways to help her patients. “Innovation and progress is what inspires me each and every day.”

“I am thrilled I had the opportunity to provide something as ground-breaking as this procedure for a dog.”

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**Cancer SURGEON pushes boundaries for animal health**

3-D IMPLANT SURGERY, FIRST IN NORTH AMERICA

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Photo reel, images from top to bottom:
- Patches with her tumour, prior to surgery; Patches’ tumour with Oblak’s 3-D printed model, used to create the surgical plan; Dr. Oblak and Hayes conducting Patches’ surgery at Cornell University; Oblak shows how the Titanium 3-D printed plate will fit on Patches’ skull with his 3-D model.

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Feature photo Dr. Michelle Oblak. Surgery photo credit: Dan Lopez.
Harnessing the Impact of BIG DATA to Advance Insights into Pet Health

What if there was a way to predict and respond to natural disasters? What if you could help track climate change by documenting when your skating rink freezes from your own backyard? What if blockchain, the intricate technology behind the cryptocurrency Bitcoin and a powerful tool for efficiency, could regulate the complex global food supply system?

These are only a few of the applications of the use of big data in our everyday lives, and all these examples are currently being shaped across the world today. From safe food production to improved animal health, researchers at the University of Guelph are also working with big data, enabling people to make more informed decisions, making it at a speed that has never been possible before.

Big data involve extremely large data sets that may be analyzed using artificial intelligence (AI), such as machine learning, to aggregate and identify patterns and trends and it is revolutionizing many industries. Big data has been dubbed as “the new oil” and many believe that our future may in fact depend on it. Dr. Theresa Bernardo, a professor in the department of Population Medicine at the Ontario Veterinary College, is the IDEXX Chair in Emerging Technologies and Bond-Centred Animal Healthcare. Her team is currently using big data to look at how we can accurately predict the average weight of cats over their lifetimes to allow for a more personalized model of medicine and preventive approach to healthcare.

In the veterinary world, there is already a great deal of data used as a preventive tool within agriculture for production animals such as cattle and sheep, but we haven’t yet made full use of population data to prevent or predict illness in companion animals. Instrumental in Bernardo’s quest to find answers is IDEXX Laboratories, Inc., a leader in pet healthcare innovation, serving veterinarians around the world in 175 countries with a broad range of diagnostic and information technology-based products and services. IDEXX has provided Bernardo’s team with health data from 19.4 million cats collected over a 35-year period, from 1981 to 2016. Statistics include age, gender, breed, weight and reproductive status. Having access to this amount of data for cats is unprecedented and it has helped her team generate models to be able to accurately predict the average weight of cats as they age. “There is a unique opportunity to combine this information with diagnostic test data and gain valuable insights into the interactions between weight and health as well as potential interventions to increase the number of years of healthy life for our pets,” she says. She also suggests that discussions about body weight throughout a pet’s lifetime could be a useful gateway to engage more cat owners in the health of their pets.

Data points

- The number of cat health records IDEXX supplied to Bernardo’s team to analyze and accurately predict the average weight of cats.
- The number of years from 1981 to 2016 data from millions of cats was collected and examined for this study.
- The age range Bernardo’s team discovered that cats tend to lose weight during their lifetime.
- IDEXX is uniquely positioned because of their relationship with IDEXX and opportunities are evolving as technology drives change.
- “Our team works collaboratively across campus at the University of Guelph with world-caliber experts who specialize in computer science and machine learning to drill down on what we can learn from this data and map out trends.”

BERNARDO’S TEAM

- Bernardo is an international leader in addressing complex health problems through technology and has experience using emerging technologies to save lives in disasters, including the worldwide flu epidemic (H1N1) and Haiti earthquake. Her work at the Ontario Veterinary College (OVC) aims to improve the health and well-being of animals, their caregivers and communities.

“Technology is a tool for both veterinarians and pet owners. We are making important advances, both in clinical outcomes that can improve and lengthen the lives of pets, and in how veterinary students and practicing veterinarians can access, interpret and use big data to improve their patients’ health.”

“A pet’s weight is an easy point of entry into data-driven animal wellness,” Bernardo explains. “The monitoring of body weight is an important indicator of health in both humans and animals. It is a data point that is commonly collected within each medical appointment and it is accessible and simple to monitor at home.” Bernardo’s team has been focused on looking at patterns of weight gain and loss over the lifetime of a cat. Questions her team seek to answer included: when do cats become skinny? What is average weight loss over time? What is the projected average weight for a cat based on breed, gender and reproductive status? Since most animals die from chronic diseases versus infectious diseases, Bernardo hopes their work can help pet owners understand what weight gain and loss looks like over a cat’s lifetime and what we can predict from this data about their current and future health on an individual level. Next steps will be to look at the potential impact technology, such as sensors and automated feeders, may have in achieving healthy weights for cats and strengthening the human-animal bond.

“Thanks to the information IDEXX has provided, we now know that cats tend to lose weight between six and 10 years of age, depending on their breed, gender and whether or not they have been neutered or spayed.”
Thank you so much for helping me and my dog. You people are all amazing!” says a dog owner.

“Ultimately, everything we do to give back is our way of repaying the pets in our lives for all that they give us. I think that really sums it up,” Johnson says. “Our pets give us so much; it’s the least we can do.”
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GETTING TO KNOW... DR. NOEL MOENS
SMALL ANIMAL SURGEON AND ASSOCIATE PROFESSOR
DEPARTMENT OF CLINICAL STUDIES
ONTARIO VETERINARY COLLEGE
UNIVERSITY OF GUELPH

Why did you pursue a career in veterinary medicine?

Why surgery?

I have always wanted to be a veterinarian for as long as I can remember. I have never wanted to do anything else. I grew up in the country, surrounded with pets of all kinds. My interest in surgery came to me during veterinary school. I quickly developed an interest in surgery and immediately developed a passion for orthopedics, the area of medicine that deals with the correction of deformities of bones and muscles. I started volunteering in the operating room during my second year of veterinary school and have never looked back. I have always enjoyed building and fixing all sorts of things...so fixing bones just seems to be a perfect fit and my career has been completely focused on orthopedics since then.

What research projects are you currently working on?

Right now, I am working on a project that looks at plates used for the repair of bone fractures. In particular, I am studying the effect of the screw configuration (how many are used and where they are placed on the plate) and how it affects the plate’s resistance to bending. Pet owners may assume that surgically fixing a bone only involves placing a plate on it and all should be fine. This is actually not the case; many decisions have to be made by the surgeons to ensure our patients recover and have the best possible outcome. The majority of the time we get it right but occasionally we see plates break before the bone has time to heal. The more information we have to help us make the right decision, the less likely it is to fail. Another project I am involved with is to find a repeatable and accurate method of measuring bone deformities associated with patellar luxation. Patellar, also known as the kneecap, luxation is a frequent disease affecting small breed dogs but is becoming more frequent in large breeds as well and occurs when the kneecap is dislocated from its normal position. It is often caused by limb malalignment caused by developmental reasons in the hind leg. In the past, correction of the problem was resolved by replacing the kneecap back into position but without addressing the root of the problem, which is the limb deformity. Although this technique works well in mild cases, more severe cases typically suffered from a recurrence rate as high as 40 per cent. The main reason why the deformities were not corrected before was the difficulty to obtain accurate measurements of those deformities using diagnostic imaging. Today, CT scanners have become widely accessible and they allow 3-D images of the bone to be taken. The images generated from the CT allow us to measure all the deformities with much greater accuracy and precision compared to in the past. With my research team, we are developing techniques to measure these deformities and hopefully improve the results of the surgery for our patients suffering with severe limb deformities.

What impact does OVC Pet Trust funding have on your research?

OVC Pet Trust has provided funding for most of my research. Not only has Pet Trust provided funding to me, but it has also supported many of my surgery residents’ projects as well. Pet Trust aligns with my primary focus, which is clinical-based work and discovery to help pets.

What will the new surgery and anesthesia facilities at OVC mean to you?

I am very excited to see the new surgery area. From what I know about the space from our planning sessions, it will be an impressive, state-of-the-art facility. Our current operating rooms are becoming very crowded and dated. Because of the increased surgical workload the OVC Companion Animal Hospital has experienced in the past few years, we are often competing for rooms and have to juggle our schedules to ensure that all the cases can be cared for in the best order possible. Although we never compromise on sterility or cleanliness, crowded and busy operating rooms are much more difficult to manage and maintain. Having the new facilities will only improve patient care and experiences for everyone.

A deep, enduring love for dogs has always been a driving force in my life. I hoped and planned to be a veterinarian from a young age, knowing that I would be able to return some of the care and devotion these unique companions so generously share with their people. As a very young girl, I would spend my days loving, grooming and playing with my childhood dogs, Candy, Nugget and Tyffy. When I close my eyes, I can picture each of them listening as I shared my fears, exploring beside me as I learned about our world, and walking with me as I took each step forward. They remain such a big part of memories of my childhood home. I will always be grateful to my parents for enriching my life with canine family members and for encouraging my love and concern for all animals.

Not long ago, I learned of the term “Heart Dog”. Just writing those two words brings warm tears of happy memories to my eyes. If you aren’t familiar with this saying, you may have heard these very special pets referred to as “canine soul mates” or “once in a lifetime dogs”. For each person who has known and loved a “Heart Dog”, a different set of circumstances, personal needs and canine characteristics were uniquely combined to produce this special bond.

I have been fortunate enough to walk some of my steps in this life with a “Heart Dog” by my side. My “Heart Dog” was a Flat-Coated Retriever named Lyvie and she helped me shape the person and the veterinarian I am today. Soon after graduation from veterinary school, I had been recently divorced and was living on my own for the first time in my life. The day my Lyvie came home was one of the best days of my life.

Family with generosity and joy. Lyvie was there when I was sick, when I was tired and when I was sad. She celebrated with me when we purchased our veterinary practice and loved her frequent visits with the team at Ajax Animal Hospital. My dog cuddled with me when I mourned the loss of my patients and ensured that I got up to start each day, even when it was difficult.

After many years, my playful, shining black puppy started to get some grey hairs. Our 12-year-old Lyvie was a patient tutor, sharing her body with me as I learned new techniques to improve mobility and relieve osteoarthritic pain. As the time to travel and leave home for the in-class component of my course grew near, I was worried about being away from her for two weeks. One morning, soon before I was to depart for my course, Lyvie didn’t get up to greet me in the morning. She said, “no, thank you” to a cookie for the first time in her life. My vet told me that something was wrong. X-rays revealed cancer in Lyvie’s lungs. We brought her home, slept together one more time, and in the early hours of the next morning, my friend Dr. Trace MacKay, helped us to let her go. She died in my arms, hearing her family tell her how loved she was and how cherished she will always be.

In his book “Peter Pan”, J.M. Barrie said, “Never say goodbye because goodbye means going away and going away means forgetting”. So, I didn’t say goodbye to my sweet Lyvie-girl. I thanked her for loving me and hoped that my “Peter Pan Heart Dog” took the “second star to the right and, straight on ‘til morning” to find her way back to me. I will not say goodbye to my beautiful “Heart Dog” as I cannot help my patients and they will forever be a very special piece of my heart.

SAYING GOODBYE

A Piece of My Heart

By Dr. Karyn Jones
DVM, CCRT, OVC Class of 2001

Photo credit: Noel Moens (left), Jane Dawkins, Lyvie (right), Karyn Jones.
In June of 1991, I was admitted to a community hospital, for what had been described to me as a routine surgery. Unfortunately, the word “routine” quickly lost its literal meaning, as I developed a number of complications. My weekend in the hospital, turned into two weeks, as I knew it was tucked away in my “memory file.” It was a brand new world, a world that I had to learn to participate in one step at a time. In the spring of 1995, Tommy and I brought a golden bundle of fluff into our home and hearts. His registered name was Teacupset Smiling Blues Sky, and we had a lot of learning to do. Everyone is familiar with the saying that as one door closes another opens. Blues allowed me to step over the first threshold, and from that day on, we opened many doors together, whether with a scrotum, waker, or cane.

Each of us has been touched by cancer. We can try to run and hide, but inevitably, its evil grip will cross the threshold of our homes. It crested ours in the summer of 2000 and changed our lives forever. On March 27th, 2001, our beautiful blues lost his battle with lymphoma. I cried until there were no more tears to shed, and then I cried again. It has a way to walk us across Canada, it’s about the “sasha and the saulties” calendars, fund training and obedience workshops, agility trials, Tri-Mark Canine Services photo days, special olympics and wellness games. Bucket lists, and so much more. It is about big and little ideas, dimes and nickels, loonies and toonies, and knowing that every single person matters exactly where it needs to go, supporting OVC’s quest to find more and better ways to deal with the disease of cancer in companion animals, and those dedicated to understand and deal with it. OVC is a leader in veterinary health care, learning and discovery for the health of all species, including our own.

OVC Pet Trust

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Dear OVC Pet Trust,

Thank you for the letters we received to acknowledge the donations made by family and friends to honour our best friend Niska. Niska was a classic Hines 57 that we adopted from a farm when she was around five months old. When we arrived at the farm, a medium-sized canine with the longest ears and tail we had ever seen was sprinting toward us. We brought her home, she grew into her ears and tail, and she transitioned from a daily life of cow herding to long walks at Riverside Park and Stanley Hill in Guelph. She never gave up her herding instinct, though, and was keen to make sure her pack stayed together during family walks.

Niska loved long car rides and she faithfully put up with years of weekend travel for softball and hockey tournaments. Always, a sucker for the food on the head and the scratch under the chin, being doted on by my teammates sweetened those adventures.

I felt guilty when I “left” home and Niska for university, living 15 minutes away in residence at the University of Guelph. It was while I was a Greshorn that I first got bit by the research bug as a student in Dr. Gordon Kirby’s lab at the Ontario Veterinary College, igniting a lifelong passion for biomedical research. While my work is focused on human health, research initiatives supported by OVC Pet Trust play a dual role: improving the lives of companion animals in turn supports the mental and physical well-being of their families. I left Niska twice more, eventually moving to Hamilton and then Toronto to pursue graduate studies. Thankfully, she forgave me each time, always greeting me warmly at the front door when I’d come home for a visit. With her gentle and calm demeanor, Niska helped my niece and nephew overcome their fear of dogs, creating many warm memories for them as well.

We all miss her dearly, especially my dad who showed her a level of compassion and care that we all would be fortunate to receive in our last months. We think of her every day and cherish the 17 wonderful years of companionship she gave us.

Sincerely,

Meghan Chenoweth & Family
Guelph and Toronto, Ontario

To share your “In Memory” story, please email OVC Pet Trust’s Writer, Ashleigh Martin, at amarty01@uoguelph.ca.

Now Available OVC Pet Trust: Preparing for the Loss of a Pet

Making end-of-life decisions for your pet is one of the most difficult, challenging and emotional situations a pet owner may face over the lifetime of their beloved companion. Dealing with the loss of a pet can be stressful and, in some cases, extremely emotional and difficult to navigate. It may begin with receiving bad news or a life-limiting medical diagnosis from your veterinarian, or perhaps your pet is aging, and their quality of life is declining, or it could be sudden with not much time to prepare at all. OVC Pet Trust’s new resource may be able to help.

Pet loss support guides for pet owners available in this series:

OVC Pet Trust: Preparing for the Loss of a Pet and OVC Pet Trust: Coping with the Loss of a Pet

www.pettrust.ca

Ask your veterinarian for your FREE copy or visit our website: www.pettrust.ca/petlossresources
UPCOMING VETERINARY INDUSTRY EVENTS


CONGRATULATIONS
Congratulations to our OVC Pet Trust Best Friends Reader Survey winner, Nancy B. from Whitehorse, YT. Thank you to all who took part!

www.pettrust.ca