Long-term clinical control of feline pancreatic carcinoma with toceranib phosphate

Acute cerebrovascular event in a dog with polycythemia vera

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A retrospective analysis of feedlot morbidity and mortality outcomes in calves born to dams with known viral vaccination history

A longitudinal study describing horse demographics and movements during a competition season in Ontario, Canada

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The cover photo for the June 2018 issue was not a Shutterstock image as indicated. It was taken by Vanessa Amey from Napanee, Ontario; and her dog is Bruno.
President’s Message
Le mot de la présidente

Breaking out of the shy silo
Sortir de sa coquille

As I sit down to write my last president’s message I can’t help but look back on my career. As a painfully shy child my parents encouraged me to become engaged by volunteering. They led by example. I started volunteering with the Red Cross in elementary school; as time passed and I became a veterinarian I saw the opportunity to become involved in my profession in other ways besides practicing. I volunteered to become a member at large for my provincial veterinary medical association. This led to the opportunity to become a part of the Canadian Veterinary Medical Association (CVMA), not only as a member, but to volunteer and serve my province on council, then executive, and finally as president this past year.

This position has given me an entirely different perspective on the veterinary profession. Instead of focusing on practicing in my little “silo” in my province it has made me acutely aware of worldwide matters and the need for international veterinary collaboration and a global approach.

The global economy dictates what happens with food security and safety, animal welfare, agricultural trade, disease prevention and control, and the availability of veterinary biologics. Which brings me to my main point — why be a member of the Canadian Veterinary Medical Association? I believe the veterinary profession needs a national voice so veterinarians can maintain involvement in matters that affect the profession — otherwise someone else will get to make regulatory and policy decisions on our behalf.

The CVMA is not a regulatory body you may point out; that is correct, it is not. The CVMA was established and federally incorporated by an act of parliament in 1948 (70 years ago this year). The CVMA lobbies the federal government to move forward with regulatory and policy changes to improve antimicrobial stewardship, preserve the profession’s right to extra-label drug use and use of compounded drugs, and advocates for the timely approval of veterinary drugs for food-producing and companion animals. The CVMA advocates on the veterinarian-

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L’usage du présent article se limite à un seul exemplaire pour étude personnelle. Les personnes intéressées à se procurer des réimpressions devraient communiquer avec le bureau de l’ACMV (hbroughton@cvma-acmv.org) pour obtenir des exemplaires additionnels ou la permission d’utiliser cet article ailleurs.
ian’s behalf to improve animal cruelty legislation and provides veterinary input in the development of national codes of practice for the care and handling of animals.

The CVMA is fully owned by its members. It is governed by elected/appointed individuals from each province, representatives from the 5 vet colleges, a representative of the Students of the CVMA, and a non-voting representative from the Registered Veterinary Technicians and Technologists of Canada.

Members are invited to engage in many ways, for example, by providing input into position statements and the development of codes of practice. There are over 600 volunteers, most of whom are veterinarians, who provide their services to the CVMA. The Association tries to assist veterinarians in practice to provide for animal health, to promote their well-being, and to ensure the profession contributes to public and environmental health.

Why is membership important? Speaking on behalf of the profession requires membership numbers that speak to credibility. Without credibility we have no effective voice.

Without a voice “others” will be making decisions on veterinarians’ behalf.

Without members — there may be no CVJ or C/VJR. Were you aware that the CVMA is the only publisher of peer-reviewed science articles in Canada?

Without members who will speak to national and international issues and animal welfare? Who will represent and advocate on behalf of veterinarians and provide guidelines and tools for veterinarians to improve animal health, public health and ecosystem health? Think about that. No man or woman is an island. What the CVMA does impacts the profession nationally and globally.

Am I proud to be a member of the CANADIAN Veterinary Medical Association? You bet I am! I am proud to be from Canada, to be part of this wonderful profession, and to be part of the bigger picture of this profession, to sit at the table with many international associations, species groups, industry, and government.

I can tell you the CVMA is highly respected nationally and internationally; I am proud of this fact. This is my profession. I want my national organization to be at the table with many international associations, species groups, industry, and government.

I want my national organization to be at the table with many international associations, species groups, industry, and government.

I can tell you the CVMA is highly respected nationally and internationally; I am proud of this fact. This is my profession. I want my national organization to be at the table with many partners and involved in many important discussions. I think all too often in our busy day-to-day life and silos that we don’t think of the bigger picture. Do you want to lose the right to prescribe? Do you want a voice in the humane transportation of animals, etc? If the answer is yes then being a member of the CVMA is important. As someone once said “if you aren’t at the table, you may be on the menu.”

So, with that, I bid you farewell as your president. I have been very proud and humbled to represent Canada’s veterinarians nationally and internationally. It has been a wonderful experience. Thank you to the Nova Scotia Veterinary Medical Association and the Canadian Veterinary Medical Association for giving this shy gal from Cape Breton Island the opportunity to represent her province, her country, and her profession nationally and internationally. It has been my extreme pleasure and honor.

Troye McPherson

Parlement en 1948 (il y a 70 ans cette année). L’ACMV exerce des pressions auprès du gouvernement fédéral pour aller de l’avant et mettre en œuvre des modifications réglementaires et politiques en vue d’améliorer l’antibigouvernance, de préserver le droit de la profession à l’utilisation des médicaments en dérogation des directives de l’étiquette ainsi que le recours aux préparations magistrales et de faire valoir l’approbation rapide des médicaments vétérinaires pour les animaux destinés à l’alimentation et les animaux de compagnie. L’ACMV travaille au nom des vétérinaires afin d’améliorer les lois sur la cruauté envers les animaux et elle fournit de la rétroaction lors de l’élaboration des codes de pratiques nationaux pour le soin et la manipulation des animaux.

L’ACMV appartient entièrement à ses membres. Elle est régie par des personnes élues ou nommées provenant de chaque province, des représentants des cinq écoles de médecine vétérinaire, un représentant des Étudiants de l’ACMV et un membre non votant de Technologues et techniciens vétérinaires agréés du Canada.

Les membres sont invités à participer de nombreuses façons, par exemple, en fournissant des commentaires sur les énoncés de position et l’élaboration des codes de pratiques. Il y a plus de 600 bénévoles, dont la plupart sont des vétérinaires, qui fournissent leurs services à l’ACMV. L’Association travaille en vue d’appuyer les vétérinaires dans l’exercice de la profession afin qu’ils puissent protéger la santé animale, promouvoir leur bien-être et veiller à ce que la profession contribue à la santé publique et environnementale.

Pourquoi l’adhésion est-elle importante? Le porte-parole de la profession doit avoir un effectif qui lui accorde de la crédibilité. Sans crédibilité, nous n’avons pas de voix efficace.

Sans une voix, les «autres» prendront des décisions au nom des vétérinaires.

Sans membres — il pourrait ne plus y avoir La RVC ou la RCRV. Savez-vous que l’ACMV est le seul éditeur d’articles scientifiques évalués par les pairs au Canada?

Sans membres, qui parlera à propos des enjeux nationaux et internationaux et abordera les enjeux liés au bien-être animal? Qui représentera et défendra les vétérinaires et offrira des lignes directrices et des outils aux vétérinaires afin d’améliorer la santé animale, la santé publique et la santé des écosystèmes? Il est important de réfléchir à cette question. Aucun homme ou femme n’est une île. Les activités de l’ACMV ont un impact sur la profession à l’échelle nationale et mondiale.

Suis-je fière d’être membre de l’Association CANADIENNE des médecins vétérinaires? Absolument! Je suis fière d’être canadienne, de faire partie de cette merveilleuse profession et de participer à l’organisation nationale de cette profession, de prendre place à la table avec une foule d’associations internationales, de groupes d’espèces, de membres de l’industrie et de représentants du gouvernement.

Je peux vous dire que l’ACMV est une organisation hautement respectée à l’échelle nationale et internationale et j’en suis fière. C’est ma profession. Je désire que mon organisation nationale soit à la table avec beaucoup de partenaires et qu’elle participe à de nombreuses discussions importantes. Je crois que trop souvent dans notre vie quotidienne chargée qui se déroule...
en silos, nous ne pensons pas à la situation dans son ensemble. Voulez-vous perdre le droit de prescription? Désirez-vous avoir voix au chapitre sur le transport sans cruauté des animaux, etc.? Si la réponse est oui, alors il est important d’être membre de l’ACMV. Comme quelqu’un l’a déjà dit : «Si vous n’êtes pas à la table, vous pourriez être au menu.»

Donc, avec ces mots, je vous fais mes adieux en tant que votre présidente. J’ai représenté les vétérinaires du Canada à l’échelle nationale et internationale avec fierté et humilité.


_Troye McPherson_
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Ethical question of the month — July 2018

Fur farming has unique welfare challenges. Among these is timely and effective euthanasia of individual animals suffering from injuries or disease from which recovery is unlikely. A captive bolt gun is a safe and effective method of euthanasia for traditional domestic species. However, farmed mink and foxes are difficult to restrain adequately (particularly mature individuals) to ensure proper placement of the gun. Efforts to humanely restrain farmed fur animals for euthanasia often result in additional stress and injuries to the animal and the caretaker. If a safe, practical, and humane means of euthanasia does not exist, is it acceptable to allow farmed fur animals to die naturally? Is there an alternative for today’s fur farmer?

Les réponses au cas présenté sont les bienvenues. Veuillez limiter votre réponse à environ 50 mots et nous la faire parvenir par la poste avec vos nom et adresse à l’adresse suivante : Choix déontologiques, a/s du Dr Tim Blackwell, 6486, E. Garafraxa, Townline, Belwood (Ontario) N0B 1J0; téléphone : (519) 846-3413; télécopieur : (519) 846-8178; courriel : tim.e.blackwell@gmail.com
Les propositions de questions déontologiques sont toujours bienvenues! Toutes les questions et situations présentées dans cette chronique s’inspirent d’événements réels dont nous modifions certains éléments, comme les noms, les endroits ou les espèces, pour protéger l’anonymat des personnes en cause.
Ethical question of the month — April 2018

A dairy client has purchased a new system for raising suckling calves with an automatic milk feeding machine. There are design components of this group housing system that are worrisome but the client assures you that the salesman knows all about how to raise calves in this set-up. You are taken aback when you are told the cost. Group housing is considered more welfare friendly than individual calf hutches, so you are pleased in this regard. It is not long, however, before calves are showing signs of severe respiratory disease. You suspect the design of the new housing/feeding system is at fault but the owner is reluctant to accept any suggestions about changes because of the large investment he has made. Despite your best efforts to have changes made, your client prefers to routinely use prophylactic antibiotics to control the respiratory disease. He says that not to use routine antibiotics on each calf is a welfare issue. With the increased emphasis on antimicrobial stewardship, you feel you are going backwards in terms of prudent use practices to use antibiotics to overcome poor management decisions. How do you balance your responsibility to decrease the development of antimicrobial resistance with your responsibility to protect the health and welfare of these calves?

Question de déontologie du mois — Avril 2018

Un client laitier a acheté un nouveau système d’élevage des veaux au pis doté d’un nourrisseur-allaiteur. Il y a des éléments de conception du système de logement en groupe qui sont inquiétants mais le client vous assure que le vendeur est bien renseigné sur la façon d’élever des veaux dans cette installation. Vous êtes surpris lorsqu’il vous informe du prix. Le logement en groupe est considéré comme étant plus convivial pour le bien-être que les huches à veaux individuelles et vous êtes donc heureux à cet égard. Cependant, peu de temps après, les veaux manifestent des symptômes sérieux de maladie respiratoire. Vous soupçonnez que la conception de ce nouveau système de logement et d’alimentation est en cause mais le propriétaire manifeste de la réticence à accepter les modifications suggérées en raison des investissements importants. Malgré vos meilleurs efforts pour apporter des changements, votre client préfère l’utilisation régulière d’antibiotiques prophylactiques afin de contrôler les maladies respiratoires. Il dit que l’utilisation régulière des antibiotiques représente un enjeu de bien-être. Dans le contexte de l’importance grandissante de l’antibiogouvernance, vous estimez que vous effectuez un pas en arrière dans vos efforts de promotion de l’utilisation prudente des antibiotiques lorsque vous utilisez des antibiotiques pour compenser les mauvaises décisions de gestion. Comment pouvez-vous parvenir à un équilibre entre votre responsabilité de réduction du développement de la résistance aux antimicrobiens et votre responsabilité de protection de la santé et du bien-être de ces veaux?

Client using antibiotics to compensate for a pathogenic system — A comment

Group housing and automatic feeding systems can raise calves with low pneumonia rates if certain management practices and ventilation principles are strictly adhered to. These are inexpensive relative to drug cost and sick calves. Dairy veterinarians must acquire the knowledge and communication skills (them- selves or through others) to convince the producer to implement the necessary changes. This is not a mutually exclusive scenario.

Dr. Frank Schenkels, Shubenacadie, Nova Scotia

An ethicist’s commentary on a client using antibiotics to compensate for a pathogenic system

Anyone with an iota of historical perspective will realize that the current case is a classic example of history repeating itself. It is precisely an instance of how agriculture lost the system of husbandry in order to increase productivity by relying on technology. Agriculture today is suffering mightily from the exchange of husbandry and stewardship for technological sand- ers, allowing us to force square pegs into round holes at the expense of animal health, well-being, environmental despoliation, and the multiplicity of other problems which have arisen in industrial agriculture.

Indeed, the situation described is precisely how agriculture came to overuse antibiotics to the detriment of human and ani- mal health, and has incurred the wrath of society. As I have often remarked in this column, antibiotics are no way to shore up or compensate for pathogenic systems for maintaining animals. Yet this is precisely what the client is doing in this situation. We have also frequently discussed the moral obligations one incurs when entering the veterinary profession. Following Plato, I have argued that the primary obligation of a veterinarian is to the animals; i.e., to improve that upon which veterinarians exercise their art and science. That is not, however, the only obligation a veterinarian has. He or she is certainly obligated to the client who hires a veterinarian, and pays the bill. But there is nothing in this obligation that overrides the primary obligation...
to the health of the animal, just as a physician should never do anything detrimental to a child’s health, even if, in some bizarre way, the parents profit from it.

Additionally, veterinarians have obligations to society in general. And society across the world has made clear its distaste for an opposition to the overuse of antimicrobials, in virtue of the threat such a practice poses to the management of disease by virtue of engendering antibiotic resistance. Therefore, plainly, acquiescence to the client’s wishes places the veterinarian squarely in conflict with the society in which he or she lives and which charters the profession that he or she expects to serve as a guardian of human and animal health. In today’s world, being seen as a purveyor of antibiotics is a professional kiss of death.

A fourth obligation possessed by veterinarians and indeed by any professional is to themselves. One simply cannot practice without making a living. But there are restrictions and constraints upon what one can do to remain economically solvent. Physicians cannot simply write prescriptions, for example for opiates, to those willing to pay them to do so. That would be a classic abrogation of one’s professional responsibilities and would essentially be a paradigmatic instance of malpractice. In the same way, writing prescriptions to maintain a system that makes the animals sick is equally an abrogation of professional responsibility.

The fact that your client has been sold a bill of goods by an unscrupulous salesman is unfortunate, but not your responsibility to rectify. The entire situation is reminiscent of a sign that my secretary kept on her desk that read: “irresponsibility on your part does not constitute an emergency on mine.” By all means, the veterinarian should do everything possible to help the client recover from his or her error, but that does not include violating one’s moral principles and moral obligations.

_Bernard E. Rollin, PhD_
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1. Which of the following is NOT recommended for the treatment of chronic diarrhea?
A. Antidiarrheal drugs (such as loperamide)
B. Novel protein diets
C. Corticosteroids
D. Fenbendazole

2. Superficial necrolytic dermatitis may be associated with all EXCEPT which of the following?
A. Anticonvulsant drugs
B. Glucocorticoids
C. Mycotoxins
D. Glucagon-producing tumors

3. A 5-year-old Quarter horse has hematuria at the end of urination, which has continued for 5 days. Which of the following structures is most likely to be affected?
A. Distal urethra
B. Kidneys
C. Ureters
D. Bladder
E. Proximal urethra or bladder neck

4. An owner calls because her 6-year-old blue and gold macaw recently flew into a window and is now bleeding from a wing. The bird is apparently in great deal of pain and will not let the owner look at the wing. They are on their way to the clinic and will be there in 10 minutes. Which of the following diagnoses should be immediately considered?
A. Closed fracture of the carpometacarpus
B. Open fracture of the radius
C. Broken blood feather
D. Open fracture of the tibiotarsus
E. B and C

1. Lequel des choix suivants N’EST PAS recommandé pour le traitement de la diarrhée chronique?
A. médicaments antidiarrhéiques (tel le lopéramide);
B. nouvelles diètes protéiniques;
C. corticostéroïdes;
D. fenbendazole.

2. Lequel des choix suivants N’EST PAS associé à la dermatite nécrolytique superficielle?
A. anticonvulsivants;
B. glucocorticoides;
C. mycotoxines;
D. tumeurs produisant du glucagon.

3. Un Quarter horse âgé de 5 ans présente de l’hématurie à la fin de la miction depuis 5 jours. Laquelle des structures suivantes est la plus susceptible d’être atteinte?
A. portion distale de l’urètre;
B. reins;
C. uretères;
D. vessie;
E. portion proximale de l’urètre et col de la vessie.

4. Le propriétaire d’un ara bleu et jaune âgé de 6 ans téléphone parce que son oiseau est récemment entré en collision avec une fenêtre et que, actuellement, l’une de ses ailes saigne. L’oiseau est apparentemment en grande douleur et ne laisse pas le propriétaire le toucher. Ils seront tous les deux à la clinique dans 10 minutes. Lequel des diagnostics suivants doit-on immédiatement considérer?
A. fracture fermée du carpo-métacarpien;
B. fracture ouverte du radius;
C. plume de sang brisée;
D. fracture ouverte du tarso-métatarsien;
E. B et C.

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5. Infectious pododermatitis (foot rot) is diagnosed in a group of replacement Hereford heifers. Which of the following is an appropriate therapy, based on the etiology of this condition?
A. Administer C. perfringens antitoxin.
B. All affected feet should be cleaned, dried, and a topical antifungal applied.
C. Treat with a cephalosporin approved for use in cattle.
D. Heifers should be treated with high doses of dexamethasone.
E. Treat with injectable selenium.

5. On diagnostique une pododermatite infectieuse (piétin) dans un groupe de génisses Hereford de remplacement. Lequel des traitements suivants est approprié selon l’étiologie de cette affection?
A. administrer l’antitoxine de C. perfringens;
B. nettoyer, assécher et appliquer un antifongique topique aux quatre pieds;
C. traiter à la céphalosporine homologuée pour usage chez les bovins;
D. traiter les génisses avec des doses élevées de dexaméthasone;
E. traiter au sélénium injectable.

Questions and answers were derived from Review Questions and Answers for Veterinary Boards 2nd ed., a 5-volume series including Basic Sciences, Clinical Sciences, Small Animal Medicine and Surgery, Large Animal Medicine and Surgery, and Ancillary Topics, by kind permission of the publisher, Mosby–Year Book, Inc., St. Louis, Missouri.


JOIN THE CANADIAN VETERINARY RESERVE TODAY!

A PROGRAM OF THE CANADIAN VETERINARY MEDICAL ASSOCIATION

The Canadian Veterinary Reserve (CVR), a national body of Canadian veterinarians, provides veterinary surge capacity to first responders in large scale animal disease emergencies and other disasters affecting animal health and welfare. CVR members choose where and when they serve and are fairly remunerated for their service.

Go to bit.ly/JoinCVR and add your name to the roster of over 200 members.

Questions? reserve@cvma-acmv.org
New Canadian Veterinary Oath

The Canadian Veterinary Medical Association (CVMA) is pleased to share its revised Canadian Veterinary Oath (2018).

The updated version of the Oath is not substantively different from the 2004 version, with a few exceptions. The role in animal suffering has been expanded, recognizing the role of the veterinary profession in animal welfare. “Practice my profession” has been amended to “perform my professional duties,” which is believed to be more inclusive of the obligations. The name has been adapted to “The Canadian Veterinary Oath” rather than the “Veterinarian’s Oath,” allowing it to be used in a wider context, including that of the registered veterinary technician and technologist; widely accepted to be members of the veterinary profession.

The Oath has been commonly used at convocation ceremonies at Canadian veterinary schools, and the Association is happy to be part of the process of seeing this tradition continue.

The CVMA would like to thank Drs. Karol Mathews, Karen Machin and Duane Landals for their contribution to the development of the revised version of the Canadian Veterinary Oath.

The Canadian Veterinary Oath

“As a member of the veterinary medical profession, I solemnly swear that I will use my scientific knowledge and skills for the benefit of society.

I will strive to:
• promote animal health and welfare,
• prevent and relieve animal suffering,
• protect the health of the public and the environment, and
• advance comparative medical knowledge.

I will perform my professional duties conscientiously, with dignity, and in keeping with the principles of veterinary medical ethics.

I will strive continuously to improve my professional knowledge and competence, and to maintain the highest professional and ethical standards for myself and the profession.”

— CVMA 2004 — revised 2018

Serment vétérinaire canadien

“En tant que membre de la profession médicale vétérinaire, j’affirme solennellement que je mettrai mes connaissances et mes compétences scientifiques au service de la société.

Je m’efforcerai de :
• promouvoir la santé et le bien-être des animaux;
• prévenir et soulager la souffrance des animaux;
• protéger la santé du public et de l’environnement;
• faire progresser les connaissances médicales comparées.

J’exercerai mes fonctions professionnelles consciencieusement, avec dignité et conformément aux principes de déontologie de la médecine vétérinaire.

Je m’efforcerai sans cesse d’améliorer mes connaissances et mes compétences professionnelles et de respecter les normes professionnelles et déontologiques les plus rigoureuses à mon égard et à celui de la profession.”

— Association canadienne des médecins vétérinaire 2004 — révisé en 2018
Saskatchewan Veterinarian Appointed 70th President of the Canadian Veterinary Medical Association

Dr./Dre Terri Chotowetz

The Canadian Veterinary Medical Association (CVMA) is delighted to welcome Dr. Terri Chotowetz as its new president.

Dr. Chotowetz graduated from the Western College of Veterinary Medicine in 1990. She practiced in Alberta from 1990 to 1998 in several mixed animal practices before returning to Saskatchewan in 1998. Dr. Chotowetz returned to work in 2000 at a companion animal clinic in Saskatoon and has been there for 18 years.

She was elected to the Saskatchewan Veterinary Medical Association (SVMA) in 2009 and went on to serve as president from 2011 to 2012. She was a member of the SVMA Animal Welfare Committee for 9 years and served on the Board of Directors for the Animal Protection Services of Saskatchewan for 3 years.

Dr. Chotowetz became the Saskatchewan representative on the CVMA Council in 2013. While on Council she served as the liaison for the Animal Welfare Committee and the Canadian Veterinary Reserve, and is the CVMA representative on the Western College of Veterinary Medicine Advisory Council.

“I feel privileged to be named the 70th president of the Canadian Veterinary Medical Association,” says Dr. Chotowetz. “I have been involved with the CVMA for 5 years and I look forward to leading the CVMA in its mission to be the national and international voice for Canada’s veterinarians, providing leadership and advocacy for veterinary medicine.”

In her spare time, Dr. Chotowetz enjoys spending time with her husband and family at their acreage outside Saskatoon. They have 4 very spoiled dogs and a cat that keep them busy and happy. Her favorite, and only, hobby is reading which is made even better with a cup of coffee and a lap full of dogs.

Dr. Chotowetz will serve on the CVMA Council from July 2018 until July 2019. The CVMA would like to take this opportunity to thank Dr. Troye McPherson for her dedication and enthusiasm while serving as president for the past year.

Dr./Dre Terri Chotowetz
Employee Benefits Program – A Powerful Strategic Recruitment and Retention Tool

Programme d’avantages sociaux des employés – Un puissant outil de recrutement stratégique et de rétention

As a practice owner and employer, there are many good reasons to offer employee benefits. It can make your practice more competitive, attract top talent, retain good employees, and maintain productivity. When you offer a group benefits package to your employees, you’re offering security for themselves and their family in the form of financial and medical coverage.

The Canadian Veterinary Medical Association (CVMA), in partnership with Western Financial Group Insurance Solutions, is proud to offer its members access to a unique and exclusive Employee Benefits Program. We understand that in today’s competitive job market, having a dependable and affordable employee benefits program is critical to attracting and retaining quality employees.

How the CVMA program differs from others

The CVMA Employee Benefits Program provides comprehensive life, health and dental coverage to clinics across Canada. The program is unique and economically superior to traditional methods of purchasing employee benefits coverage. It offers CVMA members the opportunity to reduce their annual premium by up to 10% and maintain stability that cannot be established in other programs.

When selecting an employee benefits program, it’s critical to understand the potential risk you and your staff are exposed to each year at renewal time. The majority of insurance programs renew plans annually based on the individual claims experience of the business. This creates a frustrating situation for many small business owners and employees, as they are not able to budget for the ongoing costs of their plan. As a result, veterinary practices are faced with the risk of substantial rate increases at renewal or reductions of coverage to maintain plan affordability.

To address the lack of predictability in a plan, the CVMA program provides veterinary clinics with strength in numbers and spread of risk by being pooled with over 1600 other organizations across Canada. The claims of the pooled group, consisting of over 20,000 employees, are far more predictable than the claims of a single business. In addition, the large premium volume of the group easily offsets large claims that any individual clinic may incur.

À titre de propriétaire de pratique et d’employeur, il y a une foule de bonnes raisons d’offrir des avantages sociaux aux employés. Cela peut rendre votre pratique plus concurrentielle, attirer des employés talentueux, retenir les services des bons employés et maintenir la productivité. Lorsque vous offrez un forfait d’avantages sociaux de groupe à vos employés, vous leur offrez de la sécurité pour eux-mêmes et leur famille sous forme d’une protection financière et médicale.

L’Association canadienne des médecins vétérinaires (ACMV), en partenariat avec HED Courtier en assurance Inc. (HED), est fière d’offrir à ses membres l’accès à un Programme d’avantages sociaux unique et exclusif. Nous comprenons que, dans le marché concurrentiel de l’emploi d’aujourd’hui, il est essentiel d’avoir un programme d’avantages sociaux qui est fiable et abordable afin d’attirer et de conserver des employés de qualité.

Comment le programme de l’ACMV se démarque des autres programmes

Le Programme des avantages sociaux pour les employés de l’ACMV offre aux cliniques à l’échelle du Canada une protection complète en matière d’assurance vie, d’assurance médicale et dentaire. Le programme est unique et supérieur sur le plan financier aux méthodes traditionnelles d’achat d’une couverture d’avantages sociaux. Il offre aux membres de l’ACMV la possibilité de réduire leur prime annuelle jusqu’à 10 % et de maintenir une stabilité qui ne peut pas être établie dans d’autres programmes.

Lors du choix d’un programme d’avantages sociaux, il est essentiel de comprendre le risque potentiel auquel vous et vos employés êtes exposés chaque année au moment du renouvellement. La majorité des programmes d’assurance procède au renouvellement annuel des régimes en fonction de l’historique des réclamations de l’entreprise, ce qui donne lieu à une situation frustrante pour beaucoup de propriétaires et d’employés de petites entreprises, car ils ne peuvent pas budgétiser pour les coûts de maintien de leur régime. Par conséquent, les pratiques vétérinaires s’exposent au risque de hausses substantielles des tarifs au moment du renouvellement ou à des réductions de la protection afin de préserver l’abordabilité du régime.

Pour gérer l’absence de prévisibilité d’un régime, le programme de l’ACMV offre aux cliniques vétérinaires la force du nombre et répartit le risque grâce à un regroupement avec plus de 1600 autres organisations au Canada. Les réclamations de ce groupe, qui représente plus de 20 000 employés, sont beaucoup plus prévisibles que celles d’une seule entreprise. De plus, le volume important de primes du groupe permet de facilement compenser les réclamations élevées qui peuvent être présentées par une clinique individuelle.

Les cliniques membres ont la capacité de créer un régime sur mesure afin de répondre aux besoins spécifiques de leurs employés. Le programme de l’ACMV offre un éventail d’options pour les soins dentaires, l’assurance maladie complémentaire,
Member clinics have the ability to create a customized plan to meet the unique needs of their staff. The CVMA program provides a range of options for dental, extended health, life insurance, critical illness, short and long-term disability coverage, as well as employee assistance plans and health care spending accounts. With ongoing service support and the use of online administration, you can easily add new employees, update employee information, download forms and print electronic booklets. All plan members receive a pay direct drug card, access to an online claim submission portal and direct deposit for efficient claims processing.

Employee benefits are an important part of the total compensation package, and your employees are your greatest asset. So why not stand out from your competitors and bring health and wellness into your practice by offering an Employee Benefits Plan?

To learn more about the CVMA Employee Benefits Program and how you can save money for your business, contact Western Financial Group Insurance Solutions at 1-866-860-2862 or visit (www.cvmainsurance.com).

CVMA Web Store Program — MyVetStore.ca

Introducing the Pet Food Manufacturer’s Rebate Program

Programme de vitrine Web de l’ACMV — MaVitrineVeterinaire.ca

Lancement du programme de remise des fabricants d’aliments pour animaux de compagnie

A new Pet Food Manufacturer’s Rebate Program has been introduced, which provides an instant rebate on your clients’ pet food purchases ordered through the Web Store’s AutoOrder feature.

The CVMA Web Store — MyVetStore.ca is a customizable online retail platform branded to your practice, offering your clients the ease and convenience of purchasing their pet’s prescription products and pet foods directly from you. One of the great features of the Web Store is Automatic Ordering (AutoOrder) from which pet foods and other authorized products can be shipped to either the client’s home or the clinic for pick-up.

Pet food sales is an important revenue source for veterinary hospitals, and by offering the convenience and flexibility of online shopping, regular food delivery, preferred delivery locations, and the incentive of a manufacturer’s rebate on pet food AutoOrders, your clients don’t have a reason to buy their pet food elsewhere. The Web Store can help promote better dietary compliance, while increasing practice profitability without the cost and hassle of stocking inventory.

Un nouveau programme de remise des fabricants d’aliments pour animaux de compagnie a été introduit et il offre une remise instantanée sur les aliments pour animaux commandés par vos clients à l’aide de la fonction d’Autoapprovisionnement de la vitrine en ligne.

La vitrine en ligne de l’ACMV — MaVitrineVeterinaire.caMD est une plate-forme en ligne de commerce au détail qui peut être personnalisée pour votre clinique afin d’offrir à vos clients la commodité d’acheter facilement les produits sur ordonnance et les nourritures thérapeutiques directement auprès de votre clinique. L’une des fonctions intéressantes de MaVitrineVétérinaire est l’approvisionnement automatique (Autoapprovisionnement) qui permet d’acheter des aliments pour animaux et d’autres produits autorisés pour livraison directement au domicile du client ou à la clinique pour une cueillette ultérieure.

Les ventes d’aliments pour animaux de compagnie représentent une source de revenus importante pour les cliniques vétérinaires et, en offrant la commodité et la flexibilité des achats en ligne, une livraison régulière d’aliments, des lieux de livraison privilégiés et
What is the Pet Food Manufacturer’s Rebate Program?
The new Pet Food Manufacturer’s Rebate Program allows your clients to benefit from instant rebates from participating manufacturers when an AutoOrder is set up through the CVMA Web Store — MyVetStore.caTM.

How does it work?
Within the management system, you can see which manufacturers participate in the program and the rebate they offer. The rebate is applied immediately to your client’s AutoOrder purchase. Daily, the clinic is funded the manufacturer’s rebate so that you do not need to wait for your refund or submit supporting documents to get the refund. The system manages all that.

What if I already offer an AutoOrder discount?
The manufacturer’s discount will be on top of any AutoOrder discount that you currently offer or want to offer. For example, if you are now offering an AutoOrder discount of 5% and the manufacturer’s rebate is 5%, your client will receive a discount of 10%.

What if I’m offering a unit price discount, or the client receives a discount by virtue of his/her pricing column?
If you are offering someone a pricing discount, the pricing discount will apply first, followed by the AutoOrder discount (if applicable), and then the manufacturer’s rebate will be applied.

How can I learn more information about the CVMA Web Store, the AutoOrder feature, or the Manufacturer’s Rebate Program?
Contact the MyVetStore support line at 1-877-788-5028 or send an e-mail (info@myvetstoresupport@acumenex.com). The CVMA has negotiated the most favorable financial terms for its members (www.canadianveterinarians.net/documents/cost-for-cvma-members-myvetstore).

The CVMA Web Store is configured to meet the respective provincial veterinary regulations and guidelines.

l’incitatif d’une remise du fabricant sur l’Autoapprovisionnement d’aliments pour animaux de compagnie, vos clients n’auront aucune bonne raison d’acheter leurs aliments ailleurs. MaVitrineVétérinaire peut favoriser une meilleure observance alimentaire tout en augmentant la rentabilité sans les coûts et les tracas associés à la gestion d’un inventaire.

En quoi consiste le programme de remise des fabricants d’aliments pour animaux de compagnie?
Le nouveau programme de remise des fabricants d’aliments pour animaux de compagnie permet aux clients de profiter de rabais instantanés offerts par les fabricants participants lorsque la fonction d’Autoapprovisionnement est activée dans la vitrine en ligne de l’ACMV — MaVitrineVétérinaire.ca™.

Comment le programme fonctionne-t-il?
Dans le système de gestion, vous pouvez voir quels fabricants participent au programme et la remise qui est offerte. La remise s’applique ensuite immédiatement à l’achat d’Autoapprovisionnement de votre client. La clinique recevra quotidiennement la remise du fabricant et vous n’aurez pas à attendre votre remboursement ni à soumettre des documents pour recevoir le remboursement. Le système s’occupe de cette gestion.

Et que faire si j’offre déjà un rabais d’Autoapprovisionnement?
Le rabais du fabricant s’ajoutera au rabais d’Autoapprovisionnement que vous offrez déjà ou que vous désirez offrir. Par exemple, si vous offrez maintenant un rabais d’Autoapprovisionnement de 5% et que la remise du fabricant est de 5%, votre client recevra maintenant un rabais de 10%.

Qu’arrivera-t-il si j’offre un rabais sur le prix à l’unité ou si le client reçoit un rabais en raison de la colonne de prix?
Si vous offrez un rabais sur le prix, le rabais sur le prix sera appliqué d’abord, suivi du rabais d’Autoapprovisionnement (le cas échéant) et la remise du fabricant s’appliquera ensuite.

Comment puis-je en apprendre davantage à propos de MaVitrineVétérinaire, de la fonction d’Autoapprovisionnement ou du programme de remise du fabricant?
Contactez la ligne d’assistance de MaVitrineVétérinaire au 1-877-788-5028 ou envoyez un courriel à (info@myvetstoresupport@acumenex.com). L’ACMV a négocié les conditions financières les plus favorables pour ses membres (https://www.veterinairesaucanada.net/documents/cost-for-cvma-members-myvetstore).

MaVitrineVétérinaire de l’ACMV est configurée de façon à respecter les règlements et les directives respectives des organismes de médecins vétérinaires provinciaux.
Meet the 2018–2019 Students of the CVMA (SCVMA) Committee Representatives!

The Students of the Canadian Veterinary Medical Association (SCVMA) Committee consists of one CVMA student representative at each of the 5 Canadian veterinary colleges, strengthening the links between the Association and its student members.

Kate Rundle, SCVMA Committee representative for the Atlantic Veterinary College (AVC), dreamed of becoming a veterinarian since she was a small child. Kate always loved every animal and gained experience with a variety of small, large, and exotic animals throughout her high school and undergraduate years, which cemented her choice to pursue a career in veterinary medicine. Kate completed her undergraduate degree in Biology with a specialization in Life Sciences at the University of Prince Edward Island (UPEI) in 2014 and returned to UPEI in 2015 to add an honors to her degree. After completing her honors degree, Kate spent 7 weeks at a local wildlife rehabilitation centre and fell in love with wildlife medicine. In the fall of 2015, Kate began her Masters of Science (MSc) in AVC’s Department of Biomedical Sciences where she studied the effects of naphthenic acids, a toxicant found in oil sands’ waste water, on mitochondria isolated from fish. Kate presented her research in Orlando, Florida, at the 2016 Society of Environmental Toxicology and Chemistry (SETAC) World Congress and currently has a paper under revision in Environmental Science and Technology, a biweekly peer-reviewed scientific journal. In 2017, Kate’s dream of becoming a veterinarian was realized when she was accepted to AVC. Kate continued writing her thesis throughout her first year of veterinary college and is set to defend her MSc in the next couple of months. Kate is excited for the opportunity to connect with everyone next January at the 2019 SCVMA Symposium, held at la Faculté de médecine vétérinaire in Saint-Hyacinthe, Québec, and to represent Canadian veterinary students on CVMA’s Council as the 2018/19 SCVMA Committee president!

Erica Ward, SCVMA Committee representative for the University of Calgary — Faculty of Veterinary Medicine (UCVM), was born and raised in Calgary; however some of her favorite memories from growing up are from St. Paul, Alberta, where her family farm, with cattle, horses, and many other animals, is located. Envious of her cousins who were 4H, a global youth organization through which her family showed horses and cattle, Erica joined the Calgary club and showed her long-haired guinea pigs for a year. From the age of 6, Erica has also been an active member of the Girl Guides of Canada and continues to volunteer with the CVMA (SCVMA) Committee to represent Canadian veterinary students on CVMA’s Council as the 2018/19 SCVMA Committee president!

Rencontrez les représentants 2018–2019 du Comité des Étudiants de l’ACMV (ÉACMV)!

Le Comité des Étudiants de l’Association canadienne des médecins vétérinaires (ÉACMV) se compose d’un représentant étudiant de l’ACMV dans chacune des cinq écoles de médecine vétérinaire canadiennes et il renforce les liens entre l’Association et ses membres étudiants.

Kate Rundle, représentante du Comité des ÉACMV pour l’Atlantic Veterinary College (AVC), rêve de devenir vétérinaire depuis sa tendre enfance. Kate a toujours adoré tous les animaux et elle a acquis de l’expérience auprés d’un éventail d’animaux qui étaient petits, grands et exotiques pendant ses études à l’école secondaire et de premier cycle universitaire, ce qui a cimenté son choix de poursuivre une carrière en médecine vétérinaire. Kate a obtenu son diplôme de premier cycle en biologie avec spécialisation en sciences de la vie à l’Université de l’Île-du-Prince-Édouard (UPEI) en 2014 et elle est retournée à l’UPEI en 2015 pour ajouter une spécialisation à son diplôme. Après l’achèvement de son diplôme avec spécialisation, Kate a passé sept semaines dans un centre local de réadaptation de la faune et elle s’est découverte une passion pour la médecine de la faune. À l’automne 2015, Kate a entamé sa maîtrise en sciences (M.Sc.) au Département des sciences biomédicales de l’AVC où elle a étudié les effets des acides naphthéniques, une substance toxique qui se retrouve dans les eaux usées des sables bitumineux, sur la mitochondrie isolée de poissons. Kate a présenté sa recherche à Orlando, en Floride, au Congrès mondial 2016 de la Society of Environmental Toxicology and Chemistry (SETAC) et elle a un article qui fait l’objet d’une révision pour publication dans la revue Environmental Science and Technology, une revue scientifique bimensuelle qui est évaluée par les pairs. En 2017, le rêve de Kate de devenir vétérinaire s’est concrétisé lorsqu’elle a été acceptée à l’AVC. Kate a continué de rédigé son mémoire pendant sa première année de médecine vétérinaire et elle défendra sa maîtrise au cours des prochains mois. Kate est emballée à l’idée de rencontrer les autres étudiants en médecine vétérinaire en janvier prochain au Symposium 2019 des ÉACMV qui se déroulera à Saint-Hyacinthe, au Québec, à la Faculté de médecine vétérinaire de l’Université de Montréal, et de représenter les étudiants en médecine vétérinaire canadiens au sein du Conseil de l’ACMV à titre de présidente 2018–2019 des ÉACMV!

Erica Ward, représentante du Comité des ÉACMV de la Faculté de médecine vétérinaire de l’Université de Calgary (UCVM), est née et a grandi à Calgary. Cependant, quelques-uns des souvenirs favoris de son enfance ont été formés à St. Paul, en Alberta, où se trouve la ferme familiale avec du bétail, des chevaux et de nombreux autres animaux. Elle enviait ses cousins qui étaient membres des 4H, une organisation mondiale de jeunes où ses cousins présentaient leurs chevaux et bovins lors de concours, et Erica s’est jointe au club de Calgary où elle a présenté ses cobayes à poil long pendant une année. À partir de l’âge de six ans, Erica a aussi été une membre active des Guides du Canada et elle continue de faire du bénévolat au sein de l’organisation. Erica a passé deux ans à l’Université de l’Alberta à suivre des cours de...
the organization. Erica spent 2 years at the University of Alberta pursuing a BSc in Animal Health where she was twice-elected as president of the pre-vet and Animal Health Club, and spent her summers rehabilitating wildlife at the Alberta Institute for Wildlife Conservation. Since joining the UCVM class of 2020, Erica has become a member of almost every student club and is the vice-president of Events for the newly created Behavior and Training Club. Giving back and being active in the community has always been a driving force in her life and led her to pursue the SCVMA Committee representative position. Erica is looking forward to representing the CVMA at UCVM and being involved in the Association.

Gillian Davies, SCVMA Committee representative for the Western College of Veterinary Medicine (WCVM), was born and raised in Calgary, Alberta, where she learned about the veterinary profession at an early age and spent much time pestering her local veterinarian with questions. After high school, Gillian fled to Halifax, Nova Scotia to pursue a Chemistry and Biology degree at Dalhousie University. While she enjoyed her degree, Gillian felt something was missing and was drawn back to animals and the intriguing questions and challenges found in veterinary medicine. After volunteering and working at one of the University’s Animal Behavior Research Labs, Gillian knew veterinary medicine was the intriguing and rewarding career she needed. After being accepted into WCVM, Gillian fell deeply in love with the veterinary profession and the trials presented within it. Gillian does not have a career focus yet (because everything is enthralling), but she does have a particular interest in Pharmacology and Critical Care Medicine. Gillian excelled in veterinary school academically, and diversified her interests through involvement in every possible school activity and college club. In addition to being WCVM’s SCVMA Committee representative, Gillian is on her class’s social planning committee and is an executive in WCVM’s Emergency and Critical Care Club. In her oodles of spare time, Gillian is a violinist for the WCVM Chamber Orchestra, plays soccer and basketball on the school’s intramural teams, and is involved in radioactive therapy treatment for hyperthyroid cats. Last summer, Gillian assisted with horse drug research and this summer, Gillian is applying and reinforcing the last 2 years of vast knowledge crammed in her head through working at WCVM’s teaching hospital. Gillian is thrilled to plan the 2018 SCVMA Student Leadership Workshop, to be held at WCVM this fall, and is honored to be the CVMA ambassador for WCVM.

Florence Leduc, SCVMA Committee representative for the only French-speaking Canadian veterinary school, the Faculté de médecine vétérinaire (FMV) in Saint-Hyacinthe, Québec, was born in Montréal, Québec but moved to France at only 5 months old. She came back to Canada a few months later and spent her early years in Montréal, before finally moving to Austria at the age of 4. In Austria, Florence studied in German at school, learned to speak the Austrian dialect with her friends and premier cycle for the obtention d’un B.Sc. en santé animale où elle a été élue deux fois présidente du cours pré-vétérinaire et du Club de santé animale et elle a passé ses étés à travailler dans un centre de réadaptation, l’Alberta Institute for Wildlife Conservation. Depuis qu’elle s’est jointe à la promotion 2020 de l’UCVM, Erica est devenue membre de presque tous les clubs étudiants et est vice-présidente des activités pour le Club de comportement et de dressage qui a été nouvellement créé. Pour Erica, rendre la pareille et participer activement à la collectivité représentent des éléments essentiels de sa vie et c’est pourquoi elle s’est portée candidate à la position de représentant du Comité des ÉACMV. Elle se réjouit à la pensée de représenter l’ACMV et l’UCVM et de participer aux activités de l’Association.

Gillian Davies, représentante du Comité des ÉACMV pour le Western College of Veterinary Medicine (WCVM), est née et a grandi à Calgary, en Alberta, où elle a pris connaissance de la profession vétérinaire à un jeune âge et a passé beaucoup de temps à accabler son vétérinaire local avec ses questions. Après l’école secondaire, Gillian s’est enfuie à Halifax, en Nouvelle-Écosse, pour s’inscrire à un diplôme en chimie et en biologie à l’Université Dalhousie. Même si elle a aimé ses cours, Gillian sentait qu’il manquait quelque chose et elle a été de nouveau attirée par les animaux ainsi que par les questions et défis de la médecine vétérinaire. Après du bénévolat et du travail dans des laboratoires de recherche sur le comportement animal de l’université, Gillian a su que la médecine vétérinaire était la carrière fascinante et enrichissante dont elle avait besoin. Après avoir été acceptée au WCVM, Gillian s’est éperdument éprise de la profession vétérinaire et des défis qu’elle présentait. Gillian ne possède pas encore de choix de carrière (parce que tout semble si intéressant), mais elle s’intéresse particulièrement à la pharmacologie et à la médecine des soins critiques. Gillian obtient des résultats exceptionnels à l’école de médecine vétérinaire et elle a diversifié ses intérêts en participant à toutes les activités universitaires et aux clubs, dans la mesure du possible. En plus d’être la représentante du Comité des ÉACMV au WCVM, Gillian siège au comité des activités sociales de sa promotion et à l’exécutif du Club des soins d’urgences et critiques du WCVM. Dans ses moments libres fréquents, Gillian est violoniste pour l’orchestre de chambre du WCVM, elle joue au soccer et au basketball dans les équipes intramurales de l’école et elle participe à une thérapie de traitement radioactif pour les chats souffrant d’hypothyroïdie. L’été dernier, Gillian a porté assistance dans le cadre d’un projet de recherche sur des médicaments pour les chevaux et, cet été, Gillian applique et consolide les vastes connaissances qu’elle a acquises au cours des deux dernières années en travaillant à l’hôpital d’enseignement du WCVM. Gillian est ravie de planifier l’édition 2018 de l’Atelier de leadership étudiant des ÉACMV, qui se tiendra au WCVM cet automne, et elle est honorée d’être l’ambassadrice de l’ACMV pour le WCVM.

Florence Leduc, représentante du Comité des ÉACMV pour la seule école de médecine vétérinaire francophone, la Faculté de médecine vétérinaire (FMV) de l’Université de Montréal, à Saint-Hyacinthe, au Québec, est née à Montréal, au Québec, mais est déménagée en France à l’âge de seulement cinq mois. Elle est revenue au Canada quelques mois plus tard et a passé son enfance à Montréal, avant de finalement déménager en Autriche à l’âge de quatre ans. En Autriche, Florence a étudié l’allemand à
Brittany O’Brien, SCVMA Committee representative for the Ontario Veterinary College (OVC), was born in St. John’s, Newfoundland and Labrador but spent most of her life growing up in Southern Ontario with her parents and 2 younger sisters. From a young age, Brittany had a deep love for wildlife and dreamed of turning her passion for animals into a veterinary career. Before entering the world of veterinary medicine, Brittany completed her Bachelor of Science degree with a Specialization in Biology at the University of Waterloo. Brittany became fascinated with anatomy, physiology, and microbiology, and although she toyed with alternative career path ideas, her passion for l’écologie et a appris à parler le dialecte autrichien avec ses amis et sa sœur jumelle, et a conversé (dans la mesure qu’un enfant de quatre ans peut converser) en anglais et en français à la maison avec ses parents. Florence a grandi à courte distance des Alpes, ce qui lui a donné l’occasion de développer ses compétences en ski alpin, son amour du plein air et des aliments salés (les Autrichiens adorent le sel et Florence aussi) ainsi que son amour pour la nature et la faune. À l’âge de six ans, Florence a fondé l’équipe de secours des animaux errants avec son amie Hanna et elle s’est ensuite mise à « sauver » divers animaux dans le besoin (relatif) : un hérisson avec une tique sur son dos, les poissons dans le canal voisin lorsque la ville l’a vidé de ses eaux et un « chat errant » qui était en fait celui de son voisin. L’amour de Florence pour les soins aux animaux s’est vite transformé en un brûlant désir de devenir vétérinaire, un cheminement qu’elle est fière de suivre aujourd’hui.

Florence a fréquenté le Collège Marianopolis (ou CEGEP) à Montréal, où, par nostalgie pour sa carrière d’escrime du secondaire, elle s’est jointe à l’équipe d’aviron et s’est entraînée pour la compétition, et elle a même participé à la régate annuelle du Royal Canadian Henley à St. Catharines, en Ontario. Chaque semaine, il n’a pas été facile de concilier l’université, un entraînement d’aviron de 20 à 30 heures et des leçons de musique, mais la réception de sa lettre d’acceptation à la FMV pour étudier la médecine vétérinaire après le CEGEP a récompensé tous ses efforts. À son arrivée à la FMV, Florence s’est jointe au Club de médecine zoologique (CMZ) de la FMV et elle en est devenue vice-présidente ainsi que marraine et préposée de Luna, une Petite Nyctale âgée de 11 ans qui a perdu une aile lors d’un accident. Même si elle est assez certaine de son orientation de carrière, la première année de médecine vétérinaire de Florence a confirmé sa passion pour la médecine faunique et a intensifié son désir de travailler en réadaptation de la faune à l’avenir. Au début de sa deuxième année, Florence s’est jointe au comité des activités sociales de sa promotion, est devenue coprésidente du CMZ et a été élue représentante junior du Comité des ÉACMV de la FMV, enthousiaste à l’idée d’organiser l’édition 2019 du Symposium des ÉACMV qui se tiendra en janvier prochain à la FMV. Florence est extrêmement fière de représenter ses collègues étudiants en tant qu’agent de liaison avec l’ACMV et elle a hâte que ses collègues canadiens assistent à ce qui s’annonce comme un autre excitant Symposium.

Brittany O’Brien, la représentante du Comité des ÉACMV pour l’Ontario Veterinary College (OVC), est née à St. John’s, Terre-Neuve-et-Labrador, mais a grandi surtout dans le Sud de l’Ontario avec ses parents et ses deux jeunes sœurs. Dès un jeune âge, Brittany éprouvait un amour profond pour la faune et rêvait d’une carrière en médecine vétérinaire. Avant d’entrer dans le monde de la médecine vétérinaire, Brittany a obtenu un baccalauréat en sciences avec spécialisation en biologie à l’Université de Waterloo. Brittany est devenue fascinée par l’anatomie, la physiologie et la microbiologie et même si elle a songé à d’autres cheminement de carrière, sa passion pour les animaux l’a toujours ramenée à son rêve d’enfance de devenir vétérinaire. Pendant ses études de B.Sc., Brittany a travaillé à sa première clinique pour petits animaux et, après avoir créé d’excellentes relations avec l’équipe, les clients et les patients, elle savait qu’elle était destinée à une carrière en médecine vétérinaire. En 2015, Brittany a concrétisé son rêve et a présenté une demande à l’OVC.
animals always drew her back to her childhood dream of becoming a veterinarian. While completing her BSc, Brittany worked in her first small animal clinic, and after building many great team, client, and patient relationships, she knew a veterinary career path was right for her. In 2015, Brittany made her dream a reality and applied to OVC.

After months of waiting, Brittany was interviewed and later that summer received the mailed acceptance news. Although initially intimidated, Brittany quickly settled into her new veterinary world, making friends and becoming involved within the school and community. Currently, Brittany is OVC’s SCVMA Committee representative, the Class of 2020 social coordinator, and in addition to sitting on Class Council and the Central Veterinary Student Association (CVSA), Brittany is heavily involved with various clubs in and outside OVC. During her free time, Brittany loves travelling, hiking, camping, reading, and fostering kittens for the local Humane Society. In the future, Brittany hopes to open her own small animal practice and spend her career making a difference in the lives of animals and their families. Brittany is honored to be a part of the veterinary medicine community, and is excited by her SCVMA Committee position and the opportunities that come from being a CVMA ambassador.

Student President Finishes Term

La présidente des étudiants achève son mandat

The 2017/2018 school year wrapped up last spring! Congratulations to my fellow classmates across the country for completing another year of vet school. Whether it was your first or your last, I wish you all the best as you enjoy your summer endeavors. I know you will all make tremendous contributions to your communities throughout Canada and abroad. I encourage you to check out the upcoming VetRap newsletter, published in the fall, where you can read about some of our student members’ fascinating experiences. We love hearing your stories and sharing them with the student community. I would also like to extend huge congratulations to students who graduated this spring.


J’aimerais profiter de cette occasion pour remercier l’Association canadienne des médecins vétérinaires (ACMV) qui a enrichi notre expérience étudiante et a créé des liens entre les étudiants à l’échelle du pays. Du Symposium des ÉACMV à l’Atelier de leadership étudiant (ALE), en passant par des exemplaires gratuits de La Revue vétérinaire canadienne, l’ACMV s’est engagée à offrir des occasions excitantes pour permettre aux étudiants d’apprendre, de grandir et de créer des liens. Et le soutien ne s’arrête pas une fois que vous obtenez votre diplôme! L’ACMV possède un programme complet de services aux finissants qui comprend de nombreuses ressources, comme un programme de mentorat, un sondage annuel auprès des finissants, qui permet...
What a significant accomplishment; I wish you all the best in your careers.

I would like to take this opportunity to thank the Canadian Veterinary Medical Association (CVMA) for enriching our student experience and connecting students across the country. From the SCVMA Symposium, to the Student Leadership Workshop (SLW), to free copies of The Canadian Veterinary Journal, the CVMA is committed to providing exciting opportunities for students to learn, grow, and connect; and the support doesn’t stop when you graduate! The CVMA has a comprehensive New Graduate Program offering many resources, keeping veterinary students and early-career DVMs abreast of the current post-graduation trends, and discounted membership fees.

The CVMA is continuously looking for new ways to provide support and benefits to its members and adapting to the constantly changing world of veterinary medicine. Behind the scenes, there are dedicated veterinarians from across Canada working to ensure our ability to practice the highest quality of veterinary medicine is upheld. I encourage you to stay involved with the CVMA as you move into your careers, by continuing to comment on proposed position statements or even apply to join a committee. There are numerous advantages to being a CVMA member, and I encourage you to explore these on the website, or by contacting your college’s SCVMA representative.

I would especially like to thank the Students of the CVMA (SCVMA) Committee representatives for the 2017/2018 year: AVC’s Karie Bryenton who planned an outstanding SCVMA Symposium; FMV’s Marie-Anne Sirois, our editorial coordinator, who wrote wonderful articles for The Canadian Veterinary Journal; OVC’s Katelyn Elliot who hosted a tremendously successful SLW and put together the New Graduate Survey report, which is now available in the SCVMA section of the CVMA website; and WCVM’s Shawna Ellis who is currently compiling another exciting edition of the VetRap student newsletter! The support of the CVMA is complemented through these dedicated student representatives and would not be possible without them. Thank you!

As I head out into the world of 4th-year, I am pleased to be handing off the role of SCVMA president to Kate Rundle from the Atlantic Veterinary College. Kate and her fellow SCVMA representatives from the 5 Canadian veterinary colleges will take the lead on planning and executing our SCVMA initiatives to keep Canadian veterinary students connected and inspired. Please contact your student representatives if you have any comments or suggestions. We love to hear your ideas about how the CVMA can better support you as a veterinary student and in your future veterinary careers!

It has been an honor representing Canadian students on the CVMA Council this year. I wish you all the best in your future endeavors.

(by Kira Moser, UCVM Class of 2019, SCVMA President, 2017/2018)
In April 2018, the Canadian Veterinary Medical Association (CVMA) released its newest edition of *A Code of Practice for Canadian Kennel Operations*. Seven years in the making, the over 80-page document incorporates new scientific evidence in many aspects of dog breeding and kennel management, including behavior and social needs, housing, medicine, and nutrition. The latest Kennel Code applies to various environments in which dogs are kept for breeding purposes, ranging from a private home to a large facility. It also has specific considerations for working dogs and aging dogs. The current Kennel Code is available in English only, but a French version will be released later in the year. To download a copy, visit the Practice Tools section under the Practice & Economics tab on the website (www.canadianveterinarians.net).

**Vaccines Save Lives!**
**Happy. Safe. Healthy.**

**Animal Health Week:**
**September 30–October 6, 2018**

The Canadian Veterinary Medical Association has been running the Animal Health Week campaign for more than 30 years and this year we want to emphasize the importance of vaccinations. We are underscoring the importance of protecting animals from disease and illness through immunization. Preventing illness is safer, more effective, and more economical than treating it.

During Animal Health Week, from September 30 to October 6, 2018, we’re reminding animal owners they can help protect the animals in their care by ensuring they receive the vaccinations they need to be healthy, safe, and happy. This year’s theme, Vaccines Save Lives! provides us with an opportunity to remind animal owners to speak to their veterinary teams about creating the best individual vaccination protocol for their animals. A vaccinated animal is a happy, safe, and healthy animal.

**Les vaccins sauvent des vies!**
**Heureux. Protégés. En santé.**

**Semaine de la vie animale :**
**Du 30 septembre au 6 octobre 2018**

L’Association canadienne des médecins vétérinaires célèbre la campagne de la Semaine de la vie animale depuis plus de 30 ans et, cette année, nous désirons insister sur l’importance des vaccins. Nous soulignons l’importance de la protection des animaux contre les maladies par l’immunisation. La prévention des maladies est plus sécuritaire, plus efficace et plus économique que le traitement.

Durant la Semaine de la vie animale, qui se déroulera du 30 septembre au 6 octobre 2018, nous rappellerons aux propriétaires d’animaux qu’ils peuvent aider à protéger les animaux confiés à leurs soins en veillant à ce qu’ils reçoivent les vaccins dont ils ont besoin pour être en santé, protégés et heureux. Le thème de cette année, «Les vaccins sauvent des vies!» représente l’occasion de rappeler aux propriétaires d’animaux qu’ils doivent parler à leurs équipes vétérinaires afin de créer le meilleur...
We’re reminding animal owners about these 5 Reasons to Vaccinate:

• Vaccinations are safe and effective — they prevent many animal illnesses.
• Vaccinations protect everyone — they prevent diseases that can be passed not only from animal to animal, but also from animal to human.
• Vaccinations are an important part of annual health exams.
• Vaccinations are tailored to each animal based on its breed, age, overall health, and disease exposure risk.
• Vaccinations can help avoid costly treatments for diseases that can be prevented.

Celebrate Animal Health Week

We invite veterinary health teams to celebrate Animal Health Week with us. Each year veterinary teams rank waiting room displays as the most popular way of celebrating Animal Health Week, followed closely by client contests. In addition to the displays as the most popular way of celebrating Animal Health Week with us. Each year veterinary teams rank waiting room displays as the most popular way of celebrating Animal Health Week, followed closely by client contests. In addition to the official campaign poster, the following items are available to engage your entire healthcare team and help celebrate Animal Health Week:

• Biodegradable balloons
• Paw shaped pet food scoop (new)
• Animal Health Week socks (new)
• Temporary tattoos
• Pet rescue window decals
• CVMA Activity Book “Big or Small, We Help Them All!”
• Puppy sports pack, which can be used for a variety of activities like carrying sports gear or beach apparel
• T-shirts and V-neck pullover scrub shirts (both available in men’s and women’s sizes) featuring fear free colors!

Place your order before the early bird deadline on July 20, 2018 for a chance to win a $100 Subway gift card (enough to treat the whole team to lunch!) and other fun prizes. Placing your order online (instead of faxing or mailing it) (www.canadianveterinarians.net) also gives you a chance to win a $50 Tim Horton’s gift card (treat your hard-working team to a delicious morning steam)! The last day to place your order for Animal Health Week materials is August 3, 2018.

5 Reasons to Vaccinate:

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For additional information on Animal Health Week, follow CVMA on Twitter (in English @CanVetMedAssoc and in French @Assoccanmedvet) and Instagram (@CVMA.ACMV), and like us on Facebook (face book.com/CanadianVeterinaryMedicalAssociation). Use #AnimalHealthWeek for all of your Animal Health Week social media promotions.

Our generous supporters

Generous support of the 2018 Animal Health Week campaign is provided by Principal Sponsor, Petsecure, Program Plus Sponsor, Merck, and Program Sponsor, iFinance Canada (Petcard). This month, we invite you to learn more about our Program Plus Sponsor, Merck.

A message from Merck

Merck is a global healthcare leader working to help the world be well. Merck Animal Health, known as MSD Animal Health outside the United States and Canada, is the global animal health business unit of Merck. Through decades of experience and true commitment to research and testing, Merck Animal Health offers a wide range of safe and effective vaccines, called Nobivac, to protect dogs and cats. They help veterinarians provide the high-quality care pets need — and owners expect. Vaccination is the essential first step to ensure an animal lives a long, satisfying life. Keep pet owners informed about the benefits of vaccination with the help of Nobivac’s educational materials, so they can maintain long-lasting bonds with their pet.

Merck is also dedicated to protecting the health of large animals. The well-being of beef or dairy cattle, food quality and safety, are issues involving the entire society, from farmers to consumers. The logical next step is to prevent diseases in animals and increase efficiency. Vaccination and early vaccination play an important role in prevention and benefit the animal, the farmer, and the consumer. Vaccination should be considered a natural practice in modern farming, as natural as giving your animals healthy food and fresh water. The Bovilis® brand has an important task ahead of it. We need to make sure it has maximum power to meet the challenges that are about to transform cattle health management around the world. Bovilis® empowers the age of prevention.

CVMA members can obtain Merck products through all distributors in Canada: Associated Veterinary Specialists Inc. (AVSI), Veterinary Purchasing (VP), Centre distribution des medicaments vétérinaires (CDMV), Western Drug Distribution Centre (WDDC), and Associated Veterinary Purchasing (AVP). For more information about our vaccines portfolio, contact your Merck Animal Health representative.

Merck Animal Health

Nos généreux commanditaires

Un généreux soutien de la campagne de la Semaine de la vie animale 2018 est fourni par le commanditaire principal, Petsecure, le commanditaire de programme plus, Merck, et le commanditaire de programme, iFinance Canada (Petcard). Ce mois-ci, nous vous invitons à en apprendre davantage à propos de notre commanditaire de programme plus, Merck.

Un message de Merck

Merck est un chef de file mondial des soins de santé qui travaille en vue de contribuer à la santé mondiale. La compagnie Merck Santé animale, qui est connue sous le nom de MSD Animal Health à l’extérieur des États-Unis et du Canada, est l’unité d’affaires mondiale en santé animale de Merck. Grâce à des décennies d’expérience et d’engagement véritable envers la recherche et les essais, Merck Santé animale offre un vaste éventail de vaccins sûrs et efficaces, appelé Nobivac, afin de protéger les chiens et les chats. Ils aident les vétérinaires à fournir les soins de haute qualité dont ont besoin les animaux de compagnie et auxquels s’attendent les propriétaires. La vaccination est la première étape essentielle afin d’assurer que l’animal vivra une vie longue et satisfaisante. Informez les propriétaires d’animaux à propos des bienfaits de la vaccination à l’aide du matériel éducatif de Nobivac afin qu’ils puissent maintenir des liens durables avec leur animal de compagnie.

Merck se voue aussi à la protection de la santé des grands animaux. Le bien-être des bovins de boucherie ou des bovins laitiers ainsi que la qualité et la salubrité des aliments sont des enjeux qui touchent l’ensemble de la société, des producteurs aux consommateurs. La prochaine étape logique consiste à prévenir les maladies chez les animaux et à accroître l’efficacité. La vaccination et la vaccination précoce jouent un rôle important dans la prévention et sont bénéfiques pour l’animal, le producteur et le consommateur. La vaccination devrait être considérée une pratique naturelle dans l’agriculture moderne, tout aussi naturelle que les aliments sains et nutritifs et l’eau fraîche que vous donnez à vos animaux. La marque BovilisMD devra accomplir une tâche importante. Nous devons nous assurer qu’elle est dotée du pouvoir maximum afin de relever les défis qui s’apprécient à transformer la gestion de la santé du bétail partout dans le monde. BovilisMD habilite l’ère de la prévention.

Les membres de l’ACMV peuvent obtenir des produits Merck par l’entremise de tous les distributeurs au Canada : Associated Veterinary Specialists Inc. (AVSI), Veterinary Purchasing (VP), Centre distribution des médicaments vétérinaires (CDMV), Western Drug Distribution Centre (WDDC), et Associated Veterinary Purchasing (AVP). Pour en savoir davantage à propos de notre portefeuille de vaccins, contactez votre représentant de Merck Santé animale.
INFLUENCE
ADVANCING YOUR ISSUES, YOUR CONCERNS AND YOUR PROFESSIONAL INTERESTS.

As a CVMA member you benefit from...
- Engagement with Government and key stakeholders to influence policy decisions
- International relations to provide the Canadian veterinary perspective
- Media and public relations to provide balanced and trustworthy information and to promote veterinary professionals
- Position statements on animal welfare and national veterinary issues
- Codes of practice for Canadian kennel and cattery operations, and for the care and handling of farm animals
- Member consultations and online discussions on key veterinary issues
- Pan-Canadian Framework for Professional Standards in Veterinary Oversight of Antimicrobial Use.

KNOWLEDGE
KEEPING YOU CURRENT ON VETERINARY SCIENCE AND PRACTICE, RESEARCH, INNOVATION AND TRENDS TO ENHANCE YOUR LIFELONG LEARNING.

As a CVMA member you benefit from...
- The Canadian Veterinary Journal
- Canadian Journal of Veterinary Research
- Clinician’s Brief™ (free global digital edition)
- CVMA national convention
- CVMA Veterinary Summit
- CVMA National Issues Forum
- CVMA Emerging Leaders Program
- CVMA Canadian Veterinary Reserve
- Member e-newsletter ‘Online from 339’
- CVMA online continuing education portal
- VetFolio® online educational resources (subscription discount)

RESOURCES
SUPPORTING YOU THROUGH EVERY STAGE OF YOUR CAREER WITH ACCESS TO EXCLUSIVE PRACTICE TOOLS AND RESOURCES.

As a CVMA member you benefit from...
- NEW! CVMA Petcard™ Program - financing options for your clients
- NEW! Moneris™ preferred payment processing rates for CVMA members
- MyVetStore.ca™ - CVMA web store solution for clinics
- Practice owner’s economic survey
- Individual practice diagnostic and valuation report
- Provincial suggested fee guide
- Associate compensation and benefits report
- Compensation report for non-DVM staff
- Compensation report for DVMs outside private practice
- Practice management articles and resources
- CVMA group insurance program
- CVMA mentoring program
- VetLaw Online™ legal advice column
- CVMA Green Veterinary Practice and self-audit tool
- Antimicrobial SmartVet mobile app
- Veterinarian health and wellness resources
- Early career DVM web resource hub
- Guidelines for the successful employment of new veterinary graduates
- Sedative, anaesthetic and pain management protocols posters
- Guidelines for the legitimate use of compounded drugs in veterinary practice
- Antimicrobial prudent use guidelines for beef cattle, dairy cattle, poultry and swine
- Therapeutic decision cascade poster
- Animal abuse resources for practitioners faced with this issue
- Preventive healthcare, nutritional assessment and client education tools and resources
- Animal health week annual public awareness campaign

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- NEW! Mont Tremblant SkiMax (discount on lift tickets)
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For information about the many benefits and privileges of membership.

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01/2018
For 70 years, the Canadian Veterinary Medical Association (CVMA) has supported and advanced the interests of Canada’s veterinarians and provided leadership by tackling issues that may affect daily veterinary practice and career success.

The CVMA’s mandate is to represent the veterinarians of Canada; a strong membership strengthens the profession’s collective voice and political influence with government, policy makers, and interactions with industry stakeholders, media, and the public.

The CVMA is involved with several complex issues that affect veterinarians, clients, animals, food safety, trade, mobility, and the future education of veterinarians.

The Association has lobbied the federal government to move forward with regulatory and policy changes to improve antimicrobial stewardship, preserve veterinarians right to extra-label drug use and use of compounded drugs, and has advocated for the timely approval of veterinary drugs for food-producing and companion animals.

The public holds veterinarians in high esteem when it comes to the welfare and protection of animals. As an advocate of animal welfare, the CVMA has developed numerous position statements addressing animal welfare concerns; participated in consultations on welfare issues; and played a strong role in examining animal welfare aspects of proposed legislation. Through CVMA’s advocacy efforts and unified approach, the veterinary profession is seen as an active participant in formulating protocols that promote responsible care and handling of animals, and thereby preserve that public trust.

The CVMA recognizes that veterinarians want to have a meaningful career in a supportive environment, be valued for what they do, achieve financial success, and enjoy a work-life balance. For many years, veterinary economic surveys have been taking place annually as part of the CVMA Business Management Program. As the national aggregator, curator and facilitator, CVMA delivers to each province, and at no cost to our members, the suggested fee guides, the compensation and benefits reports for associate veterinarians, the compensation reports for non-DVM staff, and the individual practice diagnostic reports.

The Canadian Veterinary Journal (The CVJ) and the Canadian Journal of Veterinary Research (CJVR) are the only national, general or multi-species, peer-reviewed veterinary journals in Canada. Both journals respond to a demand for research and knowledge in various fields of veterinary medicine. The reality is that our membership count impacts circulation numbers, and circulation affects advertising revenue. If circulation figures...
La Revue vétérinaire canadienne (La RVC) et la Revue canadienne de recherche vétérinaire (RCRV) sont les seules revues vétérinaires nationales, à contenu général ou multi-espèces, évaluées par les pairs au Canada. Les deux revues répondent à un besoin de recherche et de connaissances dans les divers domaines de la médecine vétérinaire. Or, la réalité est que l’effectif de l’Association a un impact sur les tirages et que le tirage influence nos recettes publicitaires. Si les tirages diminuent et occasionnent une chute des recettes publicitaires, cette situation pourrait menacer la continuité de la viabilité de la publication de La RVC et de la RCRV.

Est-ce que tous les médecins vétérinaires du Canada bénéficient du travail de l’ACMV? Sans l’ombre d’un doute. Et ceux qui appuient l’association professionnelle nationale sont conscients des enjeux et reconnaissent d’emblée son importance cruciale.

Merci aux plus de 7200 membres qui appuient leur ACMV et sa mission, et aux 7100 techniciens et technologues vétérinaires qui sont des affiliés de l’ACMV par l’entremise de Technologues et techniciens vétérinaires agréés du Canada (TTVAC). Et merci aux plus de 600 bénévoles ainsi qu’au petit groupe d’employés pour leur dévouement!

Le rapport suivant présente un sommaire des principales activités entreprises par l’ACMV en 2017.

Dr./Dr Troy Bourque
CVMA President 2016–2017
Président de l’ACMV 2016–2017

Dr./Dre Troye McPherson
CVMA President 2017–2018
Présidente de l’ACMV 2017–2018

Corporate Partnership Program
Programme de partenariats avec des entreprises

The CVMA Corporate Partnership Program (CPP) is a comprehensive sponsorship program that was implemented to better recognize a company’s overall financial contribution to the Association. Celebrating its 10th year in 2017, the CPP continues to evolve each year and takes into account the various programs and events that are corporately sponsored, allowing companies that support the CVMA in various aspects to get better recognition for their overall contributions. The 3 levels of sponsorship in 2017 were Platinum (> $80 000), Gold ($48 000–$79 999) and Silver ($27 000–$47 999).

The CVMA would like to extend recognition to the following sponsors for their overall contribution to the Association for 2017:

Gold: Merck Animal Health
Scotiabank
Virox Animal Health

Silver: Boehringer Ingelheim
Hill’s Pet Nutrition Canada Inc.
IDEXX Laboratories
Petsecure Pet Health Insurance

Le Programme de partenariats avec des entreprises (PPE) de l’ACMV est un programme de commandite inclusif qui a été mis en œuvre afin de mieux reconnaître la contribution financière globale d’une entreprise à l’Association. Le PPE a célébré sa 10e année en 2017 et il continue d’évoluer chaque année en tenant compte des divers programmes et événements qui font l’objet de commandites, ce qui permet aux entreprises d’appuyer l’ACMV dans divers domaines afin d’être mieux reconnues pour leurs contributions globales. En 2017, les trois niveaux de commandite étaient Platin (>= 80 000 $), Or (48 000 à 79 999 $) et Argent (27 000 à 47 999 $).

L’ACMV tient à remercier les commanditaires suivants de leur contribution générale à l’Association en 2017:

Or: Merck Santé animale
Banque Scotia
Virox Animal Health

Argent: Boehringer Ingelheim
Hill’s Pet Nutrition Canada Inc.
IDEXX Laboratories
Petsecure assurance maladie pour animaux
Animal Welfare
Bien-être animal

The CVMA Animal Welfare Committee (AWC) deals with a wide range of issues of concern to Canadian veterinarians and the public with respect to the humane treatment of animals. Committee members include those from companion and food animal practice, animal welfare research, wildlife and zoo animal medicine, and laboratory animal medicine. Ex-officio members include those from the Canadian Food Inspection Agency (CFIA), Canadian Federation of Humane Societies (CFHS), Ontario Veterinary Medical Association (OVMA), the Canadian Association of Laboratory Animal Medicine (CALAM), and the Registered Veterinary Technologists and Technicians of Canada (RVTTTC).

The AWC conducts extensive reviews of scientific and ethical dimensions of animal welfare issues of importance to veterinarians and the public. During 2017, the AWC commenced review and revision of existing position statements on Trapping of Fur-Bearing Animals; Castration of Horses, Donkeys and Mules; Castration of Cattle, Sheep and Goats; and Dog Breeding. In addition, the AWC began work on new position statements on Use of Pain Technologies in Animals; Use of Animals in Competitive Sport; Use of Animals in Entertainment & Recreation; Marketing of Cull Dairy Cows; Service Dogs; and Housing of Laying Hens.

Revised position statements on Veterinary Reporting of Animal Abuse; Capture of Wild Animal for the Pet Trade, and Transportation of Cats and Dogs were presented to and approved by CVMA Council during 2017.

The AWC continued work on the revision of Code of Practice for Canadian Kennel Operations (2nd Edition) in consultation with AWC members and external stakeholders. The revised Kennel Code (3rd Edition) was published in spring 2018.

With the support of the AWC, the CVMA lobbied the federal government in support of enhancements to Animal Cruelty legislation including meeting with the Animal Welfare Caucus of the Liberal Party. The AWC participated in the Ad Hoc Committee as part of the National Farm Animal Care Council (NFACC) formed to examine gaps in Canada’s Criminal Code with respect to cruelty to animals and to seek common understanding with industry and other stakeholders as to a forward action plan aimed at updating the Criminal Code. As a result, a joint letter from participating organizations was sent to Justice Minister Wilson-Raybould encouraging the federal government to take action to amend sections of the Criminal Code to better address animal fighting and bestiality.

The AWC provided expert representation before the Parliamentary Standing Committee on Agriculture on the pro-
National Issues
Enjeux nationaux

The National Issues Committee (NIC) considers a wide range of issues of concern to the veterinary profession in Canada. During 2017, the NIC revised and CVMA Council approved a position statement on Veterinary Dentistry. Reviews of several current position statements were undertaken including Complementary and Alternative Veterinary Medicine; Raw Food Diets for Pets; and Vaccination Protocols for Dogs and Cats. The position statements on Importation of Veterinary Products and Active Pharmaceutical Ingredients (APIs) for Veterinary Use were rescinded since recent changes to federal regulations had addressed the issues. A new position statement on service dogs was proposed to Council and will be undertaken in 2018.

The 2nd National Issues (NI) Forum was held at the CVMA Convention in Charlottetown, Prince Edward Island in 2017 with the aim of reviewing CVMA’s current position on Complementary and Alternative Veterinary Medicine and engaging members to provide advice to the NIC during its review process. The event involved presentations from 3 panelists with the aim of reviewing CVMA’s current position on Complementary and Alternative Veterinary Medicine and providing advice to the NIC during its review process. The event involved presentations from 3 panelists.

Le Comité sur les enjeux nationaux (CEN) se penche sur un vaste éventail d’enjeux qui préoccupent la profession vétérinaire au Canada. Durant 2017, le CEN a révisé un énoncé de position sur la dentisterie vétérinaire qui a été approuvé par le Conseil de l’ACMV. Un examen de plusieurs énoncés de position actuels a été entrepris, y compris ceux sur la médecine vétérinaire complémentaire et parallèle, les diètes à base d’aliments crus pour les animaux de compagnie et les protocoles de vaccination pour les chiens et les chats. Les énoncés de position sur l’importation des produits vétérinaires et l’importation des ingrédients pharmaceutiques actifs à usage vétérinaire ont été supprimés en raison des changements récents apportés à la réglementation fédérale qui ont permis de résoudre ces questions. Un nouvel énoncé de position sur les chiens d’assistance a été proposé au Conseil et sa rédaction sera entreprise en 2018.

En 2017, le deuxième Forum sur les enjeux nationaux s’est tenu au congrès de l’ACMV à Charlottetown, à l’Île-du-Prince-Édouard, dans le but d’évaluer la position actuelle de l’ACMV...
ists, discussion and live polling, and was attended by 100 veterinarians. A working group was formed to develop plans for the 2018 NI Forum in Vancouver on the topic of Cannabinoids in Veterinary Medicine.

The NIC works closely with CVMA Communications on engaging members on position statements, addressing questions and concerns from members and the public, and on keeping current relevant information material on the CVMA website. In 2017, for example, the NIC contributed to new publicly available on-line documentation on cannabis and pets. In addition, the NIC engaged in discussions with Health Canada on the role of veterinarians in the opioid crisis and assisted with the development of reference documents for veterinarians on the subject.

A major focus of NIC deliberations continued to be antimicrobial resistance (AMR) and strategies to support antimicrobial stewardship and antimicrobial use (AMU) surveillance. This effort is ongoing given changes to federal policies and regulations that began in 2017 and will continue for several years. The current changes will enhance veterinary oversight of AMU in animals, including the requirement for mandatory prescriptions for medically important veterinary antimicrobials.

The CVMA’s Veterinary Pharmaceutical Stewardship Advisory Group (VPSAG) provided direction for the development of 2 projects aimed at strengthening veterinary oversight of AMU in animals. The first project commenced in early 2017 with support from the CFIA and was titled AMU Surveillance at the Veterinary Prescription Interface. The 2nd project supported by Agriculture and Agri-Food Canada was directed at supporting excellence in AMU stewardship through the Renewal of the CVMA Guidelines for the Prudent Use of Veterinary Antimicrobial Medications. It focused on the development of new tools to support veterinarians in making sound decisions on the use of veterinary antimicrobial drugs. Both projects are expected to lead to new phases of work in 2018 and beyond. Presentations on CVMA’s activities related to AMR were made to key stakeholders in late 2017 including the National Farmed Animal Health and Welfare Council (NFAHWC) and Canadian Global Food Animal Residue Avoidance Databank (cGFARAD). The CVMA appeared before the House of Commons Health Committee to discuss CVMA activities in addressing AMR.

The NIC was engaged by way of consultation and written feedback with federal agencies on topics such as the Cannabis Act and regulations, the use of spot-on products in pets, and changes to federal fees for veterinary drug establishment licenses and product registrations.

The CVMA provided representation at meetings with Canadian Animal Health Coalition (CAHC), Canadian Animal Health Institute (CAHI), Canadian Animal Health Surveillance System (CAHSS), Canadian Cattle Identification Agency (CCIA), Canadian Animal Health Products Advisory Committee (CAHPAC), Canadian Council of Veterinary Registrars (CCVR), Ad Hoc Committee on Veterinary Antimicrobial Stewardship, National Farmed Animal Health and Welfare Council (NFAHWC), the American Veterinary Medical Association (AVMA), and others.

Internationally, the NIC engages colleagues through organizations such as the World Small Animal Veterinary Association sur la médecine complémentaire et parallèle et d’engager les membres afin de conseiller le CEN durant son processus d’examen. Durant le Forum, trois panélistes ont présenté un exposé et des discussions et sondages en direct ont eu lieu devant les 100 vétérinaires qui ont assisté à l’événement. Un groupe de travail a également été formé pour entamer la planification du Forum 2018 sur les enjeux nationaux à Vancouver qui portera sur le sujet des cannabinoïdes en médecine vétérinaire.

Le CEN travaille en étroite collaboration avec les communications de l’ACMV afin d’inviter les commentaires des membres sur les énoncés de position, d’aborder les questions et les préoccupations des membres et du public et de publier des renseignements pertinents sur le site Web de l’ACMV. Par exemple, en 2017, le CEN a tenu des discussions avec Santé Canada sur le rôle des vétérinaires dans la crise des opioïdes et a collaboré à l’élaboration de documents de référence pour les vétérinaires à ce sujet.

Un sujets important des délibérations du CEN a continué d’être l’antibiorésistance et les stratégies pour appuyer l’antibiogouvernance et la surveillance de l’utilisation des antimicrobiens. Cet effort est soutenu en raison des modifications aux politiques et aux règlements fédéraux qui ont commencé en 2017 et se poursuivront pendant plusieurs années. Les modifications actuelles rehausseront la surveillance vétérinaire de l’utilisation des antimicrobiens chez les animaux, y compris l’exigence de prescriptions obligatoires pour les antimicrobiens vétérinaires importants sur le plan médical.


Le CEN a interagi avec les agences fédérales dans le cadre de consultations et de commentaires par écrit sur des sujets comme la Loi sur le cannabis et son Règlement, l’utilisation des produits topiques chez les animaux de compagnie et les changements apportés aux frais fédéraux pour les licences d’établissements pharmaceutiques et l’enregistrement des produits.
(WSAVA) and the World Veterinary Association (WVA) among others. During 2017, for example, the NIC provided input to WSAVA on its Global Dental Guidelines and to WVA on its policy statement on the Veterinary Body.

The NIC continues to monitor the activity of the NFAHWC and seeks opportunities to provide input on issues that are important to the veterinary community (e.g. disease surveillance, codes of practice incorporation into provincial regulations, and antimicrobial stewardship/resistance).

Communications & Public Relations

Communications et relations publiques

The CVMA received 111 media inquiries in 2017, with one of the biggest media interests around the announcement of CVMA’s revised position statement on Partial Digital Amputation (Onychectomy or Declawing) of the Domestic Felid. The announcement resulted in a number of online and print interviews and included a CBC radio syndication inquiry, which allowed Dr. Enid Stiles and Dr. Sherlyn Spooner to conduct interviews across Canada. Marijuana and pets was still a big media topic, along with interviews for Animal Health Week, National Tick Awareness Month, and the 2017 CVMA Convention and CVMA Awards held on Prince Edward Island.

The CVMA continues to increase social media activity. By the late fall of 2017, the CVMA’s Facebook page hit over 8300 likes and its combined English and French Twitter followers were over 9600. Its YouTube Channel featured the 2017 National Tick Awareness Month video and the 2017 Animal Health animated video. Dr. Bob Bellamy once again shared with CVMA 7 more informative animal health videos from his collection by Wow Factor Media, including one on antimicrobial resistance. The CVMA has used the Bellamy videos periodically on Twitter and Facebook. In 2018, the CVMA added Instagram.

L’ACMV a assuré une représentation à des réunions avec la Coalition canadienne pour la santé des animaux de compagnie (CCSAC), l’Institut canadien de la santé animale (ICSA), le Système canadien de surveillance de la santé animale (SCSSA), la Canadian Cattle Identification Agency (CCIA), le Comité consultatif canadien sur la réglementation des produits de santé animale (CCCRPSA), le Conseil canadien des registraires vétérinaires (CCRV), le Comité ad hoc sur l’antibiogouvernance vétérinaire, le Conseil national sur la santé et le bien-être des animaux d’élevage (CNSBEAE), l’American Veterinary Medical Association (AVMA) et d’autres organismes.

À l’échelle internationale, le CEN interagit avec les collègues notamment avec des organisations comme la World Small Animal Veterinary Association (WSAVA) et l’Association mondiale vétérinaire. Par exemple, en 2017, le CEN a fourni de la rétroaction à la WSAVA sur ses Lignes directrices mondiales sur les soins dentaires et à l’AMV sur son énoncé de politique sur l’organisme de réglementation vétérinaire.

Le CEN continue de surveiller l’activité du CNSBEAE et il recherche des occasions de fournir de la rétroaction sur les enjeux qui sont importants pour la collectivité vétérinaire (p. ex., la surveillance des maladies, l’intégration des Codes de pratiques dans les règlements provinciaux ainsi que l’antibiogouvernance et l’antibiorésistance).

Durant 2017, l’ACMV a reçu 111 demandes de renseignements de la part des médias. L’annonce de la révision de l’énoncé de position de l’ACMV sur l’amputation partielle des doigts (onychectomie ou dégriffage) des félin des domestiques a été l’une des nouvelles qui a suscité le plus grand intérêt et plusieurs entrevues en ligne et dans les médias imprimés, dont une demande de syndication de la part de la radio anglophone de Radio-Canada, ce qui a permis à la Dr Enid Stiles et à la Dr Sherlyn Spooner de donner des entrevues à l’échelle du Canada. Un autre sujet d’intérêt pour les médias a été le cannabis et les animaux de compagnie de même que la Semaine de la vie animale, le Mois national de la sensibilisation aux tiques ainsi que le congrès 2017 de l’ACMV et la cérémonie de remise des prix qui ont eu lieu à l’Île-du-Prince-Édouard.

L’ACMV continue d’accroître ses activités dans les médias sociaux. À la fin de 2017, la page Facebook de l’ACMV a atteint plus de 8300 J’aime et le nombre combiné de suiveurs de Twitter, en français et en anglais, s’élevait à plus de 9600 personnes. Son canal YouTube a présenté la vidéo du Mois national de la sensibilisation aux tiques 2017 et la vidéo animée de la Semaine de la vie animale 2017. Le Dr Bob Bellamy a de nouveau partagé avec l’ACMV sept autres vidéos informatives sur la santé animale tirées de sa collection de Wow Factor Media, y compris une vidéo sur l’antibiorésistance. L’ACMV a utilisé périodiquement les vidéos de Bellamy sur Twitter et Facebook. En 2018, l’ACMV a ajouté Instagram.
Facebook. In 2018, CVMA added Instagram as another avenue to share messages to pet owners and veterinary clinics.

The CVMA continued its awareness campaign in 2017 on Facebook and Twitter to promote the value of veterinary healthcare to the public. The hashtags #VetCareEverywhere and #VétérinairesPartenaires were used with a series of veterinary healthcare statements.

The CVMA, in partnership with the Canadian Council of Veterinary Registrars, began a campaign in 2016 in response to the federal government’s announcement that new regulations would require veterinary oversight of the use of antimicrobials administered to food animals, including those administered in feed or water. With a deadline officially set for December 1, 2018, the CVMA continued with the campaign in 2017, sending messages to all veterinarians and provincial and territorial veterinary associations and regulatory bodies under the banner of Veterinary Oversight of Antimicrobial Use in Canada: Regulations are Changing...We Want You Prepared. Communications tactics also included e-mails, news releases, social media and postings on the CVMA website.

The CVMA joined a sub-committee of the Canadian Animal Health Products Regulatory Advisory Committee to discuss the implementation and impacts of Health Canada’s move to include all medically important antimicrobials (veterinary drugs) to the Prescription Drug List. The sub-committee members represent a cross-section of the drug industry, food producers, feed producers, Health Canada, and Canadian Food Inspection Agency. Recognizing the importance of collaboration and clear understanding, the Sub-Committee began to develop plans around consistent communication regarding the transition, engagement of stakeholders, and implementation of key timelines.

A dedicated web page created on the CVMA’s website, called Veterinary Oversight of Antimicrobial Use in Animals in Canada, houses all relevant information on the changes. This includes a diagram created by the CVMA, in conjunction with the Veterinary Drugs Directorate and the Canadian Animal Health Institute, to outline the dates and intent of the various changes that may affect veterinary practices.

In late summer, the CVMA joined the Coalition for Small Business Tax Fairness, along with 73 other Canadian organizations, opposing federal government tax proposals that would dramatically change the way incorporated small businesses are

comme un autre moyen de partager des messages avec les propriétaires d’animaux et les cliniques vétérinaires.

En 2017, l’ACMV a poursuivi sa campagne de sensibilisation sur Facebook et Twitter afin de promouvoir la valeur des soins vétérinaires auprès du public. Les mots-clics #VétérinairesPartenaires et #VetCareEverywhere ont été utilisés avec la série de messages sur les soins vétérinaires.

En 2016, l’ACMV, en partenariat avec le Conseil canadien des registraires vétérinaires, a entamé une campagne en réponse à l’annonce du gouvernement fédéral stipulant que la nouvelle réglementation exigerait la surveillance vétérinaire de l’utilisation des antimicrobiens administrés aux animaux destinés à l’alimentation, y compris ceux administrés dans les aliments ou l’eau. La date limite a été officiellement fixée au 1er décembre 2018 et l’ACMV a poursuivi sa campagne en 2017 en envoyant des messages à tous les vétérinaires et aux associations provinciales et territoriales de médecins vétérinaires ainsi qu’aux organismes de réglementation sous la bannière de Surveillance vétérinaire de l’utilisation des antimicrobiens au Canada : les règles vont changer...Soyez prêts! Les tactiques de communication ont aussi inclus des courriels, des communiqués de presse, des messages dans les médias sociaux et sur le site Web de l’ACMV.


Une page dédiée du site Web de l’ACMV, intitulée Surveillance vétérinaire de l’utilisation des antimicrobiens chez les animaux au Canada, héberge tous les renseignements pertinents à l’égard des modifications et inclut notamment un diagramme créé par l’ACMV, de concert avec la Direction des médicaments vétérinaires et l’Institut canadien de la santé.
taxed in Canada. Veterinarians across Canada have been kept up-to-date on information from the Coalition via e-mails, web news posts and social media. The CVMA will continue to advocate for veterinarians in 2018.

For the 2nd year, the CVMA, in partnership with Merck Animal Health, declared March as National Tick Awareness Month. A “public service announcement” style of video was produced to help increase dog-owner awareness of the importance of early tick control, and to encourage clients to talk to their veterinarian about the risk ticks may pose to dogs. This was shared and amplified on CVMA’s Twitter and Facebook. The result was over 600 000 Facebook views of the English video and over 150 000 views of the French video. The 2017 campaign materials also included a webinar that was available until March 1, 2018, a poster and social media messages.

Animal Health Week ran from October 1 to 7, 2017 with the theme, “Animal Welfare: Safeguarding the Five Animal Freedoms.” Generous support of the campaign was provided by the Principal Plus Sponsor, Boehringer Ingelheim; Principal Sponsor, Petsecure Pet Health Insurance; and Program Sponsors, iFinance Petcard and Elanco. A national news release was distributed the week prior to Animal Health Week. In addition, targeted media pitches were sent to various outlets across the country, resulting in media coverage. The Canadian Food Inspection Agency distributed Animal Health Week posters through departments across Canada and invited the CVMA to provide 2 presentations during AHW. Photos from Animal Health Week events were shared on the CVMA Facebook page and Twitter feed during the campaign period.

In September 2017, the CVMA Communications team arranged the first provincial veterinary medical association (VMA) communications meeting. The informal bi-monthly meeting allows each provincial VMA an opportunity to share projects and ideas, and, ultimately, to find ways to work together. The meetings will continue throughout 2018.

Mass e-mail and fax bulletins, social media updates, articles in provincial publications, information on the CVMA’s website, and in the CVMA’s monthly eNewsletter continue to provide members with relevant CVMA program updates and general veterinary news.

La Semaine de la vie animale s’est déroulée du 1er au 7 octobre 2017 sous le thème : «Protéger les cinq libertés afin d’assurer le bien-être animal». Un soutien généreux de la campagne a été fourni par le commanditaire principal Plus, Boehringer Ingelheim; le commanditaire principal, Petsecure assurance maladie pour animaux; et les commanditaires de programme, iFinance Petcard et Elanco. Un communiqué de presse national a été diffusé la semaine précédant la Semaine de la vie animale. De plus, des communications ciblées pour les médias ont aussi été acheminées aux divers réseaux au pays et elles se sont traduites par de la couverture médiatique. Par ailleurs, l’Agence canadienne d’inspection des aliments a distribué des affiches de la Semaine de la vie animale dans les diverses régions du Canada par l’entremise des ministères et elle a invité l’ACMV à donner deux présentations durant la SVA. Des photos des activités de la Semaine de la vie animale ont été partagées sur la page Facebook de l’ACMV et sur le fil Twitter durant la campagne.

En septembre 2017, l’équipe des communications de l’ACMV a organisé la première rencontre de communications des associations provinciales de médecins vétérinaires (AMV). La rencontre bimestrielle informelle permet à chaque AMV provinciale de partager des projets et des idées et elle représente une occasion de collaboration. Les réunions se poursuivront au cours de 2018.

Des bulletins de masse ont été envoyés par courriel et par télécopieur et les membres ont reçu des mises à jour pertinentes sur les programmes et l’actualité vétérinaire par l’entremise des médias sociaux, d’articles dans les publications provinciales, de renseignements sur le site Web de l’ACMV et du cyberbulletin mensuel de l’ACMV.
2017 CVMA Awards
Prix 2017 de l’ACMV

The 2017 CVMA Awards Ceremony honored exceptional individuals of the veterinary community in July. Dr. David Condon, CVMA Small Animal Practitioner Award (Petsecure Pet Health Insurance); Dr. Anne McDonald, CVMA Humane Award (Merck Animal Health); Dr. Stephen LeBlanc, Merck Veterinary Award (Merck Animal Health); Mona Campbell Centre for Animal Cancer, CVMA Practice of the Year Award (Scotiabank); Dr. Jeanne Lofstedt, CVMA Life Membership; and Dr. Bob Bellamy, CVMA President’s Award. The CVMA extends congratulations to Ms. Elise Wickett who received the 2017 Canadian Registered Animal Health Technician/Veterinary Technician of the Year Award, and Dr. Joseph Ansong-Danquah who received the 2017 Veterinarians Without Borders Volunteer of the Year Award. The CVMA issued individual news releases on each award recipient, which resulted in 17 instances of media coverage.

Science and Knowledge
Leading-edge research, education, news and information that enhances the lifelong learning and career development of members.

Science et connaissances
De la recherche, de la formation, des nouvelles et de l’information de pointe qui améliorent l’apprentissage continu et le développement de la carrière des membres.

Journals 2017
Revues 2017

The Canadian Veterinary Journal (The CVJ) and Canadian Journal of Veterinary Research (CJVR) are the only national, general or multi-species, peer-reviewed veterinary journals in Canada. The number of manuscripts submitted to The CVJ in 2017 was 299; the number submitted to the CJVR in 2017 was 110. Both numbers were up from the year before. Successful efforts are ongoing to reduce the backlog of CVJ manuscripts; the time from submission to publication is now under 12 months, at 11.5. For CJVR the time for the same progression is 9.3 months. Both journals will continue to promote the relevance of journal articles to practice and build demand for the knowledge delivered.

A new associate editor, Dr. Luis Gaitero, joined the journals team in the fall of 2017.
A sponsor was found in 2018 to support a new dermatology feature, which was started earlier in 2017.

Journal representatives met with the deans from 4 of the Canadian veterinary colleges during the CVMA Convention in Charlottetown, Prince Edward Island last July. Topics of discussion included increasing the size of the editorial boards, increasing the pool of peer reviewers, and ensuring that the colleges give appropriate recognition to reviewers and editors.

CVJ editor-in-chief, Dr. Carlton Gyles, attended the meeting of the International Association of Veterinary Editors in Chicago last September and brought back thought-provoking information on models of peer-reviewing, and publication ethics.

The majority of published articles in The CVJ, 51%, come from Canadian authors. In 2017, approximately 72 (59%) articles covered small companion animal content, and 33 (27%) large animal content. The remainder was a combination of articles on pigs, sheep, goats, exotic and other less common species.

The journals department sends an annual letter from the CVMA to the deans of Canadian veterinary schools on behalf of the editors. During academic advancement/tenure considerations, editors are recognized by the schools for their work with the journals.

As a benefit to CVMA members, CVMA authors have lower publication fees for The CVJ and lower page charges for the CJVR. Advertising revenues, which had been on the decline for the last few years due to the pressures on the economy, continue to rebound slowly. Both journals will continue to strive toward a break-even budget.

Readers and CVMA members are reminded that all issues, except the most recent 6 months (The CVJ) and 3 months (CJVR) are available to the public on the PubMed Central archive (www.pubmedcentral.com); a link is also available through the CVMA website (www.canadianveterinarians.net). CVMA members can view the most recent 6 months of The CVJ and most recent 3 months of CJVR on the member-only section of the CVMA website.

Un nouveau rédacteur associé, le Dr Luis Gaitero, s’est joint à l’équipe des revues à l’automne 2017.

En 2018, un commanditaire a été trouvé pour appuyer une nouvelle rubrique sur la dermatologie qui avait été inaugurée plus tôt en 2017.

Les représentants des revues ont rencontré les doyens de quatre des écoles de médecine vétérinaire du Canada lors du congrès de l’ACMV qui s’est déroulé en juillet dernier à Charlottetown, à l’Île-du-Prince-Édouard. Les sujets de discussion incluaient la taille des comités de rédaction, l’élargissement du bassin des lecteurs et la reconnaissance appropriée des lecteurs et des réviseurs par les écoles.

Le rédacteur en chef de La RVC, le Dr Carlton Gyles, a assisté à la rencontre de l’International Association of Veterinary Editors qui s’est tenue en septembre dernier à Chicago et il est revenu avec des idées innovatrices sur les modèles d’évaluation par les pairs et l’éthique de la publication.

La majorité des articles publiés dans La RVC, soit 51 %, proviennent d’auteurs canadiens. En 2017, environ 72 (59 %) des articles traitaient d’un sujet sur les petits animaux de compagnie et 33 (27 %) sur les grands animaux. Le reste du contenu se composait d’articles sur les porcs, les moutons, les chèvres ainsi que sur les animaux exotiques et les espèces plus rares.

Chaque année, le service des revues envoie une lettre aux doyens des écoles de médecine vétérinaire canadiennes, de la part de l’ACMV, au nom des rédacteurs. Le travail des rédacteurs auprès des revues est reconnu par les écoles afin de déterminer l’avancement et la permanence dans les universités.

En tant qu’avantage aux membres de l’ACMV, les auteurs de l’ACMV profitent de tarifs de publication inférieurs pour La RVC ainsi que de frais inférieurs par page pour la RCRV. Les recettes publicitaires, qui avaient connu une baisse au cours des dernières années en raison des pressions économiques, continuent de se redresser. Les deux revues continueront de travailler en vue d’équilibrer le budget.

Nous rappelons aux lecteurs et aux membres de l’ACMV que tous les numéros, sauf pour les six derniers mois (La RVC) et les trois derniers mois (RCRV) sont disponibles au public dans l’archive de PubMed Central (www.pubmedcentral.com); un lien est aussi disponible sur le site Web de l’ACMV (www.veterinairesaucanada.net). Les membres de l’ACMV peuvent visualiser les six plus récents mois des revues dans la section réservée aux membres du site Web de l’ACMV.
Conventions

The Canadian Veterinary Medical Association held its 69th Annual Convention July 13–16 in Charlottetown, Prince Edward Island. Organized in collaboration with the Registered Veterinary Technicians and Technologists of Canada (RVTTC) as well as the Atlantic Veterinary College (AVC), the convention attracted close to 1000 participants.

With over 40 speakers from Canada, the United States, and across the globe, over 125 hours of continuing education (CE) sessions were offered. For the 3rd year, the CVMA submitted the CE sessions for RACE approval. As a result, DVMs were able to earn a maximum of 28 CE credits from a selection of 127 RACE-approved hours.

Approximately 200 participants attended the 2017 CVMA Summit. The theme was *The Future of Veterinary Medicine: Embracing Change & Innovation* and featured Dr. Nick Stace discussing a recent Veterinary Futures study performed by the British Veterinary Association and Royal College of Veterinary Surgeons, and addressed the profession in terms of being in
charge of its future. **Dr. Adam Little** presented areas of rapid change and how the veterinary profession can transform veterinary practice. Finally, **Dr. Caleb Frankel** presented technology in the trenches. The Summit was chaired by president-elect at the time, **Dr. Troye McPherson**.

The Convention provided an opportunity for additional groups and organizations to hold meetings onsite including Christian Veterinary Missions; Veterinarians Without Borders; the RVTTC Annual General Meeting; the Ontario Veterinary College Alumni Reception; and the AVC Alumni Reception.

The CVMA and the AVC worked together to provide 5 wet labs on Thursday, July 13, which included Dental Extractions, Common Surgical Procedures of the Canine Head and Neck, Canadian Hematology, and Equine Dentistry.

In addition to the wet labs, the AVC also hosted the AVC Showcase, which featured 3 unique topics presented by AVC faculty members and was broken down into two 50-minute round-table discussions.

For the 4th year, the CVMA Quest game was part of the mobile app to connect participants with exhibitors, sponsors, CVMA Council, as well as colleagues. Compared to 2016, the app worked offline, which allowed delegates with low Wi-Fi connection the ability to still use the app. New in 2017, this application tool also provided a Live Display, which showcased the agenda, upcoming events, social media alerts/news, Quest leaderboard rankings, and sponsors. Daily draws took place, which gave all app participants the chance to win one of many prizes contributed by all exhibiting companies.

The Saturday evening social event, held at the Lobster on the Wharf, was sold out with over 285 participants. The venue offered breathtaking views of the waterfront. The kitchen-party sans frontières, l’assemblée générale annuelle de TTVAC ainsi que la réception des anciens de l’Ontario Veterinary College et de l’AVC.

L’ACMV et l’AVC ont collaboré afin de présenter les cinq laboratoires de travaux pratiques offerts le jeudi 13 juillet qui incluaient notamment les extractions dentaires, les interventions chirurgicales courantes de la tête et du cou des chiens, l’hématologie canadienne et la dentisterie vétérinaire.

En plus des laboratoires de travaux pratiques, l’AVC a aussi organisé la présentation «AVC Showcase», qui présentait trois sujets uniques soumis par les professeurs de l’AVC et comportait deux tables rondes de 50 minutes.

Le jeu de la Quête de l’ACMV s’est tenu pour la quatrième année et il était intégré à l’appli mobile afin de permettre aux participants d’interagir avec les exposants, les commanditaires, le Conseil de l’ACMV ainsi qu’avec les collègues. Comparativement avec 2016, l’appli fonctionnait hors ligne, ce qui a permis aux délégués qui avait une faible connexion Wi-Fi de toujours pouvoir utiliser l’appli. Pour la première fois en 2017, cet outil d’application permettait aussi une diffusion en direct qui présentait l’ordre du jour, les activités à venir, les alertes des médias sociaux et des nouvelles, le classement des leaders de la Quête et les commanditaires.

Des tirages quotidiens ont eu lieu, ce qui a donné l’occasion à tous les participants de gagner l’un des nombreux prix offerts par les exposants.

Tous les billets ont été vendus pour l’activité sociale du samedi soir qui s’est tenue au restaurant Lobster on the Wharf et plus de 285 délégués y ont participé. Le restaurant offrait des vues éblouissantes sur la mer. L’activité sur le thème d’un party de cuisine a remporté beaucoup de succès et les billets étaient tous vendus avant la fermeture de l’inscription hâtive. Vétérinaires
themed event was a success and sold out prior to the early bird registration closing. Veterinarians Without Borders held a live auction and guests were entertained by Courtney Hogan and the Fiddlers Sons.

The CVMA is grateful to the 32 sponsors of the Convention, especially the Level 1 sponsors: Boehringer-Ingelheim, Merck Animal Health, Virox Animal Health, and Western Financial Group Insurance Solutions. The exhibit hall was filled to capacity with over 70 booths and 12 table tops.

Canadian Veterinary Reserve (CVR)
Réserve vétérinaire canadienne (RVC)

The mandate of the CVMA’s CVR is to provide veterinary surge capacity resources to first-responders in case of large-scale emergencies involving animals, in order to address animal health and welfare. The CVR serves emergency first responders such as the Canadian Food Inspection Agency (CFIA) in case of foreign animal diseases or provincial emergency management offices and/or chief veterinary offices in case of civil emergencies such as floods, earthquakes, wild-fires or in case of non-reportable diseases.

With 288 reservists, the CVR has surpassed the threshold of 200 reservists as agreed upon with first responders, but applications are welcome on an ongoing basis. The annual call-up drills have proven that the CVR has the ability and capacity to call up reservists within a short period of time (24–48 hours).

Training: The CVR now hosts 16 civil emergency training modules on its website.

Wildfires in British Columbia: In August 2017, Emergency Management BC approached the CVMA to inquire about the readiness of the CVR for a call-up and deployment of reservists to provide emergency care for animals (mainly cattle) affected by more than 1000 wildfires. Emergency Management BC signed the service agreement with the CVMA; however, as domestic capacity to cope with the development of the fires was not surpassed, deployment never became necessary.

“Beyond the Border”: The Public Health Agency of Canada engaged the CVR in the United States — Canada emergency management concept, which aims to provide reciprocal cross-border assistance in case of emergencies affecting humans and/or animals.

The CVR continues to seek opportunities to engage reservists in exercises held by first responders (provincial or federal governments), as well as to explore collaboration with the Canadian Red Cross.

La RVC a pour mandat de fournir des ressources vétérinaires d’appoint aux premiers intervenants dans l’éventualité de situations d’urgence à grande échelle touchant les animaux et afin de gérer les enjeux liés à la santé et au bien-être des animaux. La RVC dessert les premiers intervenants comme l’Agence canadienne d’inspection des aliments (ACIA) et/ou les médecins vétérinaires en chef en cas d’urgences civiles, comme des inondations, des tremblements de terre, des feux de brousse ou en cas de maladies ne prétendant pas à déclaration obligatoire.

 Avec ses 288 réservistes, la RVC a dépassé le seuil des 200 réservistes prévu en tant que premiers intervenants, mais des demandes sont toujours acceptées. Les exercices annuels de mobilisation ont confirmé le fait que la RVC possède la capacité de mobiliser des réservistes à courte échéance (de 24 à 48 heures).

Formation: La RVC héberge 16 modules de formation sur les urgences civiles sur son site Web.

Feux de brouss en Colombie-Britannique : En août 2017, Emergency Management BC a approché l’ACMV pour lui renseigner sur la mobilisation et le déploiement de réservistes afin d’offrir des soins d’urgence pour les animaux (surtout le bétail) affectés par plus de 1000 feux de brousse. Emergency Management BC a signé une entente de service avec l’ACMV. Cependant, vu que la capacité intérieure pour gérer l’évolution des incendies n’a pas été dépassée, le déploiement n’a pas été nécessaire.

 «Par-delà la frontière» : L’Agence de la santé publique du Canada a engagé la RVC dans le cadre du concept de gestion des urgences États-Unis — Canada qui vise à fournir de l’assistance transfrontalière réciproque en cas d’urgences touchant les humains et/ou les animaux.

La RVC continue de rechercher des occasions afin d’intégrer les réservistes lors d’exercices tenus par les premiers intervenants (gouvernements provinciaux ou fédéral) ainsi que d’explorer une collaboration avec la Croix-Rouge canadienne.
Business Management

Gestion commerciale

In 2017, the CVMA continued its benchmarking program that included valuable economic and practice management tools and resources such as provincial suggested fee guides, compensation and benefits reports for associate veterinarians, non-DVM wage reports, provincial economic reports, and individual practice reports. The data in these reports come from the annual economic surveys the CVMA conducts in partnership with the provincial veterinary medical associations and program co-sponsors, Idexx Laboratories, Petsecure, Merck Animal Health and Scotiabank.

The CVMA and Association des médecins vétérinaires du Québec en pratique des petits animaux (AMVQ) collaborated to deliver the 2017 economic survey of small animal practitioners in Québec, which provided added value to CVMA members.

In 2017, the CVMA published 6 veterinary practice management articles in The CVJ, which are also posted on the CVMA website’s Business Management Program section.

In Charlottetown, Prince Edward Island, the 2017 CVMA Convention’s Business Management track, “A Successful Career, a Balanced Life,” was six 50-minute sessions. Dr. Ernie Ward discussed physical exam hacks, steps to cure conflict, innovating the first year, training as a team, refueling the energy slump, and making clinics happier.

Provincial veterinary medical associations’ representatives attended the annual Economic Forum, held during CVMA’s Convention, and were provided with the scheduling and delivery of annual surveys and reports to all members. Mr. Darren Osborne, the CVMA’s economic consultant, presented national data comparisons and discussed potential improvements to the program and its delivery.

En 2017, l’ACMV a continué d’offrir son programme d’évaluation comparative du rendement qui comprenait des outils et des ressources utiles pour la gestion des finances et de la pratique, comme les guides tarifaires suggérés provinciaux, les rapports sur la rémunération et les avantages sociaux des vétérinaires salariés, les rapports sur les salaires des employés non-vétérinaires, les rapports économiques provinciaux et les rapports individuels des pratiques. Les données utilisées dans ces rapports proviennent des sondages économiques annuels réalisés par l’ACMV en partenariat avec les associations provinciales de médecins vétérinaires et les cocommanditaires de programme Idexx Laboratories, Petsecure, Merck Santé animale et la Banque Scotia.

L’ACMV et l’Association des médecins vétérinaires du Québec en pratique des petits animaux (AMVQ) ont collaboré pour la livraison du sondage économique 2017 auprès des praticiens pour petits animaux du Québec, ce qui a offert de la plus-value aux membres de l’ACMV.

En 2017, l’ACMV a publié six articles sur la gestion commerciale d’une pratique vétérinaire dans La RVC qui peuvent aussi être consultés dans la section du Programme de la gestion commerciale du site Web de l’ACMV.

À Charlottetown, à l’Île-du-Prince-Édouard, le volet sur la gestion commerciale du congrès de l’ACMV, «Une carrière prospère, une vie équilibrée», offrait six ateliers de 50 minutes. Le Dr Ernie Ward a discuté des astuces pour les examens physiques, des étapes pour régler le conflit, de l’innovation lors de la première année, de la formation en équipe ainsi que des façons de faire le plein d’énergie pour lutter contre l’épuisement et des conseils pour égayer l’ambiance des cliniques.

Les représentants des associations provinciales de médecins vétérinaires (AMV) ont assisté au Forum économique annuel, qui s’est tenu durant le congrès de l’ACMV et où l’on a présenté un aperçu du calendrier et de la livraison des sondages et des rapports annuels à tous les membres. M. Darren Osborne, le consultant économique de l’ACMV, a présenté les comparaisons des données nationales ainsi que des améliorations potentielles au programme et à sa mise en œuvre.
Health and Wellness of Veterinarians
Santé et bien-être des vétérinaires

The CVMA created a web section dedicated to Veterinarian Health and Wellness Resources. These resources are categorized under 3 key areas: emotional and mental health, physical health, and veterinarian wellness. A rotating banner pointing directly to the web section is permanently placed on the CVMA homepage for ease of access. Resources continue to be added as they are identified.

Under the CVMA Insurance Program, employees enrolled in the group health benefits plan have access to professional referral services and employee assistance services offered as optional added benefits of the plan.

The CVMA undertook a survey of provincial veterinary associations (VMAs) and regulatory bodies to obtain information about their respective provincial member wellness programs, the types of services offered, the cost to offer such programs, and some aggregate usage statistics. The information received was compiled and shared with the VMAs and brought forward for further discussion in 2017.

To support the health and wellness of its members, the CVMA negotiated a corporate membership discount with GoodLife Fitness.

CVMA Web Store Program — ‘MyVetStore.ca’
Programme de vitrine en ligne de l’ACMV — «MaVitrineVétérinaire.ca»

In 2017, the CVMA added 11 new member clinics to the CVMA Web Store Program. Sales flowing through the web store across the country have increased 60% compared to 2016 and some clinics have introduced the wellness plan billing module. A new Pet Food Manufacturer's Rebate Program was also introduced, which provides an instant rebate on your clients’ pet food purchases ordered through the Webstore's Auto Order feature.

The MyVetStore.ca is a customizable online retail platform branded to your practice, offering your clients the ease and convenience of purchasing their pet’s prescription products and dietary recommended products directly from you. You control what products are available and the pricing. You can also set up automatic ordering to fill recurring orders for those clients you have registered to have access to your web store.

L’ACMV a créé une section du site Web consacrée aux Ressources pour la santé et le bien-être des vétérinaires. Ces ressources se classent dans trois grands domaines : santé mentale et bien-être psychologique, santé physique et bien-être des vétérinaires. Pour un accès facile, une bannière rotative pointant directement vers la page du bien-être a été placée de façon permanente sur la page d’accueil de l’ACMV. Des ressources continuent d’être ajoutées au fur et à mesure qu’elles sont identifiées.

En vertu du Programme d’assurance de l’ACMV, les employés inscrits au régime d’avantages sociaux de groupe ont accès à des services professionnels spécialisés et à des services d’assistance aux employés offerts en tant qu’avantage supplémentaire du régime.

L’ACMV a effectué un sondage auprès des associations provinciales de médecins vétérinaires et des organismes de réglementation afin d’obtenir des renseignements à propos des programmes de bien-être des membres provinciaux respectifs, du type de services offerts, du coût de la prestation de ces programmes ainsi que de recueillir certaines statistiques d’utilisation globales. Les renseignements reçus ont été compilés et communiqués aux AMV et ils ont fait l’objet de nouvelles discussions en 2017.

Afin d’appuyer la santé et le bien-être de ses membres, l’ACMV a négocié un rabais d’entreprise avec GoodLife Mise en forme.
Without a reason to buy pet products elsewhere, the web store can help promote better client compliance, while increasing sales without the cost and hassle of stocking inventory.

The CVMA Web Store Program is configured to meet the respective provincial veterinary regulations and guidelines. The CVMA has negotiated the most favorable financial terms for its members.

CVMA Group Insurance Program

Programme d’assurance de groupe de l’ACMV

Professional Liability and Commercial “Protected Self-Insurance” Program (PSIP)
In 2017, the Program insured 1516 participants. The PSIP model is the greatest selling feature and utilizes a “protected self-insurance” retention fund to enable participating members to take partial ownership of their insurance costs. Participants are provided with a comprehensive review of their business operations and a policy tailored to meet the specific needs of the practice. Members also save a minimum 10% for equivalent coverage when joining the Commercial or Employee Group Benefits Program.

Employee Group Benefits Program (EGBP)
In 2017, participation increased by 12%, with new business sales achieved throughout the year. The EGBP offers flexible options to clinics for comprehensive life, health and dental plans, accidental death and dismemberment, and disability. Optional wellness benefits such as professional referral and counseling services for insured members and family members, and business assistance and coaching for the practice are also available. Insured clinics benefit from the rate stability generated by spreading claims over the entire TotalGUARD™/CVMA pool.

Other insurance solutions available under the CVMA Group Insurance Program include affinity program, veterinary student & graduate program, personal automobile, home and travel insurance.

Programme de responsabilité professionnelle et d’assurance auto-protégée commerciale
En 2017, le programme a assuré 1516 participants. Le modèle de l’assurance auto-protégée est le principal avantage offert et fait appel à un fonds de rétention d’assurance auto-protégée qui permet aux membres participants d’assumer une propriété partiel de leurs coûts d’assurance. On offre aux participants un examen complet leurs activités et une police qui est conçue spécifiquement pour répondre aux risques de leur pratique. De plus, les membres économisent en moyenne 10 % pour une couverture équivalente lorsqu’ils adhèrent au programme d’assurance commerciale et d’avantages sociaux pour les employés.

Programme collectif d’avantages sociaux pour les employés
En 2017, la participation au programme a augmenté de 12 % et de nouvelles polices ont été vendues tout au cours de l’année. Le Programme collectif d’avantages sociaux offre des options flexibles en matière de protection d’assurance vie, maladie et dentaire, d’assurance en cas de décès et de mutilation par accident et d’assurance invalidité. Des avantages facultatifs relatifs au bien-être, comme les services d’aiguillage professionnel et le counselling pour les membres assurés et les membres de la famille, ainsi qu’une assistance et un encadrement d’affaires pour la pratique, sont également offerts. Les cliniques assurées profitent de la stabilité des tarifs garantie par l’étalonnage des réclamations sur l’ensemble du bassin TotalGUARDMD/ACMV.

Initiatives for Early Career DVMs

The CVMA has developed initiatives to support new veterinarians, help meet their personal and professional needs, and ease their financial burden as they settle in their new profession.

Membership dues reduction
New graduates receive a complimentary membership for the remainder of the year in which they graduate. Individuals who maintain their membership after graduation throughout a consecutive 3-year period are eligible for a 75%–50%–25% tiered fee reduction. Members in their first year following graduation also receive a complimentary general registration to the CVMA Convention — a great opportunity to enhance their skills and knowledge.

CVMA Mentoring Program
In 2017, 37 mentors and 14 mentees were registered in the program. The program is open to CVMA members and the CVMA acts as facilitator by providing mentees access to a roster of mentors on the CVMA website. Mentees can self-search a potential mentor and initiate communication directly whenever they are ready to do so. A mentoring guide and FAQs document are available online to help prospective mentors and mentees.

“What Can’t Be Taught” articles
A series of articles, written by members of the CVMA Emerging Leaders Network, provides insight into the first years in practice and offers advice from someone “who’s been there.” Six articles were submitted and published in The CVJ in 2017. The articles are also posted on the member website in the Mentoring Resources section.

CVMA Emerging Leaders Program (ELP)
In its 8th year, the 2017 CVMA Emerging Leaders Program welcomed 37 participants from across Canada. The participants included 19 selected ELP candidates sponsored by CVMA/VMAs; 5 students sponsored by CVMA; and 10 paid participants. The ELP is a highly interactive 8-hour workshop spread across 2 half-days during which participating veterinarians and veterinary technologists gain insight into how best to lead themselves as individuals, how to communicate with those around them, and ultimately how this knowledge can better prepare them to lead those around them.

L’ACMV a élaboré des initiatives afin d’appuyer les nouveaux vétérinaires, d’aider à répondre à leurs besoins personnels et de soulager leur fardeau financier tandis qu’ils s’installent dans leur nouvelle profession.

Réduction de la cotisation
Les finissants reçoivent une adhésion gratuite pour le reste de l’année au cours de laquelle ils ont obtenu leur diplôme. Les personnes qui conservent une adhésion après la fin des études pendant une période consécutive de trois années sont admissibles à une réduction progressive de la cotisation de 75 %–50 %–25 %. De plus, dans l’année suivant l’obtention du diplôme, les membres obtiennent aussi une inscription générale gratuite au congrès de l’ACMV, ce qui représente une excellente occasion de perfectionner leurs compétences et leurs connaissances.

Programme de mentorat de l’ACMV
En 2017, 37 mentors et 14 mentorés étaient inscrits au programme. Ce programme est ouvert aux membres de l’ACMV et l’ACMV agit en tant que facilitateur qui offre aux mentorés l’accès à un groupe de mentors sur le site Web de l’ACMV. Les mentorés peuvent chercher eux-mêmes un mentor éventuel et initier la communication directement lorsqu’ils sont prêts à commencer. Un guide de mentorat et une FAQ sont disponibles en ligne afin d’aider les nouveaux mentors et les mentorés.

Articles «Ce qui ne s’enseigne pas»
Une série d’articles, rédigés par les membres du Réseau des futurs leaders de l’ACMV, permet de jeter un coup d’œil sur les premières années de pratique et offre des conseils provenant de personnes qui ont déjà vécu ces types de situations. Six articles ont été soumis et publiés dans La RVJ en 2017. Les articles ont aussi été affichés sur le site Web des membres dans la section des Ressources de mentorat.

Programme des futurs leaders (PFL)
Le Programme des futurs leaders 2017, qui en était à sa huitième année, a accueilli 37 participants de toutes les régions du Canada. Les participants incluaient 19 candidats du PFL choisis et commandités par l’ACMV et les AMV; cinq étudiants commandités par l’ACMV, ainsi que dix participants payants. Le PFL est un atelier hautement interactif d’une durée de huit heures réparties sur deux demi-journées durant lequel les vétérinaires et les technologues vétérinaires participants apprennent comment devenir de meilleurs leaders en tant que personnes, comment communiquer avec les personnes qui les entourent et comment ces connaissances leurs permettront d’être mieux préparés à diriger les personnes autour d’eux.
Early Career DVM Resource Hub

To support early career DVMs and help set them on the path to a successful career, the CVMA created a dedicated website section containing useful information, tools and resources related to financial planning and budgeting, communications and career development. Some examples of these tools and resources include student loan repayment estimators, a budgeting app for mobile devices, guidelines for successful employment, and instructional communications videos. Additional resources continue to be added as they are identified.

VALUE OF MEMBERSHIP

Membership

As the national professional association, the CVMA has supported and advanced the interests of Canada's veterinarians and provided leadership by tackling issues that may affect the daily practice of veterinary medicine. The Association’s strength is in influencing policy decisions that matter most to the profession, sharing veterinary science and knowledge, and providing services and resources to help meet the needs of members. In 2017, 7111 veterinarians and veterinary student members supported CVMA’s work and leadership.

The CVMA is always looking to deliver more value to members to improve their professional success, and personal and financial wellbeing. Members can take advantage of the broadest suite of benefits available, including practice tools and resources, position statements and research, continuing education, powerful advocacy and a wide array of discounts and savings.

Below are some of the new tangible member benefits and services introduced in 2017. A full listing of all available member benefits and services is also published in each issue of The CVF near the front.

HRdownloadsTM: CVMA partnered with HRdownloads™ to provide members with discounted human resource management services, resource documentation, live HR support by senior HR advisors, online surveys, policy manual development, job description generator, employee performance review, and online training solutions. Plus, CVMA members receive a complimentary human resources document bundle!

GoodLife Fitness™: One new CVMA health and wellness initiative is the CVMA-GoodLife Fitness Corporate Discount

Carrefour des ressources pour les vétérinaires en début de carrière

Afin de mieux appuyer les vétérinaires en début de carrière et de faciliter le lancement d’une carrière prospère, l’ACMV a créé une section réservée du site Web contenant des renseignements utiles, des outils et des ressources portant sur la gestion du budget et des finances personnelles, les communications et l’évolution de carrière. Ces outils et ces ressources incluent notamment des calculatrices pour le remboursement des prêts étudiants, une appli de budgétisation pour les appareils mobiles, des directives pour l’emploi des finissants et des vidéos éducatives sur la communication. Des ressources additionnelles continuent d’être ajoutées au fur et à mesure qu’elles sont identifiées.

VALEUR DE L’ADHÉSION

Effectif

À titre d’association professionnelle nationale, l’ACMV a appuyé et fait progresser les intérêts des médecins vétérinaires du Canada et elle a assuré le leadership en s’attaquant à des enjeux qui affectent l’exercice quotidien de la médecine vétérinaire. La force de l’Association consiste à influencer les décisions politiques qui comptent le plus pour la profession, à partager les sciences et les connaissances vétérinaires et à offrir des services et des ressources pour répondre aux besoins des membres. En 2017, 7111 vétérinaires et membres étudiants ont appuyé le travail et le leadership de l’ACMV.

L’ACMV recherche toujours de nouvelles façons d’offrir plus de valeur aux membres afin d’améliorer leur succès professionnel ainsi que d’accroître leur rentabilité et leur succès professionnel. Les membres peuvent profiter du plus vaste éventail d’avantages offerts, dont des outils et des ressources pour la pratique, des énoncés de position et de la recherche, de la formation continue, une puissante défense des intérêts ainsi qu’une vaste gamme de rabais et de réductions.

Voici quelques-uns des nouveaux avantages et services aux membres qui ont été introduits en 2017. Une liste complète de tous les avantages et services offerts aux membres est publiée dans chaque numéro de La RV/C, au début de la publication.

HRdownloadsMD: L’ACMV a formé un partenariat avec HRdownloadsMD afin d’offrir aux membres des services de gestion des ressources humaines à prix réduit, de la documentation, un soutien en direct sur les RH offert par des conseillers en RH chevronnés, des sondages en ligne, l’élaboration d’un manuel des politiques, un générateur de descriptions de travail, l’examen du rendement des employés et des solutions de formation en ligne. De plus, les membres de l’ACMV reçoivent gratuitement une trousse sur les ressources humaines!

GoodLife Mise en formeMD: Le Programme de rabais d’entreprise ACMV-GoodLife Mise en forme est une nouvelle initiative de l’ACMV en matière de santé et de bien-être à l’intention des membres de l’ACMV. L’ACMV a négocié un rabais d’entreprise qui permet aux membres d’économiser jusqu’à 44 % sur les tarifs d’abonnement individuels.

PetcardMD: Le Programme PetcardMD de l’ACMV fournit aux membres des options de financement pratiques et abordables
Program for CVMA members. The CVMA negotiated a corporate membership that can save members up to 44% off regular individual membership rates.

**Petcard®**: The CVMA-Petcard® Program provides members with convenient and affordable financing options you can offer your clients to finance treatments or products their pet needs. The CVMA Petcard® Program and its exclusive special benefits, incentives, and rewards are only available to practices owned in whole or in part by CVMA members.

**MonerisMD**: The CVMA and Moneris have partnered to provide members with preferred pricing on debit and credit card merchant payment processing. These preferred rates are only available to practices owned in whole or in part by CVMA members.

**Mont-Tremblant SkiMax**: The CVMA negotiated the best rates for its members to enjoy the slopes of Mont-Tremblant through the corporate SkiMax program. Members save as much as 39% on the price of adult lift tickets.

**Career and Business Toolkit**: This web section of the CVMA business management program provides easy access to pertinent online resources and information on financial and practice management, human resources management, and marketing and communications.

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**Students of the Canadian Veterinary Medical Association (SCVMA)**

The Students of the Canadian Veterinary Medical Association (SCVMA) represents over 1600 DVM students from the 5 Canadian veterinary colleges.

The successful, student-run 2017 SCVMA Symposium, held January 20 and 21 at the University of Calgary — Faculty of Veterinary Medicine, had 202 students in attendance.

**Dr. Temple Grandin** attended as the event’s keynote speaker.

The SCVMA conducted its annual *New Graduate Survey*, gathering useful data for future veterinary graduates and the profession. The survey report was published in *The CVJ*’s May issue and posted in the SCVMA website section.

The SCVMA members received the annual *VetRap* student newsletter, featuring articles from each college, and 2 student e-newsletters. Throughout the year, the SCVMA Facebook group provides information updates.

First-year students received CVMA-branded lab coats and name badges during each college’s welcome ceremony and the CVMA and Teacher of the Year Awards were presented at their awards ceremony.

In the fall at each college, a CVMA Council representative and the SCVMA Committee representative gave the CVMA *One Voice* presentation, introducing students to the CVMA and led a current animal welfare or national veterinary issue discussion.

In the winter at each college, CVMA’s insurance partner, Western Financial Group Insurance Solutions, presented an overview of career insurance risks students may face and explained available insurance products and coverages.

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Les Étudiants de l’Association canadienne des médecins vétérinaires (ÉACMV) représentent plus de 1600 étudiants en médecine vétérinaire dans les cinq collèges de médecine vétérinaire du Canada.

Le Symposium 2017 des ÉACMV, qui a été un événement réussi organisé par des étudiants, s’est déroulé les 20 et 21 janvier à la Faculté de médecine vétérinaire de l’Université de Calgary et 202 étudiants y ont participé. La Dr Temple Grandin y était présente à titre de conférencière invitée.

Les ÉACMV ont réalisé leur *Sondage annuel auprès des finissants* afin de recueillir des données utiles pour les futurs diplômés en médecine vétérinaire et la profession. Le rapport sur le sondage a été publié dans le numéro de mai de *La RVC* et affiché dans la section du site Web des ÉACMV.

Les membres des ÉACMV ont reçu le bulletin étudiant annuel *VetRap* qui contient des articles provenant de chacun des collèges ainsi que deux cyberbulletins étudiants. Pendant l’année, le groupe Facebook des ÉACMV présentent aussi des mises à jour.

Les étudiants de première année ont reçu leurs sarraus et des insignes d’identité affichant le logo de l’ACMV lors de la cérémonie d’accueil tenue à chacun des collèges et les Prix de l’ACMV et les Prix de l’enseignant de l’année ont aussi été décernés à leur cérémonie de remise des prix.

À l’automne, à chaque collège, un représentant du Conseil de l’ACMV et le représentant du Comité des ÉACMV ont donné la présentation *Une voix* de l’ACMV afin d’introduire les étudiants à l’ACMV et de mener une discussion sur une
In 2017, the CVMA continued the international student affiliation program and had 7 participating schools: St. George’s University — School of Veterinary Medicine; College of Veterinary Medicine — Western University of Health Sciences; The Royal (Dick) School of Veterinary Studies — The University of Edinburgh; Sydney School of Veterinary Science — The University of Sydney; the School of Veterinary and Life Sciences — Murdoch University; the University of Glasgow School of Veterinary Medicine; and Kansas State University, totaling 118 international veterinary student affiliate members.

The 2nd annual Student Leadership Workshop (SLW), held at the Ontario Veterinary College November 11, 2017, had 77 student participants. This interactive workshop, led by Dr. Rick DeBowes, titled, “Experiential Leadership Programming: The First Step in Being Our Best Selves,” offered personal and career development strategies students may not learn in school.

Les représentants du Comité des ÉACMV avec la Dre Temple Grandin (extrême gauche).
Student Liaison Advisory Group
The CVMA Student Liaison Advisory Group (SLAG) represents the CVMA at each of the 5 Canadian veterinary colleges, strengthening the CVMA and veterinary student link. The SLAG, comprised of 1 faculty member from each college, guides their college's SCVMA Committee representative and participates in annual CVMA initiatives including the One Voice presentation, lab coat ceremony, and the SCVMA Symposium.

CVMA-SBCV Chapter Annual Report Covering 2017
Rapport annuel de la Section de l'ACMV-SBCV portant sur 2017

Policy and Advocacy
The Animal Welfare Committee of the CVMA-SBCV Chapter has been able to delve in-depth into specific issues such as the public posters for display in member clinics on issues like Poisoning Prevention, Recognizing Signs of Pain, and Managing Noise Phobias in Pets. The Chapter continues to collaborate with the College of Veterinarians of British Columbia (CVBC) on issues of mutual importance. The Chapter is able to quickly gather input and make presentations or statements to members on relevant and timely topics. A quick response team (QRT) was developed to help support the Chapter Board with knowledge in response to specific issue management and media requests. The Chapter opened a dialogue with the Ministry of Agriculture.

Science and Knowledge
With the CVMA-SBCV Chapter's expanded committee structure, it has been able to broaden the continuing education (CE) and magazine offerings, as well as introduce new animal welfare activities.

The CE Committee organized, in 2017, a 4-city, 4-date-4-speaker Regional Spring CE Seminar to be held in 2018, in Abbotsford, Nanaimo, Kelowna, and Nelson. The seminar

Chapter Vice President Dr. Al Longair presents a copy of the article on Olive, BC’s Unofficial First Dog to the Lieutenant Governor of British Columbia, Her Honor Judith Guichon.

Le vice-président de la Section, le Dr Al Longair, présente un exemplaire de l’article sur Olive, le Premier chien non officiel de la Colombie-Britannique, à la lieutenante-gouverneure de la Colombie-Britannique, l’honorable Judith Guichon.

Políticas y defensa de los intereses
Le Comité sur le bien-être animal de la Section de l’ACMV-SBCV a approfondi des enjeux spécifiques comme des affiches publiques pour les cliniques membres portant sur des enjeux comme la prévention de l’empoisonnement, la reconnaissance des signes de douleur et la gestion des phobies liées au bruit chez les animaux de compagnie. La Section continue de collaborer avec le College of Veterinarians of British Columbia (CVBC) sur des questions d’importance mutuelle. La Section peut rapidement recueillir de la rétroaction et présenter des exposés ou communiquer des déclarations aux membres sur des sujets pertinents et opportuns. Une équipe d’intervention rapide a été mise sur pied afin d’appuyer le conseil d’administration de la Section et de lui fournir des connaissances afin de répondre à des enjeux de gestion spécifiques et aux questions de la part des médias. La Section a aussi entamé un dialogue avec le ministère de l’Agriculture.

Science et connaissances
La Section de l’ACMV-SBCV, en s’appuyant sur sa structure élargie de comités, a pu bonifier son programme de formation continue et son éventail de revues ainsi qu’introduire de nouvelles activités en matière de bien-être animal.

En 2017, le Comité de la formation continue a organisé un colloque régional de quatre villes, quatre dates, quatre conférenciers qui se déroulera au printemps 2018 à Abbotsford, à Nanaimo, à Kelowna et à Nelson. Le colloque a été conçu afin d’offrir de la formation continue aux membres des diverses régions de la province. La Conférence d’automne de Vancouver a été élargie afin d’offrir 14 crédits de formation continue et elle a présenté la Dra Miranda Sadar (médecine exotique), la Dra Shea Cox (gestion de la douleur chronique chez les animaux gériatriques), la Dra Kathleen Cooney (médecine de fin de vie),
was designed to bring CE to members province-wide. The Vancouver Fall Conference was expanded to 15 CE credit hours and featured Dr. Miranda Sadar (exotic medicine), Dr. Shea Cox (chronic pain management in geriatric pets), Dr. Kathleen Cooney (hospice medicine), Dr. Marco Cervi (surgery), and Dr. David Lane (canine sports medicine and rehab).

The Editorial Committee expanded the magazine *West Coast Veterinarian* to 44-pages in response to a demand for greater content. The Committee also introduced additional columns such as the Wildlife and supplementary Animal Welfare columns.

The Animal Welfare Committee (AWC) provided input into CVMA position statements (new or revised) and consulted on provincial issues. AWC members attended conferences on animal cruelty and animal behavior and disseminated that information through written articles.

**Practice and Economics**
The Chapter encouraged member participation in the practice owner's economic survey and other compensation and benefits surveys done through the CVMA Business Management Program and promoted these as a key benefit of membership. A BC-specific solution to classified ads was introduced in response to a specific request for us to do so. A Chapter member window decal was designed to help build recognition of the CVMA-SBCV Chapter brand, and other branded items.

**Pratique et finances**
La Section a encouragé la participation des membres au sondage économique auprès des propriétaires de pratique et aux autres sondages sur la rémunération et les avantages sociaux réalisés par l’entremise du Programme de gestion commerciale de l’ACMV et elle a fait la promotion de ces outils qui représentent un précieux avantage de l’adhésion. Une solution adaptée à la Colombie-Britannique pour les petites annonces a été introduite en réponse à une requête spécifique qui nous avait été communiquée. Un décalque de fenêtre a été conçu pour les membres de la Section afin de rehausser l’image de marque de la Section ACMV-SBCV de même que d’autres articles arborant le logo de la Section.

**SETTING STANDARDS**
*Veterinary Technician and Technologist Program Accreditation*

**ÉTABLISSEMENT DE NORMES**
Agrément des programmes de technologie et de techniques vétérinaires

Veterinary technicians and technologists are important members of the veterinary team. Through its Animal Health Technician/ Veterinary Technician Accreditation Program, the CVMA strives to ensure education and training standards that qualify personnel to join the veterinary health care team. Graduates of such accredited programs benefit by having their competence recognized and prospects for employment and mobility enhanced; veterinary teams benefit from well-trained technicians and technologists.

The CVMA maintains a reciprocity agreement with the American Veterinary Medical Association (AVMA), which allows for the mutual recognition of the respective accreditation processes.

In 2017, site visits to University of Guelph — Ridgetown Campus, St. Lawrence College, Douglas College and Thompson Rivers University took place.

The 19 accredited programs in Canada are:
- Algonquin College, Ottawa, Ontario
- Dalhousie University (formerly Nova Scotia Agricultural College), Truro, Nova Scotia
- Douglas College, New Westminster, British Columbia
- Georgian College, Orillia (Ontario)
- Rivers University took place.
- Georgias College, New Westminster, British Columbia
- Douglas College et à l’Université Thompson Rivers.
- lgonquin College, Ottawa, Ontario
- Douglas College, New Westminster, British Columbia

Le D’ Marco Cervi (chirurgie) et le D’ David Lane (médecine sportive et réadaptation canines).

Le Comité de la rédaction a élargi le contenu du magazine *West Coast Veterinarian* à 44 pages en réponse à la demande. Le comité a aussi introduit de nouvelles rubriques dont une sur la faune et des chroniques complémentaires sur le bien-être animal.

Le Comité sur le bien-être animal (CBA) a communiqué de la rétroaction sur les énoncés de position de l’ACMV (nouveaux ou révisés) et a été consulté sur des enjeux provinciaux. Les membres du CBA ont assisté à des conférences sur la cruauté envers les animaux et le comportement animal et ont disséminé ces renseignements dans le cadre d’articles.

Les techniciens et technologues vétérinaires sont des membres importants de l’équipe vétérinaire. Par l’entremise du Comité d’agrément des programmes de technologie et de techniques vétérinaires (CAPTTV), l’ACMV travaille afin de garantir des normes d’éducation et de formation qui permettront au personnel de se qualifier afin de se joindre à l’équipe de soins vétérinaires. Les diplômés de ces programmes agréés profitent du fait que leur compétence est reconnue et que leurs perspectives d’emploi et de mobilité sont améliorées et l’équipe vétérinaire profite de techniciens et de technologues bien formés.

L’ACMV maintient une entente de réciprocité avec l’American Veterinary Medical Association (AVMA) qui permet la reconnaissance mutuelle de nos processus d’agrément respectifs.

En 2017, des inspections ont eu lieu à l’Université de Guelph — Campus Ridgetown, à St. Lawrence College, à Douglas College et à l’Université Thompson Rivers.

Les 19 programmes agréés au Canada sont les suivants :
- Algonquin College, Ottawa (Ontario)
- Douglas College, New Westminster (Colombie-Britannique)
National Exams
Examens nationaux

As an “at arms-length” operating Board of the CVMA, the National Examining Board (NEB) administers the exams for Canadian graduates and internationally trained veterinarians who wish to practice in Canada. By passing the required exams, the candidates obtain a Certificate of Qualification (CQ), which makes them eligible to apply for licensure in any jurisdiction in Canada. The ultimate decision for licensure remains with the provincial regulatory bodies.

The NEB works closely with its counterparts in the United States, namely the AVMA’s Educational Commission for Foreign Veterinary Graduates (ECFVG) as well as the International Council for Veterinary Assessment (ICVA) to ensure that the examination process remains relevant and fair. This collaboration provides as well for recognition of the CQ by most of the States.

NEB examination process
In 2017, the NEB accepted applications from 310 new candidates and issued 551 CQs (332 Canadian students, 121 graduates from AVMA-accredited veterinary schools and 98 graduates of non-accredited veterinary schools).
Veterinary College Accreditation

Agrément des collèges de médecine vétérinaire

The CVMA, in collaboration with the American Veterinary Medical Association — Council on Education (AVMA-COE), accredits university programs designed to educate students to become veterinarians. All Canadian veterinary colleges are AVMA/CVMA-COE accredited.

In 2017 AVMA/CVMA-COE site visits were conducted at:
• University of Illinois
• Lincoln Memorial University
• University of Alaska
• Oklahoma State University
• Kansas State University
• University of Prince Edward Island
• University of Saskatchewan
• Washington State University
• Iowa State University
• Cornell University

L’ACMV, en collaboration avec l’American Veterinary Medical Association — Council on Education (AVMA-COE), procède à l’agrément des programmes universitaires conçus pour former les étudiants à devenir des médecins vétérinaires. Tous les collèges de médecine vétérinaire canadiens sont agréés par l’AVMA/ACMV-COE.

En 2017, des inspections de l’AVMA/ACMV-COE ont été réalisées dans les établissements suivants:
• Université de l’Illinois
• Université Lincoln Memorial
• Université d’Alaska
• Université de l’État de l’Oklahoma
• Université de l’État du Kansas
• Université de l’Île-du-Prince-Édouard
• Université de la Saskatchewan
• Université de l’État de Washington
• Université de l’État de l’Iowa
• Université Cornell
INDEPENDENT AUDITORS’ REPORT

To the Members,

Canadian Veterinary Medical Association:

We have audited the accompanying financial statements of the Canadian Veterinary Medical Association, which comprise the statements of financial position as at December 31, 2017, and the statement of changes in net assets, operations and cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management’s responsibility for the financial statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian accounting standards for not-for-profit organizations, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditors’ responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor’s judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers the controls relevant to the preparation of financial statements that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity’s internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Canadian Veterinary Medical Association as at December 31, 2017, and the results of its operations and its cash flows for the year then ended in accordance with Canadian accounting standards for not-for-profit organizations.

OUSELEY HANVEY CLIPSHAM DEEP LLP
Licensed Public Accountants

Ottawa, Ontario
April 23, 2018

RAPPORT DES AUDITEURS INDÉPENDANTS

Aux membres de

L’Association canadienne des médecins vétérinaires:


Responsabilité de la direction pour les états financiers

La direction est responsable de la préparation et de la présentation fidèle de ces états financiers conformément aux normes comptables canadiennes pour les organismes sans but lucratif, ainsi que du contrôle interne qu’elle considère comme nécessaire pour permettre la préparation d’états financiers exempts d’anomalies significatives, que celles-ci résultent de fraudes ou d’erreurs.

Responsabilité de l’auditeur

Notre responsabilité consiste à exprimer une opinion sur les états financiers. Nous avons effectué notre audit selon les normes sur la base de notre audit. Nous avons effectué notre audit selon les normes de déontologie et que nous plaçons et réalisons l’audit de façon à obtenir une assurance raisonnable que les états financiers ne comportent pas d’anomalies significatives.


Nous estimons que les éléments probants que nous avons obtenus sont suffisants et appropriés pour fonder notre opinion d’audit.

Opinion

À notre avis, les états financiers donnent, dans tous leurs aspects significatifs, une image fidèle de la situation financière de L’Association canadienne des médecins vétérinaires au 31 décembre 2017, ainsi que de sa performance financière et de ses flux de trésorerie pour l’exercice terminé à cette date, conformément aux normes comptables canadiennes pour les organismes sans but lucratif.

OUSELEY HANVEY CLIPSHAM DEEP LLP
Comptables public enregistrés
### Statement of Financial Position

**As at December 31, 2017**

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<tr>
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<th>2017</th>
<th>2016</th>
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<td><strong>Total Assets</strong></td>
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<th>2017</th>
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**Approved on behalf of the Board**

President

**President**

L’ASSOCIATION CANADIENNE DES MÉDECINS VÉTÉRINAIRES

ÉTAT DE LA SITUATION FINANCIÈRE

AU 31 DÉCEMBRE 2017

A NOM DU CONSEIL D’ADMINISTRATION

Présidente
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**L'ASSOCIATION CANADIENNE DES MÉDECINS VÉTÉRINAIRES**

**ÉTAT DES RÉSULTATS POUR L'EXERCICE TERMINÉ LE 31 DÉCEMBRE 2017**
Special Report Rapport spécial

Building the antimicrobial stewardship leadership plan for animal health in Canada (workshop, Ottawa, October 3–4, 2017)


Antimicrobial stewardship

Antimicrobial resistance (AMR) threatens to push society over a precipice and into the post-antibiotic era (1,2). Animal health and welfare require access to antimicrobials as one tool to manage bacterial infections that threaten animals; however, antimicrobial use (AMU) and misuse in human and animal settings have driven the selection of resistant pathogens that negatively impact the health and well-being of both humans and animals (3). The spring 2015 report from the Office of the Auditor General of Canada highlighted Canada’s activities and deficiencies in its actions to address AMR (4). Included in this was the need to develop a pan-Canadian AMR strategy that includes components that support antimicrobial stewardship (AMS) in human and animal health.

Antimicrobial stewardship is defined as “the multifaceted approaches required to sustain the efficacy of antimicrobials and minimize the emergence of AMR” (5). In this context, the term stewardship refers to society’s higher order management of a situation, in this case AMU and AMR, by taking personal responsibility for the management of antimicrobials as precious resources that benefit society as a whole (5). For animal health, the concept of AMS in Canada is not new and stems in part from 2 conferences to discuss agriculture’s role in managing AMR through prudent AMU in 1999 and 2005 (6,7). In 2011, the Ad Hoc Committee on Antimicrobial Stewardship in Canadian Agriculture and Veterinary Medicine was formed as the outcome of the “AMS in Canadian Agriculture and Veterinary Medicine” conference held in 2011 (8). This meeting brought the concept of stewardship of antimicrobials as a societal responsibility to the forefront in Canada. The many activities to address AMR in Canada have included AMS as a core cross-cutting component that spans human and animal health in a “One Health” context.

In September 2017, the Government of Canada publicly released “Tackling Antimicrobial Resistance and Antimicrobial Use: A Pan-Canadian Framework for Action” (the Framework) (9) outlining Canada’s strategic priorities to combat AMR with the intent that this document would go forward to the United Nations World Health Assembly as Canada’s commitment under the World Health Organization Global Action Plan on AMR (10). One of the 4 pillars of focus in the Framework is AMS, which highlights the need for programs and policies to preserve the effectiveness of antimicrobials by reducing AMU through decreasing the inappropriate and unnecessary prescription and dispensing of antimicrobials in humans and animals. One of the key recommendations for AMS is to “support the development of a pan-Canadian AMS network to provide ongoing leadership and coordinated action across human and animal health sectors, while respecting the roles and responsibilities of each level of government.” As a result, and being aware of an increasing number of apparently uncoordinated and even conflicting initiatives addressing animal AMR across Canada, the Ad Hoc Committee decided to host a workshop, in collaboration with the Public Health Agency of Canada (PHAC), to discuss leadership in animal AMS. This meeting was held in Ottawa on October 3–4, 2017.

Workshop objectives and structure

The purpose of this workshop was to bring together a small group of key partners from the animal health sector in Canada to discuss leadership in AMS. The proposed objectives for the workshop were to:

1. Use existing knowledge of current AMS initiatives for AMU/AMR in animal health in Canada to identify gaps and map out a plan to identify and address future stewardship initiatives.
2. Identify a plan for immediate stewardship activities and communication in response to short-term regulatory and policy changes for animal antimicrobials and long-term activities to address AMR.

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Funding was provided by the Ad Hoc Committee on Antimicrobial Stewardship in Canadian Agriculture and Veterinary Medicine, Public Health Agency of Canada.

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3. Formalize a leadership group to integrate government, industry, and animal health stakeholders to develop a high-level road map of future activities to ensure on-going collaboration amongst the many key players.

Twenty-one representatives, shown in Table 1, participated in the workshop, including the planning committee (John Prescott, Jean Szotnicki, Lindsay Noad, Colleen McElwain, and Lee Gomes) and the facilitator (Simon Otto). They represented groups spanning academia, veterinary medicine, the agriculture industry, and provincial and federal governments. Dr. Siddika Mithani, President of PHAC, welcomed participants on the opening day. Ms. Carolina Giliberti, Executive Vice President of the Canadian Food Inspection Agency, provided opening remarks on the second day. Both emphasized their support and the need for collaboration to build leadership and strong communication for AMS in animal health.

The planning committee structured the workshop to focus primarily on creating dialogue amongst the participants with the ultimate goal of striking a formal leadership group to consolidate and carry forward with AMS activities in animal health in Canada. The committee recognized that, to help maintain focus, not all stakeholders could be included in the workshop but also that the group could not develop and endorse formal plans to move forward without broader input. As a result, the intended results would be taken forward to a broader group for contribution and approval.

The workshop was divided into facilitated sessions that relied on the extensive, collective knowledge of the participants to identify:
1. Current animal health AMS initiatives and gaps in Canada.
2. Short-term/immediate animal health AMS opportunities.
3. A possible structure of an animal leadership group for AMS.
4. Immediate activities to prepare for the pending regulatory and policy changes for veterinary antimicrobials in Canada.
5. Longer-term animal health AMS opportunities.
6. A plan to formalize a leadership group that will address the immediate and longer-term stewardship needs in animal health in Canada.

Workshop results
Participants attended the workshop with open minds and engaged in meaningful discussion. By consensus, the participants agreed that there is a strong need for leadership in the animal health AMS space in Canada. To do this, they considered options for a “home” for this leadership group that is capable of incorporating all parties with a vested interest in animal AMS. This includes industry (e.g., veterinary, food animal, animal health, pharmaceutical), government (federal-provincial-territorial), academia, human and public health. After thorough discussion, the participants agreed to create a proposal to form “Animal AMS Canada,” with the aid of in-kind support from the Animal Nutrition Association of Canada, the Canadian Veterinary Medical Association and the Canadian Animal Health Institute. It was suggested that it should be a self-directed body under the auspices of the National Farmed Animal Health and Welfare Council (NFAWHC). The participants recognized that a similar group, “AMS Canada,” exists in the human-public health sector (Lindsay Noad, personal communication). Animal AMS Canada would communicate with AMS Canada to avoid any duplication and ensure that there is a One Health approach to AMS in Canada that spans the human and animal health sectors.

Participants proposed 4 strategic outcomes for Animal AMS Canada (Table 2). These were grouped around the short- and long-term animal health AMS gaps and opportunities recognized in the earlier working sessions. The immediate, critical outcome was the development of the Animal AMS leadership group (Animal AMS Canada) to coordinate, communicate, and manage AMS in the animal health sector. The rest of the outcomes stem from this. To achieve the first goal, the participants

<table>
<thead>
<tr>
<th>Participant</th>
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<tbody>
<tr>
<td>Dr. Jay Trenton McClure</td>
<td>Atlantic Veterinary College, University of Prince Edward Island</td>
</tr>
<tr>
<td>Donald Boucher</td>
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<td>François Bédard</td>
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<tr>
<td>Dr. Cheryl Waldner</td>
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<td>Dr. Maureen Anderson</td>
<td>Ontario Ministry of Agriculture, Food and Rural Affairs</td>
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<td>My-Lien Bosch</td>
<td>Animal Nutrition Association of Canada</td>
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<tr>
<td>Dr. Darrell Dalton</td>
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<td>Dr. Keith Lehman</td>
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<td>Dr. Hélène Trépanier</td>
<td>Canadian Council of Chief Veterinary Officers, Ministère de l’Agriculture, des Pêcheries et de l’Alimentation</td>
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<td>Rob MacNabb</td>
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<td>Dr. Manisha Mehrotra</td>
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<td>Dr. Rebecca Irwin</td>
<td>Canadian Integrated Program for Antimicrobial Resistance Surveillance, Public Health Agency of Canada</td>
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<tr>
<td>Dr. John Prescott* (workshop co-chair)</td>
<td>Ad Hoc Antimicrobial Stewardship Committee, Ontario Veterinary College, University of Guelph</td>
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<td>Jean Szotnicki* (workshop co-chair)</td>
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<td>Dr. Simon Otto* (workshop facilitator)</td>
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<td>Colleen McElwain*</td>
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<td>Lee Gomes*</td>
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<td>Iyla So (rapporteur)</td>
<td>School of Public Health, University of Alberta</td>
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* Members of the workshop planning committee.
endorsed a small sub-group to develop a proposal to go forward to the NFAHWC meeting at the end of November 2017. Participants proposed initial ideas for governance, resourcing and short-, medium-, and long-term activities for Animal AMS Canada as a platform to develop the proposal. This sub-group was tasked with identifying 2 interim co-chairs to lead the proposal and work. John Prescott agreed to present the draft proposal at the NFAHWC meeting, for which there was initial general broad support. John worked closely with Scott Weese, acting as one of the interim co-chairs for Animal AMS Canada, Simon Otto and Jean Szkotnicki to develop the written proposal for the NFAHWC.

Animal antimicrobial stewardship (AMS) Canada proposal for the National Animal Health and Welfare Council (NFAHWC)

Development of the NFAHWC proposal for Animal AMS Canada is underway. The proposed Mission for Animal AMS Canada is: “Animal AMS Canada strives to provide leadership to optimize the use of antimicrobials in animals to maximize the beneficial impacts on animal health and welfare and minimize the risk of antimicrobial resistance in humans, animals and the environment.” Animal AMS Canada will, we hope, be established formally under the NFAHWC, but will operate at arm’s length with autonomy to set its agenda. It will be coordinated by 2 co-chairs guided by an Expert Advisory Committee (EAC) formed from the membership of a broader Stakeholder Advisory Group (SAG). The SAG will be comprised of representatives from the broad list of stakeholders identified in the Workshop Results. The scope of the work will be determined by the EAC with input from the SAG and will align and collaborate with other organizations (e.g., the Canadian Veterinary Medical Association, CANResist). Funding, including both cash and in-kind contributions, will be sought from various sources.

Next steps

The NFAHWC is considering the formal proposal for Animal AMS Canada. Assuming approval is granted, the co-chair will bring together initial members (still being determined) of the EAC through a conference call or webinar. If possible, funding will be sought to have an in-person meeting of the EAC early in the spring to formalize Animal AMS Canada and begin its work to finalize short-, medium-, and long-term activities.

Acknowledgments

The authors acknowledge the long-standing commitment from the members of the Ad Hoc Committee on Antimicrobial Stewardship in Canadian Agriculture and Veterinary Medicine, not the least of which was to provide funding for this meeting. We also acknowledge Lindsay Noad, Lee Gomes, and their team at the Public Health Agency of Canada for supporting, helping with planning and providing the venue for the workshop.

References

Compassion does not fatigue!

Trisha Dowling

In the health care professions, the words compassion and empathy are frequently used interchangeably, and the term compassion fatigue is often used to describe a type of post-traumatic stress disorder. According to Dr. Charles Figley (1) of Tulane University, “Compassion fatigue is a state experienced by those helping people or animals in distress; it is an extreme state of tension and preoccupation with the suffering of those being helped to the degree that it can create a secondary traumatic stress for the helper.” But emerging research from the social neuroscience laboratory of Dr. Tania Singer of the Max Planck Institute for Human Cognitive and Brain Sciences in Germany shows that compassion fatigue is a misnomer and that it is empathy that fatigues in care givers, not compassion! (2).

Understanding the neurophysiological differences between empathy and compassion is critical to alleviating the emotional distress frequently experienced by veterinarians and veterinary technologists. To explain the differences, Singer developed a hierarchy model of empathy and compassion (Figure 1).

Empathy

Empathy is a mental construct that allows us to resonate with others’ positive and negative feelings. We can feel happy at the joy of others and we can feel distress when we observe someone in physical or mental pain. While sharing positive emotions with others is certainly pleasant, the sharing of negative emotions can be difficult.

The development of functional magnetic resonance imaging (fMRI) opened the way for neuroscientists to explore the brain circuitry involved when people experience pain in themselves as well as when they observe someone else feeling pain. To investigate pain-related empathy, Dr. Singer studied married couples, with the assumption that couples are likely to feel empathy for each other. Using fMRI scanners, she investigated the brain networks that were activated when a painful stimulus was applied to the hand of one partner and the other partner could see and hear their reaction. Areas of the anterior insula and the anterior middle cingulate cortex were activated when subjects received pain but also when they observed that their partner experienced pain. Other parts of the pain network were activated only in the partner actually receiving the painful stimulus. Singer concluded that the part of the pain network associated with its emotional qualities, but not its sensory qualities, mediates empathy for suffering (3). Thus, both the firsthand experience of pain and the knowledge that a beloved partner is experiencing pain activate the same emotional brain circuits.

In human interactions, feeling empathy is the first step in building social connection. But it is very important that in empathy you feel with the other person, but you don’t confuse yourself with the other; you still know that the emotion you resonate with is the emotion of the other person (4). A good example of appropriate empathy is helping a client through the euthanasia experience. As I have euthanized many of my own animals during my 30-year veterinary career, I can express to the client “I know how you feel” and I feel my own sadness during the euthanasia process. But I can tell that I’m feeling and honoring their grief and not making the grief my own.

After empathy establishes the connection between us, the second step of the hierarchy can diverge into the processes of empathetic distress or compassion and empathetic concern. Whether observation of distress in others leads to empathic concern and altruistic motivation or to personal distress and self-centered emotions depends upon our capacity for “self-other” differentiation (5).

When the “self-other” distinction becomes blurred and we take on the emotional pain of the other person as our own pain, empathetic distress results. In my euthanasia example, if I’m not able to distinguish my client’s grief from my grief over the loss of my own animals, then I move into empathic distress. Empathic distress is the strong aversive and self-oriented response to the suffering of others, accompanied by the desire to withdraw from a situation in order to protect one’s self from excessive negative feelings. As I become overwhelmed by my own euthanasia-associated grief, I may try to avoid the aversive situation by rushing the client through the euthanasia process and withdraw from further interactions with my client as a mechanism to protect myself. The fMRI data show that adopting the self-perspective leads to increased activation in brain areas involved...
in the processing of threat or pain, such as the amygdala (5). Chronic pain, whether mental or physical, depletes dopamine levels within brain circuits mediating reward and motivation (6). When locked into empathic distress, we have a blunted capacity to experience pleasure along with decreased motivation for natural rewards. Chronic depletion of dopamine from repeated episodes of empathic distress is what leads to *burnout*, characterized in health care professionals as emotional exhaustion, withdrawal, depersonalization, and a decreased sense of personal accomplishment due to work-related stress (7).

**Compassion**

In contrast to empathy, compassion is characterized by feelings of warmth, concern, and care for the other, as well as a strong motivation to improve the other’s wellbeing. Compassion goes beyond feeling *with* the other to feeling *for* the other. Unlike empathy, compassion increases activity in the areas of the brain involved in dopaminergic reward and oxytocin-related affiliative processes, and enhances positive emotions in response to adverse situations (8). While empathizing with my client making a euthanasia decision invokes my own feelings of sadness, moving to compassion for my client’s situation results in sympathizing, empathic concern, and positive emotional feelings that counterbalance my sadness and cause me to take action to help my client. Instead of withdrawing and rushing through the procedure in self-defence, compassion enables me to slow down and be present with my client without experiencing distress.

This is the critical property of compassion that differentiates it from empathy. Because compassion generates positive emotions, it counteracts negative effects of empathy elicited by experiencing others’ suffering. Unlike the dopamine depletion that occurs from activation of the pain networks, the neural networks activated when people feel compassion towards others activate brain areas linked to reward processing that are full of receptors for oxytocin and vasopressin, the neuropeptides that are crucial in attachment and bonding (2). Compassion does not fatigue — it is neurologically rejuvenating!

**Cultivating compassion**

Interventions to deal with burnout in health care professionals typically focus on stress management and other self-care strategies, but have little evidence of efficacy (7). While self-care is always a good thing, Singer and other neuroscientists have proven that compassion is a skill that can be cultivated, and that empathic distress can be reversed, by learning how to turn empathy into compassion.

The most well-studied techniques for compassion skills are found in mindfulness meditation programs. Even with short periods of compassion training, participants continue to feel empathy for the suffering of others, but gain the capacity to feel positive emotions without feeling distress (8).

With the understanding that empathic distress is self-centered while compassion is other-centered, it should come as no surprise that wellness is a social phenomenon and the techniques for cultivating compassion are taught in groups with interactive exercises. In fact, many studies now demonstrate that compassion training leads to long-lasting changes in attitudes and behaviors toward other people that transcend the specific situation in which compassionate feelings were evoked, and moreover that these prosocial behaviors transfer to a broad range of people and situations (9,10).

**References**

Case Report  Rapport de cas

Long-term clinical control of feline pancreatic carcinoma with toceranib phosphate

Andrea M. Dedeaux, Ingeborg M. Langohr, Bonnie B. Boudreaux

Abstract — An 11-year-old, spayed female, domestic shorthair cat was presented with a non-resectable abdominal mass diagnosed as carcinomatosis of pancreatic origin. Treatment with toceranib phosphate was started. Abdominal ultrasound approximately 1 year after diagnosis revealed progressive disease. The cat was humanely euthanized approximately 792 days after initial presentation due to progressive clinical signs.

Résumé — Contrôle clinique à long terme du carcinome pancréatique félin avec le tocéranib phosphate. Un chatte commune domestique stérilisée âgée de 11 ans a été présentée avec une masse abdominale non résécable diagnostiquée comme une carcinomatose d’origine pancréatique. Le tocéranib phosphate a été administré. L’échographie abdominale environ 1 an après le diagnostic a révélé une maladie progressive. La chatte a été euthanasiée sans cruauté environ 792 jours après la présentation initiale en raison de signes cliniques progressifs.

Can Vet J 2018;59:751–754

Case description

An 11-year-old, spayed female, domestic shorthair cat was presented to her primary veterinarian because of a 3-day history of anorexia and lethargy. Abdominal radiographs revealed a space-occupying mass within the abdomen. Gross findings by the primary veterinarian on laparotomy included a cystic mass extending from the pancreas to the omentum surrounding the jejunum. Due to advanced stage of disease, surgical biopsies of the abnormal omentum were collected for diagnosis without further debulking of the tumor. Histopathology was consistent with carcinoma with spread throughout the omentum. The mitotic index of the mass was 3/10 high power field (hpf). The cat recovered well after surgery, but still had a decreased appetite. She was then referred to the Oncology Service at the Louisiana State University (LSU) Veterinary Teaching Hospital.

The cat was presented to LSU 10 d after exploratory laparotomy. Upon presentation, the cat was noted to be obese (body condition score 8/9). A mass was palpated in the mid-abdomen on physical examination. Recent skin wounds were noted on the right flank. Complete blood (cell) count (CBC) revealed a mild leukocytosis [white blood cells 13.2 × 10⁹/L, reference range (RR): 6.0 to 10.0 × 10⁹ cells/L]. Serum chemistry revealed hyperglycemia (10.2 mmol/L, RR: 4.7 to 6.3 mmol/L), likely due to stress, and a mild hypercholesterolemia (5.4 mmol/L, RR: 2.5 to 4.6 mmol/L). Urinalysis was unremarkable. Three-view thoracic radiographs did not reveal any evidence of pulmonary metastasis. Abdominal ultrasound revealed a 5.5 cm, complex, cystic mass arising from the right limb of the pancreas with extension into the omentum.

Serial sections from the original biopsy performed by the primary veterinarian were available for second-opinion histologic evaluation. One section consisted entirely of fibrinosuppurative exudate. The other 2 sections showed a band of connective and adipose tissue, interpreted as omentum, thickened up to 2 mm by granulation tissue, acute hemorrhage, and superficial fibrinosuppurative exudate. Cuboidal to columnar epithelial cells proliferated multifocally along the surface and formed occasional deeply located glandular-like structures. The cells had moderate to abundant eosinophilic cytoplasm and basally oriented, crowded, round, vesicular nuclei with prominent single nucleoli (Figure 1). Cell atypia was mild; mitoses were rare, (< 1/10 hpf). Multiple cells had strong cytoplasmic immunoreactivity to cytokeratin 7 and cytokeratin 20 (Figure 2).

The biopsy specimens in this case were sampled from the omentum. Histologic findings were therefore interpreted as omental carcinomatosis. While a pancreatic mass was identified via both abdominal exploratory surgery and follow-up abdominal imaging, routine histopathology alone could not completely rule out intestinal origin of the tumor. Nonetheless,
the dual cytokeratin 7 and 20 positive immunophenotype further supported the diagnosis of exocrine pancreatic carcinoma, particularly in light of the repeated clinical diagnostic imaging findings (1).

Cefovecin (Convenia; Zoetis, Parsippany, New Jersey, USA), 8 mg/kg body weight (BW), SC, once, and buprenorphine (Par Pharma; Chestnut Ridge, New Jersey, USA), 0.01 mg/kg BW, PO, q8h, were prescribed for the skin wounds and tender abdomen, respectively, due to the cat’s fractious nature while in the veterinary hospital. A recheck was conducted 2 wk later. Reported anorexia had resolved so toceranib phosphate (Palladia; Zoetis), 15 mg [2.5 mg/kg body weight (BW), PO, Monday, Wednesday, Friday] was prescribed.

The pancreatic mass was noted to be stable in size via ultrasound examination 6 wk after commencement of drug therapy. Repeat staging was delayed for several months due to the cat’s temperament and lack of clinical signs.

Throughout treatment with toceranib, CBC, blood chemistry, and urinalysis were determined approximately every 4 to 6 wk. An intermittent Veterinary Cooperative Oncology Group (VCOG) grade I (2) thrombocytopenia of 113 to 188 × 10^9/L (RR: 190 to 368 × 10^9/L) was observed on several occasions. Platelet clumping was noted on blood smear at some, but not all time points. No other clinicopathologic abnormalities were documented.

Repeat staging was done ~11 mo after initial presentation to LSU. No evidence of pulmonary metastasis was noted on 3-view thoracic radiography. Abdominal ultrasound revealed a progressive, complex, cystic pancreatic mass, along with colic lymphadenopathy and regional peritonitis consistent with the previous diagnosis of pancreatic carcinoma. Chemotherapy with toceranib was continued despite progressive disease as the patient no longer had the initial presenting clinical signs of anorexia and lethargy. Her weight remained stable throughout the treatment period. She developed diabetes mellitus 18 mo post-diagnosis but was well-regulated with insulin glargine (Lantus; Sanofi, Laval, Quebec) in addition to a high protein, low carbohydrate canned diet (Purina Pro Plan Veterinary Diets DM, Dietetic Management Feline Formula; Nestle Purina, St. Louis, Missouri, USA). The cat was presented 792 d after initial presentation for progressive clinical signs (e.g., anorexia); she was humanely euthanized at that time. A postmortem examination was declined by the owner.

To our knowledge, this is the first report of long-term control of clinical signs such as anorexia and lethargy, in addition to prolonged survival for a cat with pancreatic carcinoma treated with toceranib phosphate.

**Discussion**

Exocrine pancreatic carcinoma is a rare tumor of pancreatic acinar or ductular epithelial cells in the cat (3,4). The exact cell of origin of this neoplasm remains controversial. The biologic behavior can best be described as locally aggressive and highly metastatic. Sites of spread include regional lymph nodes, liver, spleen, peritoneal lining, gastrointestinal tract, kidney, mesentery, diaphragm, pleura, lung, and heart (5–8). Most affected cats are older at the time of diagnosis, with a mean age of 11.0 to 11.6 y (7,8). No sex or breed predispositions have been noted. Clinical signs are non-specific, overlapping with other gastrointestinal diseases, and most commonly include anorexia, weight loss, vomiting, and diarrhea. An increased prevalence of exocrine pancreatic carcinoma has been noted in diabetic cats (7–9). A palpable abdominal mass is a common physical examination finding (7,8).

The prognosis for cats with pancreatic carcinomas is grave due to the high degree of local invasion and early metastasis, with reported survival times of only days to weeks (7,8). The presence of abdominal effusion at presentation is a negative prognostic indicator for survival. Surgery and chemotherapy have been shown to prolong survival. Even with these treatments, however, less than 10% of affected cats live longer than 1 y. These long-term responders (n = 3)
received either traditional maximum tolerated dose (MTD) chemotherapy alone \((n = 1)\) or in combination with surgery \((n = 2)\) \((8)\).

No specific chemotherapy protocols have been established for pancreatic carcinomas due to the rarity and generally poor prognosis of this tumor. The use of a combination of gemcitabine and carboplatin resulted in prolonged survival in 1 of 3 cats with pancreatic carcinoma \((10)\). The other 2 cats experienced progressive disease on this chemotherapy regimen. Unfortunately, 14.3% of cats experienced grade 3 or 4 neutropenia and 50% of cats experienced gastrointestinal toxicity. This led to 42.8% of the study population experiencing treatment delays. The side effect profile of this protocol has limited its use.

Molecular therapies targeting tumor angiogenesis have been intensely studied in human pancreatic cancer. Although the influence of pro-angiogenic factors remains in question, evidence suggests that blockade of vascular endothelial growth factor receptors \((\text{VEGFR})\) with drugs such as the tyrosine kinase inhibitor sunitinib may be beneficial. Sunitinib has a similar profile to toceranib phosphate and has shown success in prolonging survival in human patients with pancreatic adenocarcinoma when used as a maintenance therapy \((11)\).

Toceranib phosphate is a tyrosine kinase inhibitor with known activity against KIT, platelet-derived growth factor \(\alpha\) and \(\beta\), VEGFR 1 and 2, Fms-like tyrosine kinase 3 \((\text{FLT} 3)\), and colony-stimulating factor 1 receptor \((\text{CSR}1R)\) \((12)\). It is approved for use in dogs with Patnaik grades II and III, recurrent, cutaneous mast cell tumors with or without regional lymph node involvement. Toceranib has been reported to provide clinical benefit to dogs with various neoplasms, including multiple types of carcinomas \((13)\). Although there has not been any research regarding the efficacy of tyrosine kinase inhibitors in treatment of feline exocrine pancreatic carcinomas, in a retrospective study of cats with this type of tumor, 3 were placed on different tyrosine kinase inhibitors \((\text{imatinib, masitinib, toceranib})\). Only the one which received toceranib had stable disease for at least 3 mo. This cat was then unfortunately lost to follow-up \((8)\). The median survival time of cats not receiving surgery or chemotherapy was only 6 d \((7)\).

With the advent of new targeted cancer therapies have come new challenges in determining response to treatment. For many traditional cytotoxic chemotherapy agents, response to treatment is defined as an objective decrease in size \([\text{i.e., Response Evaluation Criteria In Solid Tumors (RECIST)}]\). However, a therapy such as toceranib likely exhibits its effects in some cancers by inhibiting angiogenesis \((14–16)\). Drugs that work by targeting tumor blood vessel formation help stabilize or slow disease progression. Thus, while not valued under the traditional tumor response paradigm, patients still receive clinical benefit from either stable disease or slowing of the disease progression, which can be difficult to quantitate.

Although not approved for use in cats, toceranib and other tyrosine kinase inhibitors have been used off-label in this species and appear to be well-tolerated \((17–23)\). The main side effects reported in cats include myelosuppression, azotemia, increased alanine aminotransferase activity, and gastrointestinal signs \((19–23)\). The mild thrombocytopenia that occurred in our cat was most likely due to an artificial decrease in platelet number as platelet clumping was noted on most complete blood cell counts. Alternatively, drug-induced myelosuppression cannot be ruled out. Regardless of the cause, the cat did not experience any clinical signs as a result of this abnormality.

Toceranib phosphate appeared to provide clinical benefit to this cat. Clinically significant side effects were not encountered during the approximately 25-month course of treatment. Use of tyrosine kinase inhibitors, specifically toceranib phosphate, may lead to improved outcomes in exocrine pancreatic carcinoma. The oral administration of this medication allows for less frequent veterinary visits that can help maintain the quality of life of the affected cat. Further study of this medication and its role in treatment of exocrine pancreatic carcinoma in cats is needed.

The histopathologic specimen obtained for diagnosis in this cat was a metastatic lesion from the omentum, making determination of organ of origin difficult. Feline ductal adenocarcinoma has been shown to have dual expression of cytokeratin 7 and 20 such as found in our samples whereas feline intestinal adenocarcinoma is generally only cytokeratin 20 positive \((1)\). Immunohistochemistry findings, combined with surgical visualization by the primary veterinarian and findings at multiple ultrasound examinations of a cystic pancreatic mass, make intestinal adenocarcinoma unlikely.

In conclusion, while exocrine pancreatic carcinoma typically carries a poor long-term prognosis, with the use of toceranib the cat in this report experienced long-term survival of 792 d after initial presentation. Previous literature suggests that less than 10% of affected cats treated with both complete surgical removal of the pancreatic mass and chemotherapy or chemotherapy alone will survive longer than 1 y \((8)\). Median survival time reported for cats with exocrine pancreatic carcinoma without treatment is 6 d \((8)\). The longest reported survival of a cat with exocrine pancreatic carcinoma noted in the literature was 532 d \((10)\). The cat in that study was treated with MTD chemotherapy only. The cat described in this case report had macroscopic pancreatic disease that was treated only with toceranib. While she was euthanized 792 d after initial presentation due to clinical signs consistent with disease progression, significant side effects from chemotherapy were not encountered. Based upon historical data documenting the typical biologic behavior of this tumor, toceranib phosphate appears to have provided significant clinical benefit, although the presence of a more indolent form of disease cannot be excluded.

### Acknowledgments

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### References


2. Veterinary cooperative oncology group — Common terminology criteria for adverse events \((\text{VCOG-CTCAE})\) following chemotherapy or biological antineoplastic therapy in dogs and cats v1.1. Vet Comp Oncol 2011;14:417–446.

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Case Report Rapport de cas

Acute cerebrovascular event in a dog with polycythemia vera

William Kay, Jr., Jennifer M. Gambino, Kari V. Lunsford, Andrew Mackin, Andy Shores, Jim Cooley, Michaela J. Beasley

Abstract — A 1-year-old neutered male Labrador retriever mixed breed dog was referred for peracute onset of ataxia and seizures. Hematocrit at presentation was 84%. Magnetic resonance imaging of the brain revealed a lesion in the right caudate nucleus consistent with infarction. Postmortem findings were consistent with polycythemia vera and presumed secondary cerebral infarction.

Résumé — Événement cérébrovasculaire aigu chez un chien atteint de polycythémie vraie. Un Labrador retriever mâle âgé de 1 an a été référé pour l’apparition suraiguë d’ataxie et de crises d’épilepsie. L’hématocrite était de 84 % à la présentation. L’imagerie par résonance magnétique du cerveau a révélé une lésion dans le noyau caudé droit compatible avec un infarctus. Les résultats post mortem étaient conformes à une polycythémie vraie et à un infarctus cérébral secondaire présumé.

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Polycythemia vera is a primary myeloproliferative disorder characterized by overproduction of erythroid cells at the level of the bone marrow, independent of the influence of erythropoietin (EPO) (1). Clinical features associated with canine polycythemia vera include polyuria, polydipsia, lethargy, exercise intolerance, behavioral changes, and neurological disorders attributable to hyperviscosity syndrome (2,3). Diagnosis relies on documentation of a markedly elevated hematocrit (HCT) with concurrent decreased serum EPO levels, and absence of causes of secondary erythrocytosis (4). This case report describes a young dog with cerebral infarction and peracute seizures secondary to polycythemia vera.

Case description

A 1-year-old, 16-kg neutered male Labrador retriever mixed breed dog was presented as an emergency referral for peracute onset of ataxia, intermittent falling, and inability to climb stairs that began the morning of presentation. Evaluation before referral revealed erythrocytosis [HCT 63%, reference interval (RI): 34% to 60%]. Immediately prior to admission, the dog had a generalized tonic-clonic seizure with loss of consciousness and urinary incontinence for approximately 1 minute duration. Upon arrival, the dog was administered midazolam (Hospira, Lake Forest, Illinois, USA), 0.5 mg/kg body weight (BW), IV, levetiracetam (Hospira), 30 mg/kg BW, IV, and 3% hypertonic saline (Baxter Healthcare, Deerfield, Illinois, USA), 4 mL/kg BW, IV for stabilization. Pertinent history included chronic polydipsia and polyuria recently treated with water deprivation, and an acute onset of ataxia at home beginning at 5 am the day of presentation. Vaccinations were current and there was no known exposure to toxins.

Neurologic examination following therapeutic intervention revealed lateral recumbence, intermittent opisthotonus to rightsided pleurothotonos, absent menace and visual tracking, and intact pupillary light responses, bilaterally. Spinal reflexes were normal, with a generalized increase in limb tonicity. Mental status and postural reactions could not be reliably assessed due to the post-ictal status of the patient and previously administered midazolam. Physical examination revealed mild hyperthermia (39.6°C), tachycardia (168 beats/min), hyperemic mucous membranes, and an estimated 5% dehydration. A complete blood (cell) count (CBC) revealed marked erythrocytosis [hematocrit (HCT) 84.6%, RI: 34% to 60%], microcytosis [mean corpuscular volume (MCV) 49.4 fl, RI: 63 to 77 fl] and hypochromasia [mean corpuscular hemoglobin concentration (MCHC) 279 g/L, RI: 320 to 370 g/L]. Blood pressure, blood glucose, sodium, and clotting profile were normal. Urine specific gravity was 1.018. An intravenous bolus of an isotonic crystalloid was
administered. Given the neurophysical findings, neurolocalization suggested a lesion in the right prosencephalon due to the combination of generalized seizure activity and intermittent right-sided pleurothotonus.

Imaging was performed within 3 h of the first seizure, with a 3 Tesla magnet (3T GE Signa; GE Healthcare, Milwaukee, Wisconsin, USA) and a standard minimum protocol comprised of T1-weighted (W), T2-W, T2-W fluid attenuated inversion recovery (FLAIR), T2-W Gradient echo (GRE) and fast spoiled gradient echo (FSPGR), before and after the administration of gadodiamide (Omniscan; GE Healthcare, Princeton, New Jersey, USA), 0.01 mmol/kg BW, IV. Diffusion weighted imaging (DWI) was also performed. Findings included a non-enhancing, ill-defined region of T2-W and T2-W FLAIR hyperintensity of the right caudate nucleus, corresponding to T1-W FLAIR and T2-W GRE isointensity. Mild hyperintensity was seen on the DWI sequence, which corresponded to decreased signal intensity on the apparent diffusion coefficient (ADC) map image (E). Combined findings are consistent with cytotoxic edema and restriction of diffusion due to non-hemorrhagic territorial infarction of the right caudate nucleus. (GE Signa Excite HDx 3.0T; General Electric).

Post-imaging therapy included intravenous crystalloid fluids, titrated to match urine production monitored via an indwelling urinary catheter over 3 d of hospitalization. Multiple phlebotomies were performed in conjunction with fluid administration. The lowest recorded packed cell volume was 72% (range: 72% to 79%). Serial blood glucose values were low (0.48 to 0.55 g/L) and were treated with intravenous 50% dextrose boluses. Abdominal ultrasound and echocardiogram were unremarkable. Exclusion of common causes of secondary erythrocytosis led to a presumptive diagnosis of polycythemia vera (PV).

The patient experienced no additional seizures while hospitalized. Financial limitations precluded additional diagnostics such as bone marrow analysis and serum EPO levels. Euthanasia was carried out 3 d after admission, given the prognosis and the owner’s financial concerns.

Necropsy confirmed hypercellular bone marrow (90:10 cells to fat), with a predominance of erythroid series (approximately 95%). Erythroid cells consisted of approximately 15% to 20% blasts, intermingled with large numbers of nucleated erythrocytes and smaller numbers of metarubricytes. Maturation of both erythroid and myeloid series was complete (Figure 2).
The right caudate nucleus of the brain had a focus of acute encephalomalacia associated with arterial fibrinoid necrosis (Figure 3). Smaller foci of chronic infarction with fibrinoid necrosis of the arterioles with associated encephalomalacia and early macrophage response were in the adjacent neuropil (Figure 4). Moderate C-cell hyperplasia in the thyroid glands and vacuolar hepatopathy were also noted. The remainder of the organs were grossly and histologically normal. Without findings supportive of secondary erythrocytosis, such as cardiopulmonary disease, renal disorders, or paraneoplastic syndromes (1), the final diagnosis was PV with associated acute ischemic infarction of the right caudate nucleus.

Discussion
Cases of PV are sporadically reported in the veterinary literature (2–4). Polycythemia vera is a chronic myeloproliferative disorder, most commonly affecting middle-aged female dogs (1). Clinical signs can include marked hyperemia, neurological disturbances, bleeding diatheses, and polyuria and polydipsia (1). Associated co-morbidities or sequelae in the dog include glomerulonephritis, uveitis, obsessive compulsive disorder, and tetraparesis and seizures previously presumed to be secondary to central nervous system infarction (2,3,6–8). Excessive red blood cell volume results in hyperviscosity syndrome, which, through various mechanisms, can initiate the coagulation cascade. Platelet activation can play a significant role in arterial and venous thrombosis in PV (1,9). In humans with PV, up to 49% present with thrombosis, and have a reported 2.7 times incidence of ischemic stroke, despite receiving an aspirin regimen treatment (10,11). The case presented here is the first case of PV with presumed secondary cerebral infarction (confirmed by MRI and necropsy) in the dog.

The diagnosis of PV is typically predicated on finding a markedly elevated HCT in the absence of identifiable causes of relative or secondary polycythemia. Ancillary testing includes confirmation of low serum EPO levels and bone marrow analysis showing erythroid hyperplasia (2,12). As was the case in this dog, hypoglycemia may be associated with increased glucose utilization by an expanded RBC population (1). Failure to respond to appropriate fluid resuscitation is consistent with absolute polycythemia (an increase in RBC mass) (2,8).

Prior to necropsy, a presumptive diagnosis of PV in this case was based on a clinical history of polydipsia and polyuria, a markedly increased PCV that persisted despite repeated phlebotomy and aggressive fluid therapy, intermittent hypoglycemia, and a thorough exclusion of causes of secondary erythrocytosis. Although EPO levels were not measured, postmortem examination confirmed the definitive diagnosis of PV. Histopathologic findings of a focal area of malacia within...
the caudate nucleus with fibrinoid necrosis of the arterial walls and infiltration of macrophages were consistent with an ischemic event coherent with the time course of this patient’s clinical signs (13). The acute neurologic episode with MRI and histopathology findings consistent with ischemic stroke was a suspected sequela of hyperviscosity syndrome secondary to this patient’s PV.

Imaging in this case supported a diagnosis of ischemic stroke consistent with occlusion of a striate artery (14). In controlled models of ischemic stroke in the dog, DWI is a consistent indicator of cytotoxic edema identified as a hyperintensity on DWI with hypointensity on a reformatted ADC map (5). Acute cerebral infarctions lead to cytotoxic edema, which is identified by DWI as early as 3 h after the event (5,15). T2-W and T2-W FLAIR hyperintensity, as observed in this case, are also seen, although less commonly, as early as 3 h after an ischemic event (5).

This case is not typical of many previously reported canine PV cases. First, this patient was presented with severe acute deterioration at only 12 mo of age. Seizure activity, in which no advanced imaging was pursued, is reported in a single previous case of PV in a young dog (2). Second, CBC findings in dogs with PV typically show a normocytic normochromic erythrocytosis (8,12,16). This case, in contrast, had a microcytic hypochromic erythrocytosis. The mechanisms of the microcytosis and hypochromasia are unknown. Microcytosis and hypochromasia of undetermined origin are reported in some humans with PV (17). One potential explanation for this particular RBC morphology is neoplastic transformation of a fetal, rather than adult, erythrocytoid cell line (18). With chronic treatment via phlebotomy, iron deficiency may also contribute to microcytosis and hypochromasia. Interestingly, in human PV patients, RBC hypochromasia has been associated with an increased risk for thrombus-induced death (19).

Although financial constraints prevented chronic treatment of the patient in this report, prolonged survival with therapy is documented. Treatment for PV in veterinary medicine is centered on reducing blood viscosity. The standard approach to stabilization, manual reduction in RBC mass via phlebotomy, provides only temporary relief, with recurrence of clinical signs in less than 6 mo (20). Treatment with phlebotomy alone is also associated with increased risk of iron deficiency and fluctuating blood viscosity (19,21). The adjunctive use of myelosuppressive agents can improve survival times. Adjunctive hydroxyurea in dogs is associated with survival times of 8 to 33 mo (3,22). Treatment in humans also involves the use of hydroxyurea, sometimes in combination with interferon alpha and antithrombotic agents (23).

In conclusion, this is the first published case report documenting cerebral infarction presumably caused by PV in the dog as demonstrated by both MR imaging and histopathology.

References

Successful management of proteinuria and systemic hypertension in a dog with renal cell carcinoma with surgery, telmisartan, and amlodipine

Yong-Jin Kwon, Guk-Hyun Suh, Seong-Soo Kang, Ha-Jung Kim

Abstract — An 11-year-old neutered male Yorkshire terrier dog was presented with a 3-week history of hematuria and anorexia. A unilateral renal mass was detected and surgically removed. The renal mass was diagnosed on histopathologic examination as a renal carcinoma. Supportive medical therapy was carried out and persistent systemic hypertension was managed using telmisartan.

Résumé — Gestion réussie de la protéinurie et de l’hypertension systémique chez un chien atteint d’un carcinome rénal à l’aide d’une chirurgie, de telmisartan et d’amlodipine. Un chien yorkshire terrier mâle stérilisé âgé de 11 ans a été présenté avec une anamnèse de 3 semaines d’hématurie et d’anorexie. Une masse rénale unilatérale a été détectée et excisée par chirurgie. La masse rénale a été diagnostiquée à l’examen histopathologique comme étant un carcinome rénal. Une thérapie médicale de soutien a été réalisée et l’hypertension systémique persistante a été gérée à l’aide de telmisartan.

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Renal cell carcinoma is an uncommon neoplasia of the kidney in dogs, but it is also the most common type of primary renal tumor in dogs (1). The prevalence of primary renal neoplasia is estimated to be 0.3% to 1.5% of all canine neoplasias (2). German shepherd dogs are known to be predisposed to renal tumors (3). Dogs with renal cell carcinoma frequently present with hematuria, anorexia, and weight loss (4); anemia and fever are also common clinical findings, but are rarely present concurrently (5). A biochemical panel may detect renal azotemia and increased liver enzyme concentrations, but blood test results are often within normal limits, especially if the tumor is unilateral (4,6,7). Urinalysis may be normal, but the patient can present with proteinuria and/or gross or microscopic hematuria (4,5). The size and location of the mass can be identified by abdominal radiography. Thoracic radiographs may help identify any evidence of metastases to thoracic organs, with the lungs most frequently implicated; this finding may influence the treatment protocol (5). Abdominal ultrasonography or intravenous urography helps clinicians recognize the kidney mass more reliably than radiography alone (4). Computed tomography (CT) scanning helps identify evidence of metastasis and adhesion to surrounding structures (caudal vena cava, lumbar musculature, adrenal glands) in more detail (8).

A definitive diagnosis requires post-operative histopathological identification of neoplastic cells in the affected tissue (5). Nephroureterectomy is the mainstay of treatment of renal cell carcinoma in cases with unilateral kidney involvement in which contralateral kidney function is normal and metastases are not evident (5,7). In several studies, chronic renal failure occurred after nephroureterectomy; therefore, regular monitoring to determine whether patients have complications associated with chronic renal insufficiency (CRI) is essential, and appropriate therapy should be administered (9,10). This case describes the diagnostic work-up of a dog with unilateral renal cell carcinoma and successful medical management after nephroureterectomy.

Case description

An 11-year-old, neutered male Yorkshire terrier dog with a 3-week history of intermittent hematuria and sustained anorexia was referred to our facility. On physical examination, the dog was alert and the body temperature, pulse rate, and respiratory rate were normal, but systemic hypertension was identified. Blood pressure was 170 mmHg as measured using an ultrasonic Doppler flow detector. As part of the diagnostic work-up, a complete blood (cell) count (CBC), biochemical panel, electrolytes and gases, coagulation tests, urinalysis, and urine culture were conducted. Thrombocytosis [546 × 10^9/L; reference interval (RI): 148 to 484 × 10^9/L] was detected on CBC and an increased blood urea nitrogen (BUN) concentration (14.6 mmol/L; RI: 2.5 to 9.6 mmol/L) was identified on the biochemical panel, which was likely due to decreased renal function. Prothrombin time (PT) was normal (15 s), activated partial thrombin time (aPTT) was delayed (114 s), and the D-dimer value was normal. Urinalysis revealed relatively good concentration ability (specific gravity 1.032; RI: 1.008 to

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1.012), hematuria, and a high urine protein-creatinine ratio (UPC) (> 12.5). The urine culture was negative.

Thoracic radiographs showed no remarkable findings, and an abdominal radiograph showed a mass that occupied most of the right middle abdomen; its estimated size was 4.5 × 7.5 cm on the ventroabdominal view. On the right lateral view, the mass was suspected to originate from the retroperitoneum. The abdominal ultrasonograph revealed a 5-cm mass in the right kidney (Figure 1A). Most of the mass consisted of multifocal cysts, which had distinct demarcations, and some parts of the mass had hyperechoic parenchyma. The left kidney was normal (Figure 1B,C). A presumptive diagnosis of a mixed echogenic mass originating from the right kidney was made, which included unilateral renal neoplasia, renal abscess, or pyonephrosis.

A CT scan confirmed the mass in the right kidney but did not identify metastases to other organs (Figure 1D). Most of the parenchyma of the mass could not be visualized with the exception of a cranial section of the right kidney, and the mass was full of fluid (16 HU). There was a small possibility that the fluid was a suppurative or bloody effusion. The mass was suspected to be a primary cancer, as both kidneys were asymmetric and there was no mesenteric edema surrounding the mass. Unilateral primary renal neoplasia was tentatively diagnosed.

A nephroureterectomy was performed and a large, heterogeneous mass and other affected tissues, including the caudal vena cava and adrenal gland, were removed from the right kidney. The diameter of the mass was 5.5 × 8 cm (Figure 2A,B) and the mitotic index was < 10.

After surgery, histopathology revealed an invasive renal carcinoma. Within the kidney, the normal architecture was extensively compressed, resulting in bands of connective tissue surrounding atrophic renal tubules or glomerular structures, and neoplastic cell infiltration was observed (Figure 2C). The neoplastic cells were moderately pleomorphic and were characterized by a variable amount of basophilic, occasionally vacuolated cytoplasm, hyperchromatic anisokaryotic round/ovoid nuclei, and often, prominent nucleoli. The renal cell carcinoma had spread into the adjacent perirenal connective tissue, accompanied by secondary inflammation and hemorrhage (Figure 2D).

After surgery, the patient had a urinary catheter and oliguria [< 2 mL/kg body weight (BW) per hour] was detected. The values of BUN and creatinine were 10 mmol/L (RI: 2.5 to 9.6 mmol/L) and 70.7 μmol/L (RI: 44.2 to 159.1 μmol/L), respectively. Because the patient might have been hypovolemic and acute renal failure could occur, aggressive fluid therapy was administered. Hartmann’s Solution (Hartmann’s Sol; CJ Health Care, Eumsung, Chungbuk, Korea) was administered at a rate.

Figure 1. Ultrasonographic images of the abdomen of a dog with renal cell carcinoma. A — The affected right kidney; B, C — The normal left kidney. D — A computed tomography (CT) image of both kidneys. Most of the parenchymal structure of the right kidney has been replaced by hypoechoic fluid (A, D star). The left kidney had a normal structure and blood flow on ultrasonography. Apparent contrast enhancement was identified in the left kidney on CT scanning.
based on 5% dehydration, and furosemide (Lasix; Handok, Seoul, Korea), 1 mg/kg BW per hour, IV, was administered for 6 h. Polyuria (> 5 mg/kg BW per hour) was identified 3 h after the first furosemide administration. Urinalysis was performed and the urine specific gravity was 1.035 and the UPC was 0.5. The patient received intensive care, including monitoring of body temperature, pulse rate, respiratory rate, and blood pressure. To prevent bacterial infection and sepsis, cefotaxime sodium (Wooridul; Hwasung, Gyeong-gi, Korea), 30 mg/kg BW, IV, was administered every 8 h. D-dimer concentration increased (1.5 mg/L, reference range: 0 to 0.3 mg/L), possibly due to blood loss, and dalteparin sodium (Fragmin; Pfizer Belgium, Puurs, Belgium), 150 IU/kg BW, SC, was administered every 8 h for 24 h before d-dimer concentration returned to normal (0.1 mg/L). Nonregenerative anemia [hematocrit (HCT) = 24] was managed by administering recombinant human erythropoietin (Epokine prefilled injection; CJ Health Care, I-cheon, Gyeong-gi, Korea), 100 IU/kg BW, SC, q48h. Anemia had improved after 1 wk, so erythropoietin was discontinued; other blood test results were normal. Systemic hypertension was initially managed with amlodipine maleate (Novalopine tab; JW Pharmaceutical Corporation, Dangjin, Chungnam, Korea), 0.3 mg/kg BW, PO, q12h, for 1 wk, but the hypertension was not controlled and increased over time to 180 mmHg. Therefore, an angiotensin II type 1 receptor blocker (ARB), telmisartan (Semintra; Boehringer Ingelheim Promeco, Mexico City, Mexico), 0.43 mg/kg BW, PO, q24h, was prescribed; blood pressure improved to 130 mmHg after 1 wk. The dog had no clinical signs at the 1-year follow-up, and blood pressure has been maintained in the normal range using telmisartan.

Discussion

This report describes the successful management of a renal cell carcinoma with surgical removal and supportive medical treatment. As the patient had unilateral renal carcinoma and the contralateral kidney was considered functional on the basis of blood tests and abdominal ultrasonography, nephroureterectomy was indicated.

Dogs with renal cell carcinoma sometimes show metastasis to lung, liver, regional lymph nodes, and local invasion into the surrounding structures (caudal vena cava, lumbar musculature, and adrenal glands) of the affected kidney (11,12). In our case, adhesion to the caudal vena cava and adrenal glands surrounding the affected right kidney was observed. In dogs with unilateral renal cell carcinoma, nephroureterectomy has been associated with a mean survival time of 16 mo (13), and 1 study suggests survival times of up to 4 y (14). Histopathologic evaluation showed that the mitotic index was < 10 and the patient was

Figure 2. Images of the right kidney with renal cell carcinoma. A — Enlarged and amorphic right kidney measuring 5.5 × 8 cm. B — Cross section of the right kidney. It was filled with fluid and there was no demarcation between the cortex and medulla. C — Pleomorphic, faintly basophilic, and occasionally vacuolated neoplastic cells invaded the right kidney. Normal architecture was extensively compressed. D — The caudal vena cava and surrounding tissues. Inflammation extended into the perivascular connective tissue and fat; neoplastic populations were observed.
expected to survive for about 1180 d (14). The patient has been followed for more than a year. This patient showed signs of complication after surgery, including azotemia, non-regenerative anemia, and systemic hypertension. Azotemia and anemia improved soon after initiation of supportive medical therapy, but the systemic hypertension was difficult to control. Though monitoring and management of systemic hypertension is important for patients with a unilateral kidney because they might have refractory hypertension caused by CRI (9,15). Essential or idiopathic hypertension is rare in cats and dogs compared with humans and systemic hypertension is most often associated with other diseases or conditions (16). Renal disease is the most common cause of hypertension in veterinary patients. As activation of the rennin-angiotensin-aldosterone (RAA) system is one of the main causes of hypertension in dogs with CRI, angiotensin-converting enzyme inhibitors such as benazepril and enalapril are usually recommended as the initial antihypertensive agents of choice (17,18). Combination therapy with different classes of antihypertensive agents is often necessary for dogs with refractory hypertension; these agents include calcium channel blockers, direct arterial dilators, and ARBs (19,20). In 1 study of ARBs, telmisartan was administered to a dog with persistent hypertension and proteinuria and the problems resolved successfully, but there are few reports of telmisartan in veterinary medicine (20). Telmisartan may have another benefit, as it can act as an anticancer agent (21,22). Telmisartan is thought to modulate the development and progression of cancer by selectively blocking the activation of angiotensin II type1 receptors (AT1Rs), thereby suppressing the RAA system. The RAA system signaling has been shown to increase cancer cell proliferation in malignancy by enhancing the activation of AT1R in malignant cells, which promotes pro-survival signaling and caspase activity (22,23). In human medicine, it is suggested that telmisartan is a potential agent for the prevention and treatment of renal cell carcinoma (24). A case report showed that 1487 human patients with renal cell carcinoma who received angiotensin system inhibitors had improved overall survival (25). It is also possible that renal cell carcinoma in dogs might be improved with administration of telmisartan, but additional studies are needed to determine its efficacy.

In conclusion, a case of canine renal cell carcinoma was successfully managed with medical therapy after surgery. To the authors’ knowledge, this is the first case of persistent systemic hypertension after nephroureterectomy in a dog that was controlled using telmisartan.

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References

Internal neurolysis of the maxillary branch of the trigeminal nerve for the treatment of equine trigeminal mediated headshaking syndrome

Chris Bell, Luke Hnenny, Kris Torske

Abstract — A 5-year-old Hannovarian warmblood gelding was presented for recurrent headshaking exacerbated with exercise. The horse displayed clinical signs of repetitive vertical head movements, face rubbing on the forelimbs and on the ground, repetitive sneezing, and striking the muzzle with his forelimbs. The clinical signs resulted in a horse that could not be ridden and was dangerous. Clinical signs were most persistent in direct sunlight, but occurred with excitement, exercise, or bridling indoors. A diagnosis of equine trigeminal mediated headshaking syndrome was made. Surgical treatment was performed with a supraorbital approach to the maxillary branch of the trigeminal nerve as it exits the round foramen, where an internal neurolysis (nerve combing) was conducted on both the left and right nerves. Severe headshaking behavior resolved after surgery. The horse displayed face rubbing of the muzzle which began 96 hours after surgery and resolved over 12 days with corticosteroid and vitamin E therapy. The horse became pasture sound and the clinical signs had resolved in the presence of sunlight, but repetitive vertical head movements persisted under saddle which left the horse unpleasant to ride.

Résumé — Neurolyse interne de la branche maxillaire du nerf trijumeau pour le traitement du syndrome équin de hochement de tête à médiation du trijumeau. Un hongre hanovrien warmblood âgé de 5 ans a été présenté pour un hochement de tête récurrent exacerbé par l’exercice. Le cheval a manifesté des signes cliniques de mouvements verticaux répétitifs de la tête, du frôlement de la face sur les jambes avant et sur le sol, des éternuements répétitifs et le frappement du museau avec les jambes avant. Les signes cliniques se sont traduits par un cheval qui ne pouvait pas être monté et était dangereux. Les signes cliniques étaient les plus persistants à la lumière du soleil directe, mais se produisaient lors d’un état d’excitation, de l’exercice ou avec la bride à l’intérieur. Un diagnostic de syndrome de hochement de tête à médiation du trijumeau a été posé. Le traitement chirurgical a été réalisé avec une approche supraorbitale à la branche maxillaire du nerf trijumeau au sortir du foramen rond, où une neurolyse interne (peignage des nerfs) a été effectuée sur les nerfs gauche et droit. Le comportement de hochements sévères de la tête s’est résorbé après la chirurgie. Le cheval a manifesté un frôlement de la face du museau qui a commencé 96 heures après la chirurgie et s’est résorbé pendant une période de 12 jours à l’aide d’une thérapie aux corticostéroïdes et à la vitamine E. Le cheval est devenu apte au pâturage et les signes cliniques se sont résorbés en présence de la lumière du soleil, mais les mouvements verticaux répétitifs de la tête ont persisté avec une selle, ce qui a rendu le cheval peu agréable pour la monture.

Headshaking syndrome in horses is a condition in which the horse displays several repetitive movements or clinical signs that generally include vertical (up and down) (89%) or less commonly, horizontal (side to side) head movements, face rubbing, or rubbing of the muzzle on the ground or forelimbs (75%), excessive snorting or sneezing (64%), striking its muzzle with the forelimbs or hind limbs, curling of the upper lip (Flehmen response), and an anxious expression or demeanor (61%) (1–5). Headshaking syndrome is most commonly seen in geldings over 9 y of age (range: 1 to 30 y, mean: 9 y) (2). Mills et al (6) showed a seasonal incidence of headshaking among 254 horses, with 64% of the horses showing a seasonal predilection for the months with the longest daylight. The 36% of the group which displayed non-seasonal headshaking, unlike the seasonal group, did not change the frequency of headshaking clinical signs based on sunlight or rain conditions, when indoors or at night (6). In another study, 59% of cases were found to be seasonally associated (spring to fall) with a sex predominance...
for geldings and breed predilection for thoroughbreds (7). Bright or sunny days were associated with headshaking in 18 of 31 (58%) of the cases in a study by Madigan and Bell (2). The headshaking clinical signs occurred in 10 of 31 (32%) of cases at exercise only (2).

Equine headshaking syndrome is thought to be analogous to a condition in humans called trigeminal neuralgia, a rare condition affecting 0.01% of the population and with a predilection for women. Clinical signs can be elicited with talking, eating, shaving, or exposure to direct sunlight, or having the wind blow against the face. It may present as a burning or throbbing pain or a lancinating and electrical pain in the face (8–10).

The pathophysiology of equine trigeminal mediated headshaking is not well-understood and several pathways or pathologies have been suggested including involvement of the trigeminal nerve (cranial nerve V) with altered transmission patterns (2, 11, 12), as well as decreased nerve threshold activation potential, suggesting trigeminal nerve hyperexcitability compared to a group of normal horses (13,14). There is a sex-predilection for geldings that has lead to gonadotropin-releasing hormone (GnRH) being investigated as a primary or supporting cause for trigeminal neuropathy. This theory was examined in horses via challenge with GnRH vaccination; however, this caused no significant improvement in horses diagnosed with headshaking syndrome (12). Grossly, the trigeminal nerve has been examined and found to be normal or having only mild changes such as mild lymphocytic infiltrates at the trigeminal root (13,14). Latent equine herpes virus 1 (EHV-1) infection within the trigeminal nerve was examined for correlation with headshaking and no support for the theory of postherpetic pain was found (15). Surgery of the paranasal sinuses and intraoperative trauma to the infraorbital nerve or canal have also been associated with the development of trigeminal neuritis and headshaking (16).

A broad list of differential diagnoses has been proposed for cases of headshaking in horses (5,17–23). The final diagnosis of trigeminal mediated headshaking syndrome is a diagnosis of exclusion in many cases. Diagnosis relies on thorough examinations, including general physical, ocular, oral, dental, and lameness examinations; upper respiratory endoscopy including examination of the gullet pouches; skull radiographs; observation of the horse in a darkened environment as well as under full exposure to sunlight or a bright environment (8); advanced imaging such as computed tomography (CT), magnetic resonance imaging (MRI), or nuclear scintigraphy; positive contrast paranasal sinusography (24) and nerve blocks of the infraorbital, mental, mandibular, and/or maxillary nerves. Infraorbital nerve blocks have not been found to be specific, with improvement in only 14% (5) and 18% (25) of cases. Mair et al (25) found that infraorbital nerve block resulted in worsening of the headshaking behavior in 8/19 horses. Maxillary nerve block via a ventral zygomatic arch approach showed significant improvement in 11/17 (4) and 23/27 (26) horses. Accuracy of maxillary nerve block and risks associated with the nerve block in relation to the vital structures in close proximity were evaluated with 80% of experienced clinicians having successful outcome compared to 40% of inexperienced clinicians (27). Risks of periorbital injection with resultant bulging of the eye and possible prolapse of the globe as well as risk of vascular puncture and subsequent marked retrobulbar hematoma have been described (28). An ultrasound-guided technique has been developed to improve accuracy and minimize the risk of complications from the nerve block (28).

Treatment options available for horses with trigeminal mediated headshaking syndrome include medical management with cyproheptadine alone [0.3 mg/kg body weight (BW), PO, q8h], which showed moderate improvement in 70% of horses (2); a combination of cyproheptadine (0.2 to 0.5 mg/kg BW, q8h), and carbamazepine (4 mg/kg BW, q6h), which showed improvement of 80% to 100% in 80% of cases in the study (4); and nose nets or masks, for which showed 75% of owners reported improvement (6). Corticosteroids, mast cell stabilizers, non-steroidal anti-inflammatory drugs (NSAIDs), and antihistamines have all been used without success (3,29,30).

Herbal supplements had no effect on headshaking in 1 study (31) and 2 horses benefited from permanent tracheostomy in another study (4). Surgical therapy options include infraorbital neurectomy with cryotherapy which resulted in 3/19 horses with long-term ablation of the clinical signs (25); chemical sclerosis of the infraorbital nerve within the rostral aspect of the infraorbital canal with phenol which resulted in 5/5 horses showing remission of clinical signs for 6 wk to 9 mo (4); caudal compression of the infraorbital nerve within the infraorbital canal with stacked platinum embolization coils which resulted in an initial successful outcome in 35/57 (63%) horses, but at 18-month follow-up success rate was 49% including horses that required more than 1 procedure or revision (26,32). Percutaneous electrical nerve stimulation (PENS) therapy has also been used in standing sedated horses with impulses delivered over the infraorbital nerve at 2 and 100 Hz alternating every 3 s for 25 min. Response to treatment was positive in 6/7 horses; however, repeated treatments were needed to maintain remission (33).

We postulated that a novel surgical approach to the trigeminal nerve at the level of the established maxillary nerve block location deep to the zygomatic process immediately cranial to the round foramen would allow for access to the most proximal portion of the trigeminal nerve without entering the calvarium. This would allow for ablation of the nerve’s sensory inputs from the face, muzzle, nose, sinuses, and maxillary tooth roots. This case report describes a novel approach to the maxillary branch (CN V2) of the trigeminal nerve at the level of the round foramen deep to the zygomatic process via a supraorbital approach to perform an internal neurolysis (nerve combing) and chemical ablation of the trigeminal nerves bilaterally as a salvage procedure to relieve the clinical signs of headshaking.

**Case description**

A 5-year-old Hannoverian gelding was presented with a 2-week history of acute onset of headshaking while being exercised, including movement of the head up and down, rubbing the face on the forelimbs, striking at the face with forelimbs, rubbing the muzzle on the ground when lunged, anxious demeanor, and periodic sneezing fits. The headshaking seemed to increase with intensity of exercise but was present even when bridling or at rest and the horse would strike dangerously at its own head and
become very difficult to control. Sunlight also intensified the episodes of headshaking.  

On examination, the horse had abrasions of the nose and lower lip from rubbing on the ground and inanimate surfaces. The clinical examination was otherwise unremarkable. The ophthalmic examination showed normal vision, pupillary light responses, menace response, anterior and posterior chambers. The horse was lunged in both left and right circles at a walk and trot. As the horse begun to lunge, he became agitated and shook his head in a highly repetitive vertical motion followed by repetitive face rubbing on the ground and his forelimbs. He could not be cantered as he became uncontrollable due to his repetitive headshaking. Taking him into sunlight further exacerbated the headshaking and he became uncontrollable. He could not be turned out in the sunlight and had to remain in the stable. Based on these findings, he displayed Grade 5/5 headshaking (4) (Table 1).

A dental examination revealed no abnormalities of the teeth, tongue, or oral cavity. Wolf teeth had been previously removed several years earlier and no remnants were seen. Upper airway endoscopy revealed no significant anatomical or functional abnormalities at rest. Radiographs of the skull showed no abnormalities of the tooth roots, sinuses, temporohyoid joint/ stylohyoid bone, poll, or calvarium. No fractures or bony changes were detected. No lameness was recognized at a walk or trot in the straight line or in either circle on a lunge line.

Bilateral infraorbital nerve blocks, mental nerve blocks, and maxillary nerve blocks were carried out as previously described (4,25,26). The mental and infraorbital nerve blocks did not provide relief of the clinical signs; however, maxillary nerve blocks significantly improved the clinical signs and allowed the horse to be exercised with minimal headshaking.

Our diagnosis was equine trigeminal mediated headshaking syndrome. Treatment was as follows. The horse was initially confined to a darkened stall and a nose mask and fly mask, which shaded the eyes, was worn daily for 6 wk. There was no outdoor turnout and hand walking in the arena occurred only if the horse was controllable. The horse remained difficult to control and could not be ridden, with progressively bizarre behaviors such as running at the stall door and walls in the presence of light over the course of 6 wk of conservative management. Medical and surgical management options were discussed with the owner. Although conservative medical management with medication was advocated, the owner was not interested in life-long medical therapy. The horse did not improve until nerve blocks at the level of the maxillary nerve were performed.

The current available surgical interventions would not have addressed pathology of the nerve at the maxillary nerve level; therefore, a novel procedure was proposed with consideration for the ethical and humane management of the horse in his current state. Euthanasia was considered.

The horse was admitted to hospital for surgery and anesthetized with xylazine (Rompun; Bayer Animal Health, Mississauga, Ontario), 0.5 mg/kg BW, IV, ketamine (Ketaset; Zoetics, Kalamazoo, Michigan, USA), 2.2 mg/kg BW, IV, butorphanol (Torbugesic; Merial Canada, Baie d’Urfe, Quebec), 0.02 mg/kg BW, IV, and guaifenesin 5% in lactated Ringers solution, IV, and maintained on isoflurane inhalation anesthesia. The horse was positioned on the surgical table in left lateral recumbency and the head was elevated with a positioning wedge pad to tilt the forehead upward at a 45° angle from the table surface. This allowed unrestricted access to both supraorbital spaces. The forehead from the level of the ears caudally to the level of the medial canthus cranially and abaxially to the level of the lateral canthus was clipped and aseptically prepared for surgery. A 5-cm semi-circular incision along the axial margin of the supraorbital space was made with a #10 scalpel blade, beginning at the abaxial cranial margin of the zygomatic process and continuing axially along the margin of the supraorbital fossa to finish at the caudal abaxial margin of the zygomatic process. The skin and subcutaneous tissue was reflected laterally to allow access to the supraorbital fat pad. The supraorbital fat was resected and removed with electrocautery and blunt dissection until the supraorbital space was clear of adipose tissue. An operating rigid endoscope (Arthrex, Naples Florida, USA) was placed into the fossa and into the retrobulbar space to provide illumination and visualize the neurovascular bundles emerging from the round foramen ventral to the orbital fissure. The pterygoid crest of the sphenoid bone can be digitally palpated and the location of the maxillary nerve is ventral and slightly cranial to this crest. The ethmoidal foramen will be first encountered at the dorsal aspect of the pterygoid crest then the optic canal will be within the sheath of the petriorbital and rectus muscles of the globe. A blunt probe and small retractor were used to dissect the maxillary branch of the trigeminal nerve from the surrounding nervous and vascular structures. The maxillary branch was identified as being continuous with the infraorbital nerve rostrally as it exited the maxillary foramen abaxial to the globe (Figure 1) and continued to the alar foramen caudally. Care was taken to isolate the maxillary nerve and avoid the maxillary artery, external ophthalmic artery, rostral deep temporal artery and caudal deep temporal artery which were all within the field of view (Figure 2). With the maxillary nerve isolated, a #11 scalpel was used to incise the nerve longitudinally over a 1-cm section (nerve combing) immediately cranial to the nerve exiting the round foramen in order to perform the internal neurolysis procedure. A chemical ablation of the nerve with 0.5 mL 70% ethanol was performed at the site of the internal neurolysis. The site was lavaged with sterile saline containing 10 million IU sodium penicillin (Pharmaceutical Partnership, Richmond Hill, Ontario) and checked to ensure hemostasis was maintained. The retrobulbar space was left and the deep subcutaneous tissue was closed with #2-0 Monocryl (Ethicon; Johnson & Johnson, Markham, Ontario) in a simple

<table>
<thead>
<tr>
<th>Grade</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intermittent and mild clinical signs; facial muscle twitching; rideable</td>
</tr>
<tr>
<td>2</td>
<td>Moderate clinical signs; definable conditions under which signs occur/develop; rideable with some difficulty</td>
</tr>
<tr>
<td>3</td>
<td>Rideable, but unpleasant ride and difficult to control</td>
</tr>
<tr>
<td>4</td>
<td>Unrideable; uncontrollable</td>
</tr>
<tr>
<td>5</td>
<td>Dangerous, with bizarre behavior patterns</td>
</tr>
</tbody>
</table>

Table 1. Clinical grading scale for severity of headshaking syndrome in horses (4).
continuous pattern and the subcuticular tissue was closed with #2-0 Monocryl (Ethicon; Johnson & Johnson) in a simple continuous pattern. The skin was closed with skin staples and the procedure was repeated with the other maxillary nerve. No hemorrhage was found at either site.

The horse recovered uneventfully from anesthesia and was returned to a darkened stall. The horse was administered phenylbutazone (Phenylbutazone 20%; Rafter 8 Products, Calgary, Alberta), 2.2 mg/kg BW, IV, q24h for 5 d, gentamicin sulfate (Gentamax; Phoenix, St. Joseph, Missouri, USA), 6.6 mg/kg BW, IV, q24h for 3 d, Ceftiofur (Excenel; Zoetis), 2.2 mg/kg BW, IV, q24h for 3 d, and omeprazole (Gastrogard; Mérial), 4 mg/kg BW, PO, q24h for 14 d.

At 96 h post-surgery, the horse began displaying face rubbing behavior and proprioceptive deficits with the muzzle in his inability to locate his feed bucket without bumping into it before prehending and eating his feed normally. This progressed to inappetence and apprehension when eating which lasted for 4 d before resolution. The face rubbing resolved within 12 d. Treatment for the face rubbing behavior consisted of vitamin E (WN Pharmaceuticals, Coquitlam, British Columbia), 12 IU/kg BW, PO, q24h for 30 d and dexamethasone (Dominion Veterinary Labs, Winnipeg, Manitoba), 0.05 mg/kg BW, IV, q24h for 14 d then 0.025 mg/kg BW, IV, q24h for 7 d.

With the resolution of the face rubbing behavior, the horse became calmer and the headshaking was not present during the first 60 d after surgery. The horse was maintained indoors for the first 30 d after which he was given 12 h outdoor turnout daily. Around 60 d, the horse displayed intermittent headshaking and a mild intermittent facial twitch on the left side of the face. When exercised, he displayed mild headshaking and was rideable with some difficulty. He was graded as a Grade 1 to 2 headshaking on Newton’s scale (4). He was able to tolerate sunlight without violent headshaking; however, he retained a loss of proprioception with his muzzle and frequently caused abrasions to the muzzle, upper lip, and nose by bumping into his feed pail/manger and stall door when awaiting food. The owner also noted that he seemed to have lost his normal flight zone around his nose and would frequently bump into the handler with his nose. At 6 mo after surgery, the clinical signs had stabilized and were the same as at the 60-day post-surgery follow-up with a Grade 1 to 2 headshaking syndrome (4); however, he was not able to be ridden as a performance horse in the hunter/jumper arena. The horse was euthanized at 6 mo after surgery due to financial constraints and the head was sent for postmortem evaluation. The pathologist reported no anatomical variations of the trigeminal nerves or the brain. Histological
findings consisted of 2 tiny foci of gliosis immediately adjacent to a lateral ventricle, a small collection of lymphocytes in 1 small portion of the choroid plexus and 2 capillaries with swollen endothelial cells in different locations. No histological or gross pathological cause for the headshaking could be found.

Discussion

Idiopathic headshaking syndrome or equine trigeminal mediated headshaking syndrome is a poorly understood condition of the horse postulated to be due to inflammation or irregular nerve conduction of the trigeminal nerve(s). The horse in this report displayed classical signs of headshaking syndrome and was severely affected. This horse was younger than the mean age of onset of 9 y and the onset of the condition was reportedly acute. No trauma or other known cause triggered the onset of clinical signs and no gross anatomical or physiological abnormalities were found on the clinical examination or diagnostics to identify a cause for the onset of clinical signs.

Diagnostic nerve blocks have been cited in the literature as being useful in identifying the trigeminal nerve as the source of headshaking, which was the case with this horse as well. Infraorbital and mental nerve blocks did not improve the headshaking activity; however, anesthesia of both maxillary nerves via a ventral zygomatic process approach (28) ameliorated the headshaking. Medical treatment options have shown promise in remission of clinical signs in some horses but require life-long therapy with psychoactive medications such as carbamazepine and are associated with variable remission periods (3–5). In this case, the owner elected to forego medical management as the horse was desired to perform and restrictions do not allow the use of these medication in competing horses. Use of a nose mask resulted in increased display of the headshaking clinical signs. A full fly mask which darkened the eyes but did not cross the level of the infraorbital foramen in combination with a darkened stall was successful in lessening the clinical signs; however, the horse became dangerous again once exposed to sunlight, bridled, or agitated (presumably increases in blood pressure).

Surgical management of trigeminal mediated headshaking includes infraorbital neurectomy, chemical sclerosis, or cryotherapy of the infraorbital nerve within the canal or caudal compression facilitated necrosis of the infraorbital nerve within the infraorbital canal and, most recently, percutaneous electrical nerve stimulation (PENS) (4,25–26,32–33). While phenol chemical sclerosis of the infraorbital nerve within the canal produced the highest success rate with 5/5 horses showing remission of clinical signs for 6 wk to 9 mo, repeated therapy would be required to maintain this remission and nerve damage may occur which could result in deafferentation nerve pain, although this was not reported (4). Caudal compression of the infraorbital nerve within the infraorbital canal with platinum embolectomy coils results in facilitated necrosis of the infraorbital nerve immediately rostral to the maxillary foramen within the infraorbital canal. During the study, several of the coils migrated and needed to be replaced and serious self-traumatizing face rubbing occurred in 63% of the horses after surgery as a significant complication resulting in 4 horses being euthanized (26). Infraorbital neurectomy results in a high complication rate with 85% of horses in the studies published having serious face rubbing lasting 3 to 8 wk and only 15% of horses achieving remission of clinical signs (25). Percutaneous electrical nerve stimulation appears to be a viable option for treatment, with 86% of horses achieving remission; however, repeated therapy at multiple intervals is required to maintain remission (33). Unlike medical management, PENS does not represent a competition medication exclusion (33).

In humans, the source of trigeminal neuropathy/neuritis/neuralgia is often vascular compression by the superior cerebellar artery against the trigeminal nerve root as it exits the brain stem. It is postulated that changes in blood pressure and compression of the vessel against the nerve results in neuritis or abnormal nerve transmission which causes the pain associated with trigeminal neuralgia in humans. Trigeminal neuritis tends to affect women more than men and occurs most commonly in patients 50 to 60 y old. It is also often unilateral with the right side of the face more commonly affected than the left (8–10). Although no direct comparison can be made in horses and other animals due to the lack of vascular brain base contrast studies, it stands to reason that given the blocking pattern in the horse, the source of the neuritis may not be in the infraorbital canal and may be located caudal to the round foramen at the level of the trigeminal ganglion or as in humans, at the level of the trigeminal nerve root as it exits the pons and before it enters Meckel’s cave. In humans, several surgical options are available such as microvascular decompression, percutaneous glycerol rhizotomy, percutaneous radiofrequency ablation, trigeminal balloon microcompression, stereotactic radiosurgery, and peripheral neurectomy (10). Microvascular decompression has the highest success rate and directly addresses the pathology. The procedure involves a brain base approach and identification of the superior cerebellar artery where it is in intimate contact with the trigeminal nerve root. The artery is dissected from the nerve root and a Teflon pledget is place between the artery and nerve to insulate the nerve from the artery (10).

In the horse, this approach is complicated by the potential approaches to the brain base and the limited access to the brain base due to the location of the vertical ramus of the mandible, temporomandibular joint, guttural pouches, and parotid gland (34). The most proximal portion of the trigeminal nerve that can be accessed in the horse is at the site of the maxillary nerve immediately rostral to the nerve exiting the round foramen in the retrobulbar space. This is the location at which the maxillary nerve block is performed in the horse (28,35). Based on this anatomical and clinical information, an approach to the trigeminal nerve at this location would seem to be a logical location to surgically interrupt the nerve transmission thought to be associated with trigeminal mediated headshaking in the horse. In this case, a supraorbital approach to the maxillary branch of the trigeminal nerve (CN V2) was used. This approach avoids the large vessels present in a lateral approach, such as the maxillary artery and vein and the transverse artery and vein which lie directly over the location of the nerve under the zygomatic process (28,34). Using the supraorbital approach, the supraorbital and retrobulbar adipose tissue is removed and minimal vasculature and nervous tissue is encountered or disrupted with
careful dissection. The pterygoid crest can be palpated digitally or visualized with a rigid endoscope and the neurovascular bundle emerging from the alar and round foramen can be seen and palpated. Great care must be taken to avoid damaging the neurovascular bundles including the optic nerve and associated vasculature within the periorbital tissue; however, the trigeminal nerve (maxillary branch of the trigeminal nerve) can be isolated from the surrounding vascular and nervous tissues and elevated with a probe to expose approximately 1 cm of nerve for neurolysis. The purpose of internal neurolysis is to not transect the nerve but rather incise and separate the nerve bundle along the long axis of the nerve which will decrease conduction intensity and speed and result in significant slowing of nerve transmission and hence nerve associated pain. The nerve bundle will scar and heal with a larger cross-sectional area which will maintain the decrease in nerve transmission and provide relief of the sensory associated nerve pain into the brainstem (9). Furthermore, we also performed a local chemical sclerosis of the trigeminal nerve at the most proximal aspect of the isolated nerve bundle with ethanol. This was done to decrease nerve sensory input by disruption of the axon and axon membrane via dehydration of the tissue with the ethanol (10). The nerve blocks required both left and right maxillary nerves to be anesthetized before the clinical signs ceased. For this reason, we elected to perform the procedure bilaterally.

The main complication after surgery in this case was face rubbing which began at 4 d after surgery and lasted approximately 12 d before resolution. This is similar, but shorter in duration, to the deafferent nerve pain response seen in previous studies (25–26,32). The face rubbing behavior was managed with vitamin E supplementation and dexamethasone corticosteroid therapy over 14 d, but this may have been self-limiting regardless of therapy. The horse also developed inappetence which lasted about 4 d, during which time the horse was reluctant to use the upper lip to prehend feed and seemed to have an adverse sensory reaction to contact of the muzzle with his feed and/or his feed or water pail. He ate his feed and drank water, but had an anxious expression and a mild facial twitch developed when doing so. We postulate that there was some deafferent nerve pain during this time which may have been associated with inflammation at the nerve surgery site. This resolved over 4 d and he resumed normal feed and water intake. In addition, between 45 and 60 d, the horse began to develop mild headshaking clinical signs again as well as a mild facial twitch on the left side of the face/muzzle. He seemed to also lack proprioception with his muzzle, nose, and upper lip. He bumped into inanimate objects with his nose and seemed to prehend his feed with his incisors rather than his upper lip before taking feed into his mouth. This is likely due to the lack of or delay in sensory transmission from the trigeminal nerve, as would be expected. His vision was assessed and found to be normal with normal pupillary light responses and menace responses in both eyes. The surgical sites healed without complication and no significant abnormalities of the supraorbital space were detected.

There was significant improvement in the clinical outcomes from a Newton Grade 5 to Grade 1 to 2 after surgery. The horse was rideable with difficulty due to the headshaking that persisted at 6 mo after surgery; however, the horse was markedly improved from the dangerous state he had presented and was now comfortable outdoors in sunlight as well as when being handled. Although this only represents a single case, we believe this surgical approach could be considered as a salvage procedure in horses with severe trigeminal mediated headshaking syndrome in which the clinical signs are best alleviated with a maxillary nerve block.

Acknowledgments

We thank Dr. Henry O’Neill at Donnington Grove Veterinary Group for permission to use a photograph (right photo Figure 2). We are grateful to Sara Haddow and Jillian Overby for assistance with care of the horse after surgery.

References

21. Blanke A, Fischer ML, Fuchs M, Schusser GF. Endoscopic findings of the external ear canal in a group of clinically normal horses and
Textbook of Veterinary Internal Medicine, 8th edition


Still considered the “gold standard” since its first publication in 1975, the Textbook of Internal Medicine by Ettinger, Feldman, and Côté, is a wealth of information for veterinary internal medicine. With the addition of 3rd editor, Dr. Côté, the 8th edition offers 360 complete chapters contributed by 340 authors, in both text and digital format, and compatible with desktop computer, laptop, tablet, and smartphone devices. Algorithms are provided in almost every chapter, while 500 videos have been carefully chosen to best support learning. Chapters are organized by clinical medicine but also reflect the clinical thought process, outlining differential diagnoses and diagnostic testing, and updated information and a greater cohesiveness between chapters. Material is written in a clear, user friendly manner and divided into easily manageable subsections. There is a plethora of figures, mostly presented in colour. Despite covering over 2000 pages in 2 volumes, this text is a pleasure to explore.

As the editors point out, when this text was first published, a mouse remained a small rodent, while today it is also represents a gateway to a wide offering of material on the digital side. This includes additional figures, pictures, diagrams, client information material, and videos. A QR code can be found at the end of every chapter linking the reader to a reference section online, often including a direct link to PubMed. The extent of material offered digitally shows clearly that the editors understand changing preferences for study and the need for more than a dusty text on a shelf. Overall, this 2-volume set remains a primary “go to” resource for veterinary internal medicine problems and a true benchmark for what an excellent textbook looks like.

Reviewed by Janeen Junaid, DVM, MVSc, Locum/Associate Small Animal Veterinarian, Hamilton and surrounding area, Ontario.
A pilot study of *Coxiella* seroprevalence in occupationally exposed individuals in the Peace River region of Alberta and British Columbia

Ilona Houston, Christy Barlund, Lynora Saxinger, Heidi Wood, Stan Houston

**Abstract** — A pilot seroprevalence study was performed among asymptomatic occupationally exposed individuals in June, 2016 in the Peace River region of Alberta and British Columbia. Five of 40 subjects — 3 of 24 small ruminant producers, 1 of 14 abattoir workers, and 1 of 2 veterinarians had evidence of *Coxiella* exposure. More systematic surveillance and more active promotion of biosecure husbandry methods should be considered.

**Résumé** — Étude pilote sur la séroprévalence de *Coxiella* chez les personnes exposées en milieu de travail dans la région de la rivière de la Paix en Alberta et en Colombie-Britannique. Une étude pilote sur la séroprévalence a été réalisée parmi les personnes asymptomatiques exposées en milieu de travail en juin 2016 dans la région de la rivière de la Paix en Alberta et en Colombie-Britannique. Cinq des 40 sujets — 3 de 24 producteurs de petits ruminants, 1 de 14 travailleurs d’abattoir et 1 de 2 vétérinaires, présentaient des signes d’exposition à *Coxiella*. Une surveillance systématique accrue et une promotion plus active de méthodes d’élevage biosécuritaires devraient être considérées.

Can Vet J 2018;59:770–772

**Introduction**

*Coxiella burnetii*, the cause of Q fever, infects a wide range of mammalian hosts worldwide. It usually causes sporadic infections in humans following exposure to herd animals, particularly small ruminants, although large outbreaks have been described (1). In contrast with other pathogenic agents associated with animal husbandry, *Coxiella* is rarely transmitted to humans through milk or meat products, but is most often acquired via airborne transmission of the environmentally hardy spores. Producers rather than consumers are likely to be at greatest risk of infection but other risk groups include abattoir workers, in whom the disease was first recognized, and veterinarians or other individuals in proximity to parturient small ruminants, may also be exposed (2). Birth products are the most infectious source, which implies an opportunity for reduction of transmission risk by focusing on interventions or precautions during lambing or kidding. Human infection is most commonly asymptomatic, but can result in a symptomatic self-limiting febrile illness, pneumonia, hepatitis, or less commonly, endocarditis which is associated with a high case fatality rate in the absence of prolonged antimicrobial therapy.

In small ruminant production, the main problematic outcome of Q fever infection is abortion, so the disease is thought to be most often recognized in a herd following an “abortion storm.” However, as transmission through milk or meat is not commonly recognized, it has not been a priority for public health or food safety in Alberta.

Infectious disease physicians in Edmonton see sporadic human cases of this infection, usually in association with sheep or goat husbandry. The infection is reportable in humans in Alberta under The Public Health Notifiable Disease Management Guidelines. To our knowledge, there has never been any form of systematic surveillance of this infection in humans or small ruminants in Alberta, although relatively high estimates of prevalence have been found in producers and veterinarians in small studies in Ontario and Nova Scotia (3–5) and seroprevalence was 14.7% among 2363 sheep on 72 Ontario farms (6).

Following a severe case of human infection that required hospitalization, biopsy of the liver, and weeks of disability, associated with exposure to a lambing barn in the Peace River area, we received a request for information from local producers. We were unable to provide local prevalence data, so in discussion with the producers, we agreed to carry out a pilot survey among individuals likely to be at risk of exposure in the region.

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Table 1. Characteristics of seropositive subjects.

<table>
<thead>
<tr>
<th>Case number</th>
<th>Session</th>
<th>Gender</th>
<th>Comments</th>
<th>Laboratory results</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Abattoir worker</td>
<td>F</td>
<td>Involved in slaughter, estimated 100/year over 5 years. Not involved with lambing/kidding.</td>
<td>Phase II 1:64, Phase I 1:64</td>
</tr>
<tr>
<td>15</td>
<td>Producer meeting 1</td>
<td>F</td>
<td>Directly involved in lambing: 150 head, lambed out 225/year in barn. Slaughter 1/year.</td>
<td>Phase II 1:32</td>
</tr>
<tr>
<td>21</td>
<td>Producer meeting 1</td>
<td>M</td>
<td>Contact with small ruminants outside Alberta. Average herd size 100. Estimated number of kids 200/year both in barn and outside.</td>
<td>Phase II 1:32, Phase I &lt; 1:32</td>
</tr>
<tr>
<td>32</td>
<td>Producer meeting 2</td>
<td>F</td>
<td>Average herd size 150, reporting 200 to 300 lambed out/year in barn.</td>
<td>Phase II 1:128, Phase I &lt; 1:32</td>
</tr>
</tbody>
</table>

Ethics approval was obtained from the University of Alberta Research Ethics Board, and each volunteer provided signed, informed consent.

Materials and methods

In June 2016, blood samples were collected from volunteers at 2 local meetings of small ruminant producers in the Peace River region of northern Alberta (AB) and British Columbia (BC) (each of which was also attended by 1 local veterinarian) and from employees at 1 abattoir. Participants filled out a questionnaire detailing their history of exposure to small ruminants, including their involvement with animal husbandry and production, slaughter, or birthing activities in the region.

Serum was tested by both immunofluorescence antibody assay (IFA) and enzyme-linked immunosorbent assay (ELISA) at the National Laboratory for Microbiology in Winnipeg. Serum samples were tested using the Focus Diagnostics Q fever IFA IgG kit (Bio Nuclear Diagnostics, Toronto, Ontario) and the Panbio *Coxiella burnetii* (Q fever) IgG ELISA (Alere, Ottawa, Ontario) as recommended by the manufacturers. Samples were screened at a titer of 1:32 by the IFA to both phase I and II antigens (Nine Mile strain) and titered to endpoint. The wells of the Panbio ELISA plates are coated with phase II antigen only (strain not specified). Samples with a titer of $\geq 32$ to phase II antigen by the IFA were considered seropositive — all of these samples also tested positive on the ELISA (Panbio units of $> 11$).

Results

Forty volunteers participated in this pilot study: 10 and 16, respectively from the 2 meetings of producer groups in the Peace River region, in Tower Lake BC and Rycroft AB; and 14 from an abattoir in Grande Prairie that processes sheep and goats.

Twenty-two producers reported raising sheep only, 8 sheep and goats, and 1 producer raised goats only. Sixteen of the 24 who raise goats and/or sheep reported using barns for kidding/lambing. Nine participants reported contact with small ruminants outside of AB or BC: 4 from Ontario, 2 from Hawaii, 1 from Manitoba, 1 from Germany and 1 from both Manitoba and Ontario.

Thirteen samples tested positive or equivocal by ELISA, but only 5 (12.5%; 95% confidence interval (CI) 4.2 to 26.8) of these samples also tested positive on the IFA, which is considered the gold-standard for the detection of antibodies to *Coxiella burnetii*.

The 5 subjects which were positive by both IFA and ELISA, indicating past exposure to *C. burnetii*, comprised 1 of 14 abattoir workers (who did not report lambing/kidding exposure), 1 of 2 veterinarians (who had exposure to lambing and kidding but not slaughter and was not a producer), and 3 of 24 producers. All 3 producers with positive serology reported lambing/kidding indoors. None reported being tested for Q fever previously (Table 1).

All seropositive subjects were contacted by phone to be informed of their test results and none gave a history concerning for the presence of chronic Q fever. The serologic pattern of response to phase 1 and 2 antigens was not suggestive of chronic infection in any patient. None of the patients had a history of valvular heart disease. Where permission was given, the results were also shared with their family doctor.

Discussion

In the province of Alberta, there has been an average of fewer than 3 reported human cases of *Coxiella* per year over the last 15 y, with considerable year-to-year variation (7). By contrast, based on our relatively small sample, evidence of *Coxiella*
exposure appears to be common among individuals with occupational exposure risk in the Peace region of northern Alberta and British Columbia. Of note, positives were found at each of the 3 locations visited and in producers and appendicular industry workers (1 abattoir worker, 1 veterinarian), suggesting that the infection is not limited to 1 geographic area or occupation. This apparent discrepancy between our findings and the numbers of reported cases may be explained by the high proportion of infections which are unrecognized because they are asymptomatic or self-limited, and by under-diagnosis of symptomatic illness due to lack of awareness on the part of both patients and doctors. While it is less likely that the diagnosis of rare, life-threatening manifestations of Q fever would be missed, our findings suggest a substantial level of transmission and a significant burden of unrecognized morbidity (8,9).

In conversation with participants at the 2 producer meetings and at the abattoir, there appears to be relatively little awareness of Q fever among individuals at risk of exposure. Misunderstandings involved not only lack of awareness of the predominant airborne route of transmission, but also unjustified concern about the possibility of government imposed herd health interventions analogous to those applied for Mycobacterium bovis or Brucella.

One limitation of this study was the small number of samples and the convenience sampling of self-selected volunteer participants that was used. Also, due to a miscommunication with the microbiology laboratory and the logistic constraints of blood collection in rural, non-institutional settings, specimens were hemolyzed. The National Microbiology Laboratory estimated that the presence of hemoglobin in the samples is likely to have reduced the sensitivity of testing, potentially by half. Finally, laboratory diagnosis of Q fever is dependent on Coxiella serology and results of microimmunofluorescence assays have been found to be subject to variation among different laboratories (10).

Current knowledge of the status of human Coxiella infection in Alberta is rudimentary at best. Since producers are likely to be the group at greatest risk, expanded, more systematic surveillance of this group would be a logical next step. Interest on the part of producer groups and collaboration with provincial health ministries would be critical to an effective surveillance of this group would be a logical next step. Interest on the part of producer groups and collaboration with provincial health ministries would be critical to an effective surveillance of this group would be a logical next step. Interest on the part of producer groups and collaboration with provincial health ministries would be critical to an effective surveillance of this group would be a logical next step. Interest on the part of producer groups and collaboration with provincial health ministries would be critical to an effective surveillance of this group would be a logical next step. Interest on the part of producer groups and collaboration with provincial health ministries would be critical to an effective surveillance of this group would be a logical next step. Interest on the part of producer groups and collaboration with provincial health ministries would be critical to an effective surveillance of this group would be a logical next step. Interest on the part of producer groups and collaboration with provincial health ministries would be critical to an effective surveillance.

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Current knowledge of the status of human Coxiella infection in Alberta is rudimentary at best. Since producers are likely to be the group at greatest risk, expanded, more systematic surveillance of this group would be a logical next step. Interest on the part of producer groups and collaboration with provincial health ministries would be critical to an effective surveillance strategy. Decisions regarding more systematic surveillance in herd animals will be affected by the perceived priority on the part of veterinary and agricultural services.

Education, perhaps delivered through producer organizations and local veterinary services, to raise awareness of the importance of biosecurity measures, including personal protective equipment, hygiene practices and enhanced ventilation if lambing or kidding is taking place indoors, and in slaughterhouse environments, could contribute to reduced occupational exposure. Producers should be encouraged to notify local veterinary services if increased abortions are noted in their flock, to enable testing of birth products (placenta and fetuses) by the veterinary reference laboratory. Antibiotic therapy is not effective for reducing shedding in infected animals; however, an effective vaccine (Coxevax; CEVA Animal Health, Lenexa, Kansas, USA) is available for import to Canada under a special Biological Import Certificate. Raised awareness of this infection among individuals with occupational exposure and their physicians could lead to a higher rate of recognition of symptomatic illness episodes and timely diagnosis and treatment. Q fever exemplifies the need to adopt a One Health approach.

References
Article

Effect of routine pre-anesthetic laboratory screening on pre-operative anesthesia-related decision-making in healthy dogs

Krista Mitchell, Michele Barletta, Jane Quandt, Molly Shepard, Stephanie Kleine, Erik Hofmeister

Abstract — The usefulness of pre-anesthetic laboratory screening of healthy veterinary patients is controversial and clear evidence-based guidelines do not exist. The purpose of our study was to determine the influence of pre-anesthetic laboratory screening on peri-anesthetic plans in canine patients undergoing elective surgery. One hundred medical records were randomly selected between the years 2008 and 2013 and patient information was presented to 5 Diplomates of the American College of Veterinary Anesthesia and Analgesia (ACVAA) for review. They were given pre-anesthetic laboratory screening test results for each patient and asked whether the results would change the way they managed the case from an anesthesia perspective. Peri-operative anesthetic management was altered in 79% of patients based on pre-anesthetic screening results; however, the overall agreement among anesthesiologists was weak with 64% of changes made by only a single anesthesiologist. Pre-anesthetic laboratory screening test results may influence pre-operative anesthesia case management but major discrepancies can occur among ACVAA diplomates.

Résumé — Effet du dépistage de laboratoire pré-anesthésique de routine sur la prise de décisions préopératoires liées à l’anesthésie chez des chiens en santé. L’utilité du dépistage de laboratoire pré-anesthésique des patients vétérinaires en santé est controversée et des lignes directrices claires basées sur des données probantes n’existent pas. Le but de notre étude consistait à déterminer l’influence du dépistage de laboratoire pré-anesthésique pour la péri-anesthésie chez les patients canins subissant une chirurgie non urgente. Cent dossiers médicaux choisis au hasard entre les années 2008 et 2013 et des données sur les patients ont été présentés à cinq diplomates de l’American College of Veterinary Anesthesia and Analgesia (ACVAA) aux fins d’examen. On leur a donné les résultats des tests de dépistage de laboratoire pré-anesthésiques pour chaque patient et on leur a demandé d’évaluer si les résultats auraient modifié la façon dont ils auraient géré le cas du point de vue de l’anesthésie. La gestion anesthésique péri-opératoire a été modifiée chez 79 % des patients en se basant sur les résultats du dépistage pré-anesthésique. Cependant, le consensus général parmi les anesthésiologistes était faible avec 64 % des changements apportés par seulement un seul anesthésiologiste. Les résultats des tests de dépistage de laboratoire pré-anesthésiques peuvent influencer la gestion des cas d’anesthésie préopératoire mais des écarts majeurs peuvent se produire parmi les diplomates de l’ACVAA.

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Introduction

A good history and thorough physical examination are the main components of assessment of health prior to general anesthesia and surgery. The goal is to understand and decrease the risk of morbidity and mortality associated with anesthesia.

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Several studies in human anesthesia (1–8) and a few studies in veterinary medicine (9–13) question the necessity for pre-anesthetic laboratory testing in healthy patients as part of the pre-operative assessment.

Pre-anesthetic laboratory screening, defined as a complete blood (cell) count (CBC), serum biochemistry, and urinalysis (UA), is performed to detect subclinical disease such as hypoproteinemia and anemia that may affect how the patient responds to anesthesia (14). Abnormal test results may influence anesthesia-related case management decisions that could improve overall quality of care for the patient. Another purpose is to establish baseline values for future testing.

Disadvantages of pre-anesthetic laboratory screening of healthy patients include cost, patient stress, additional potentially risky and unnecessary tests, delay of surgical procedures and potentially harmful treatments with questionable significance. It has been estimated that a human hospital could save
$80,000 US annually if pre-anesthetic tests deemed unnecessary were eliminated (8).

In the human medical literature, pre-anesthetic screening in apparently healthy patients is not recommended as it has not been shown to predict perioperative complications, change patient management, or affect outcome (1–5,7,15–18). Further studies in human medicine have shown that a large amount of money could be saved if such tests were eliminated, although the practice of routine pre-anesthetic testing is difficult to change with general surgeons being more likely than anesthesiologists to order unnecessary tests (6,8).

In the veterinary literature, fewer studies exist and the usefulness of pre-anesthetic laboratory screening in apparently healthy patients is less clear. One study found subclinical disease that resulted in modification of the anesthetic plan in 4% of cats and 3% of dogs with no clinical signs due solely to abnormal pre-anesthetic laboratory test results (12). Pre-procedural laboratory screening has been recommended ideally within 2 wk of anesthesia in all senior dogs and cats (19) and a CBC and total plasma protein determination have been recommended in all horses prior to general anesthesia (20). Other veterinary studies have concluded that pre-anesthetic laboratory screening results often had little clinical relevance and did not prompt major changes to the anesthetic protocol in healthy patients (9,10,13). The Association of Veterinary Anesthetists (AVA) voted in 1998 to declare that routine pre-anesthetic screening is unnecessary if the clinical examination was adequate (21).

The American Society of Anesthesiologists (ASA) grade is used to categorize the health status of a patient prior to undergoing general anesthesia. Pre-anesthetic screening may detect abnormalities that would reclassify a patient as a higher ASA grade, which has been associated with increased odds of anesthetic death (22–26). A change from ASA I or II to ASA III was found to increase risk of anesthetic death by 6.6-fold (24). Higher risk patients may require more extensive perioperative management and monitoring.

There are many anesthesia-related case decisions besides drug protocol that can improve patient quality of care while under general anesthesia. Only a handful of decisions, notably a change in drug protocol, have been addressed in previous veterinary studies (9,10,13). The objective of this study was to determine if routine pre-anesthetic laboratory screening, including CBC, biochemistry, and urinalysis (UA), provided information that might change the anesthetic management of the patient. The hypothesis was that pre-anesthetic laboratory screening in apparently healthy dogs would detect abnormalities leading to alteration of the patient’s peri-operative anesthesia-related case management from the usual standard anesthetic management for a healthy patient at the University of Georgia Veterinary Medical Center (UGA VMC).

### Materials and methods

The clinical record of all dogs presenting to the UGA VMC between the years 2008 and 2013 were screened retrospectively, out of which 29,488 patients had CBC, serum biochemistry, and urinalysis (UA) performed. Of these, 945 dogs underwent elective orthopedic surgical procedures, had no evidence of concurrent disease, and had pre-operative blood analysis performed purely to satisfy the hospital’s established protocol. One hundred medical records were randomly selected and information including patient’s age, weight, breed, presenting complaint/diagnosis, and surgical procedure was presented to 5 Diplomates of the American College of Veterinary Anesthesia and Analgesia (ACVAA) for independent review. They were given pre-anesthetic screening test results for each patient and asked whether the results changed the way they would manage the case in the peri-operative period from an anesthesia perspective (Table 1). A change was defined as a change from the standard of care at the UGA VMC for a healthy patient undergoing elective orthopedic procedures. Standard monitoring includes capnography, pulse oximetry, electrocardiography, noninvasive blood pressure, temperature, pulse rate, and respiration rate. Mean arterial blood pressure is maintained above 60 mmHg and systolic arterial blood pressure is maintained above 90 mmHg. Fluid therapy consists of lactated Ringers solution at a rate of 5 mL/kg body weight (BW) per hour and all patients undergoing orthopedic surgical procedures receive a non-steroidal anti-inflammatory drug (NSAID) and an epidural injection of morphine (0.1 mg/kg BW) and bupivacaine (0.5 mg/kg BW) if indicated for the procedure. Healthy patients are not routinely pre-oxygenated before induction and further hematological testing such as checking blood glucose levels at the time of anesthesia are not performed unless indicated. All patients included in the study were considered to be a baseline ASA grade of 1 or 2 prior to pre-anesthetic laboratory screening test results based on history and physical examination findings from the medical record. A change in ASA grade was defined as a change based only on pre-anesthetic laboratory test results.

### Table 1. Questions to anesthesiologists regarding anesthesia case management based on pre-anesthetic screening results.

<table>
<thead>
<tr>
<th>Question</th>
<th>Anesthesiologists (%</th>
<th>Cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would you postpone or cancel the surgery?</td>
<td>100</td>
<td>3</td>
</tr>
<tr>
<td>Would you repeat the blood work?</td>
<td>≥ 80</td>
<td>9</td>
</tr>
<tr>
<td>Would you change the patient's ASA Grade?</td>
<td>≥ 60</td>
<td>32</td>
</tr>
<tr>
<td>Would you change fluid therapy?</td>
<td>≥ 40</td>
<td>48</td>
</tr>
<tr>
<td>Would you change the monitoring equipment used?</td>
<td>≥ 20</td>
<td>79</td>
</tr>
<tr>
<td>Would you perform further diagnostic testing (i.e., coagulation testing or ultrasound)?</td>
<td>0</td>
<td>21</td>
</tr>
</tbody>
</table>

### Table 2. The percentage of anesthesiologists who believed that 1 or more changes should be made to anesthesia-related case management of 100 healthy dogs due to abnormal pre-anesthetic screening laboratory test results.

<table>
<thead>
<tr>
<th>Anesthesiologists (%)</th>
<th>Cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>3</td>
</tr>
<tr>
<td>≥ 80</td>
<td>9</td>
</tr>
<tr>
<td>≥ 60</td>
<td>32</td>
</tr>
<tr>
<td>≥ 40</td>
<td>48</td>
</tr>
<tr>
<td>≥ 20</td>
<td>79</td>
</tr>
<tr>
<td>0</td>
<td>21</td>
</tr>
</tbody>
</table>
Table 3. The most common blood analysis abnormalities.

<table>
<thead>
<tr>
<th>Abnormality</th>
<th>Cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High mean platelet volume</td>
<td>60</td>
</tr>
<tr>
<td>Low mean corpuscular volume</td>
<td>54</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>20</td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td>19</td>
</tr>
<tr>
<td>High alkaline phosphatase</td>
<td>17</td>
</tr>
<tr>
<td>Hypophosphatemia</td>
<td>17</td>
</tr>
<tr>
<td>Hyperglycemia</td>
<td>16</td>
</tr>
<tr>
<td>Thrombocytopenia</td>
<td>14</td>
</tr>
<tr>
<td>Hyperalbuminemia</td>
<td>14</td>
</tr>
<tr>
<td>Hypermagnesemia</td>
<td>13</td>
</tr>
</tbody>
</table>

American Society of Anesthesiologists grades were defined according to a previously described ASA grading scale with an ASA grade of I representing a normal healthy patient and an ASA grade of II representing a patient with mild systemic disease such as a localized infection or fracture without shock (14). The interpretation of test results was based on the normal range of values recommended by the UGA VMC laboratory. Pre-anesthetic screening was defined as CBC, serum biochemistry, and UA.

Agreement between anesthesiologists on changes made to anesthesia-related case management was assessed using Fleiss’ kappa (κ). Significance was set at alpha < 0.05. Kappa is a measure of agreement on a scale of -1 to 1. A value of 1 indicates perfect agreement, 0 indicates agreement expected by chance, and negative values indicate agreement less than chance (27).

Results

One hundred dogs with a median weight of 32.4 kg [interquartile range (IQR) = 21.2 to 41.4 kg] and mean +/- standard deviation (SD) age of 7.3 +/- 2.6 y were included in the study. Fifty-four percent of dogs were female (52 spayed and 2 unaltered), and 46% were male (40 neutered and 6 unaltered). Elective procedures included cranial cruciate ligament repair (83%), total hip replacement (8%), medial patellar luxation repair (5%), femoral head ostectomy (3%), and a partial tarsal arthrodesis (1%). A variety of breeds were represented.

The overall agreement amongst anesthesiologists on changing the anesthesia-related case management was slight (κ = 0.15, 95% CI: 0.09 to 0.21, P < 0.001). The agreement amongst anesthesiologists on modifying the patient’s management (κ = 0.29, 95% CI: 0.23 to 0.35, P < 0.001) and fluid therapy (κ = 0.23, 95% CI: 0.17 to 0.29, P < 0.001) was fair and the agreement was poor for whether or not to postpone or cancel surgery (κ = 0.11, 95% CI: 0.05 to 0.17, P < 0.001), repeat laboratory tests later (κ = 0.17, 95% CI: 0.11 to 0.24, P < 0.001), change monitoring (κ = 0.03, 95% CI: -0.03 to 0.09, P = 0.333), do further testing (κ = 0.06, 95% CI: 0.00 to 0.12, P = 0.046), change ASA status (κ = 0.1, 95% CI: 0.03 to 0.16, P = 0.002), change client communication (κ = 0.08, 95% CI: 0.02 to 0.14, P = 0.010), and avoid NSAIDs (κ = 0.10, 95% CI: 0.03 to 0.16, P = 0.002).

One or more anesthesiologist(s) decided to cancel or postpone surgery in 6% of cases, change fluid therapy in 38% of cases, repeat laboratory testing in 32% of cases, change monitor-

Table 4. Total number of anesthesia-related changes made in each category by individual anesthesiologists.

<table>
<thead>
<tr>
<th>Category</th>
<th>EH</th>
<th>SK</th>
<th>MB</th>
<th>MS</th>
<th>JQ</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Further surgery</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Postpone/cancel</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Fluid therapy change</td>
<td>16</td>
<td>4</td>
<td>18</td>
<td>24</td>
<td>4</td>
<td>66</td>
</tr>
<tr>
<td>Repeat laboratory test later</td>
<td>5</td>
<td>2</td>
<td>13</td>
<td>15</td>
<td>14</td>
<td>49</td>
</tr>
<tr>
<td>Change monitoring</td>
<td>4</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Change management</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>5</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Do further testing</td>
<td>7</td>
<td>0</td>
<td>23</td>
<td>5</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Change ASA status from 1/2</td>
<td>9</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Change client communication,</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>5</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>i.e., risk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoid NSAIDS</td>
<td>46</td>
<td>0</td>
<td>3</td>
<td>35</td>
<td>27</td>
<td>111</td>
</tr>
</tbody>
</table>

ing in 9% of cases, change management in 10% of cases, do further testing in 28% of cases, change ASA status in 13% of cases, change client communication in 11% of cases, and avoid NSAIDs in 63% of cases due to abnormal pre-anesthetic screening test results. Sixty-four percent of changes (134/210) were made by a single (1/5) anesthesiologist and 21% of cases had no changes made by any of the anesthesiologists (Table 2).

Only 13% of dogs had all values within the UGA VMC reference range. The most common abnormalities are summarized in Table 3. None of the animals had potassium values > 5.7 mmol/L. Eleven percent of dogs had alkaline phosphate values > 190 U/L and 5% of dogs had values > 300 U/L. None of the animals had blood glucose levels > 8.7 mmol/L, platelet counts < 140 x 10^3/μL, albumin > 49 g/L or magnesium values > 1.2 mmol/L.

All 5 anesthesiologists agreed to alter case management in 3% of patients. Of these cases, abnormal test results indicated renal dysfunction in 1 dog, dehydration in another, and a high nucleated red blood cell count, moderate eosinophilia, and mild increase in serum creatinine with a urine specific gravity of 1.008 in the third dog. For the patient with renal dysfunction, all 5 anesthesiologists changed fluid therapy and 4 out of 5 anesthesiologists changed management, monitoring, and avoided NSAIDs. For the dehydrated patient, 4/5 anesthesiologists changed fluid therapy and one avoided NSAIDs and for the third patient, 4 out of 5 anesthesiologists avoided NSAIDs and decided to repeat laboratory tests later. The remaining anesthesiologist decided to change patient management by adding diagnostic techniques that commonly accompany urinalysis abnormalities suggestive of urinary tract infections. Overall, the avoidance of NSAIDs was the most affected decision due to abnormal test results; however, there was only slight agreement amongst anesthesiologists and one anesthesiologist did not avoid NSAIDs in any of the cases (Table 4).

Discussion

The objective of this study was to determine if anesthesiologists changed peri-anesthetic plans based on routine pre-anesthetic laboratory screening in healthy dogs anesthetized for elective procedures. Peri-operative anesthetic management was altered in 79% of patients based on pre-anesthetic screening results; however, there was only slight agreement amongst the 5 anesthesiologists. Unfortunately, there is no gold standard for the appropriate course of action based on abnormal test results and...
all 5 anesthesiologists agreed to alter case management in only 3% of patients (Table 2). Individual anesthesiologists altered case management in as few as 7% of cases and as many as 55% of cases. Previous studies reported alteration of anesthetic management in 3% (12) and 0.9% (9) of healthy dogs due to abnormal pre-anesthetic laboratory test results. Abnormal CBC results did not lead to alteration of anesthetic management in healthy horses (13). These studies, however, did not take into account as many specific anesthesia-related decisions as the present study.

Interestingly, most of the anesthesia-related case decisions made in our study had only slight agreement amongst anesthesiologists with a Fleiss’ kappa value between 0.01 and 0.2, which suggests major discrepancies can occur among ACVAA diplomates. This has also been reported amongst anesthesiologists for the assignment of ASA physical status to small animal cases leading to over- or under-estimation of the anesthetic risk of the patient (28). Possible explanations for the discrepancies amongst anesthesiologists found in our study include the large amount of personal interpretation and subjectivity required for these decisions, how risk-average each anesthesiologist is, previous personal experience, which may influence how aggressively abnormal test results are addressed, and differences in personal opinion where clear evidence-based guidelines do not exist; for example, deciding whether or not to avoid NSAIDs. The data sheets of NSAIDs warn that impaired kidney function is a contraindication to NSAID therapy. However, one study showed less progression of stable chronic kidney disease (CKD) in cats receiving meloxicam once daily for over 6 mo compared to cats with a similar stage of CKD not receiving meloxicam (29).

Another similar study supports the routine use of ketoprofen in humans with mild chronic renal insufficiency (30).

Based on the results of this study, pre-anesthetic laboratory screening may be of benefit in healthy dogs since it did influence anesthesia-related decisions to varying extents for each anesthesiologist. The majority of anesthesiologists (3/5) made one or more change(s) to case management in 32% of cases, which we consider to be significant. Poor agreement amongst anesthesiologists, however, could suggest that many of these changes may not have been necessary. One or more anesthesiologist(s) decided that no change in anesthesia-related case management was necessary in 97% of dogs. Interestingly, there were 3 cases in which 1 out of the 5 anesthesiologists decided to postpone/cancel the procedure due to abnormal test results, while 2 anesthesiologists in 2 cases and 3 anesthesiologists in the other case did not make any change at all based on the same pre-anesthetic test results. The influence of these decisions on patient outcome is unknown and it was not the goal of the current study. Our objective was to determine if abnormal pre-anesthetic laboratory screening affected the anesthesiologist’s decision. A direction of future studies could be to correlate these specific anesthesia-related decisions to patient outcome.

A good history and thorough physical examination are heavily relied upon in humans when determining whether or not pre-anesthetic screening tests are necessary. When comparing the preoperative assessment of human patients versus veterinary patients, it is important to keep in mind several differences. Veterinarians work with either an unknown or second-hand history from the owner who may or may not pay close attention to their pet. A thorough physical examination is only possible in co-operative patients and interpretation of results can be difficult in nervous patients. Breed-related differences in aging and risks further complicate matters. Finally, veterinary anesthesiologists do not often have the opportunity to take their own anesthesia-related history from the client, unlike human anesthesiologists. Due to these differences, a good history and physical examination may not be as thorough in veterinary patients compared with human patients, and pre-anesthetic screening of low-risk veterinary patients may be of greater value.

To the authors’ knowledge, the only hematologic parameter that has been specifically linked to an increased risk of anesthetic-related death in dogs is a hematocrit value outside the reference range (37% to 55%), increasing the risk by 5.5-fold (26). More abnormal test results were found in our study compared to similar human studies. A similar veterinary study also reported several blood abnormalities in healthy dogs. Most deviated only slightly from reference values; however, 8% of patients were allocated a higher ASA category, 0.9% would have had pre-anesthetic therapy initiated, and 0.8% would have had their surgery postponed based on the results (9). A veterinary study looking at pre-anesthetic screening in both cats and dogs found that blood analysis indicated an unsuspected problem in only 0.9% of patients, 4 of which had elevated alkaline phosphatase and 2 patients had high urea (10). Finally, a study looking at the value of pre-anesthetic CBC in healthy horses found abnormal values in 54% of the subjects, 8% of which were considered to be important, although none of them developed surgical complications or had their anesthetic management altered (13).

Our study population consisted of a broad age range of dogs between 2 to 12.5 y old. There is some evidence in the veterinary literature that pre-anesthetic screening in geriatric patients may be valuable (11,31). One study looked at the benefits of pre-anesthetic screening in 101 geriatric dogs presenting for elective procedures. They reported 30 new diagnoses made based on pre-anesthetic screening laboratory test results. Thirteen of these dogs had their surgery cancelled and 6 had further diagnostic tests performed. No specific anesthetic management changes were reported (11). Of the 32% of cases in which the majority of anesthesiologists made 1 or more change(s) to case management, 75% (24/32) of the dogs were > 6 y of age. It is possible that if we had selected for healthy patients less than 7 y old, fewer abnormal test results may have been found.

Various breeds with different associated risk factors are represented in our study. In humans, pre-anesthetic laboratory testing and imaging are used to screen patients at risk for disease (16). This concept has also been explored in veterinary medicine by assessing the value of laboratory screening in 53 clinically normal golden retriever dogs > 6 y old (31). Abnormalities indicative of potentially significant disease were revealed by laboratory tests (CBC, biochemistry, UA) in 54.7% of dogs and by abdominal ultrasound in 64.2% of dogs. Occult splenic masses were found in 53% of patients suggesting that routine ultrasonography of this breed and age group may be beneficial. This study supported the implementation of routine testing in
older patients but the sample size was too small to make concrete recommendations.

On the human side, the UK National Institute for Health and Care Excellence (NICE) has published guidelines regarding routine pre-anesthetic tests for routine surgeries. These guidelines take into account both the age of the patient and the grade of surgery being performed. Complete blood cell count is considered for all ASA III and IV classifications undergoing surgery graded intermediate and recommended for all classifications undergoing surgery graded major/complex. Biochemical testing is recommended for ASA II to IV and considered for ASA I patients undergoing surgery graded major/complex. Interestingly, an ovariohysterectomy is considered to be a major/complex surgery requiring a CBC due to the potential for blood loss and lengthy surgical times especially in a teaching hospital (18). Perhaps the grade of surgery being performed should also be considered along with age and ASA grade when deciding the necessity of pre-anesthetic screening in veterinary patients.

Due to the retrospective nature of our study, a major limitation is the reliance on medical records, which may give a different impression than direct observation and interaction with each patient. Other limitations include the small sample size \( n = 100 \) compared to similar studies, wide age range and inability to correlate case management decisions with patient outcome as the decisions made were hypothetical. We believe our sample size is reasonable for a preliminary study. Future studies should include more cases and consider geriatric patients separately. The number of changes made to anesthesia-related case management depends on the usual techniques used and their alternatives. Our study only considered changes from the standard of care at the UGA VMC and the opinions of boarded anesthesiologists. Perhaps if the same study were repeated at an institution with a different standard of care, the results would be different. Finally, our study did not take into account drug protocol in any of the case management decisions. Various premedication protocols are used at the University of Georgia, and drug choice is based on both the needs of the individual patient and the anesthesiologist’s preference. Although interesting, it would have been difficult to assess the effect of pre-anesthetic screening tests on drug protocol choice due to differences in experience and comfort level amongst anesthesiologists with a greater variety of drug protocol choices.

A previous study reported a change in drug protocol for only 0.2% of dogs based on pre-anesthetic blood analysis; however, the usual anesthetic protocol at this clinic consisted of a benzodiazepine and an opioid (9). This drug combination could also be considered safe for dogs with a higher ASA physical status. Since 8% of dogs in the same study were assigned a higher ASA grade based on pre-anesthetic blood analysis, it would be interesting to know if a higher percentage of drug protocol change would have occurred at this clinic if a greater variety of premedication drugs were routinely used.

In conclusion, pre-anesthetic laboratory screening in healthy dogs anesthetized for elective procedures may influence peri-anesthesia-related decisions, but this change can be very subjective and the effect on patient outcome is unknown. The aim of pre-anesthetic screening is to reduce risk and increase quality of care by identifying pre-existing medical conditions and potential anesthetic difficulties. Further studies are required to determine if decisions made based on pre-anesthetic laboratory screening tests result in improved patient outcome. Test results should be interpreted carefully and viewed as part of an overall assessment of the patient.

References
23. Brodbelt DC, Pfeifer DU, Young LE, Wood JL. Risk factors for anaesthetic-related death in cats: Results from the confidential enquiry
Scratching is a normal, natural feline behaviour and an important form of communication between cats. Unfortunately, cat scratching isn’t always directed at the scratching post. Up to 70% of cat owners have experienced cat scratching on furniture, carpets and other undesirable locations, making it the number one unwanted feline behaviour in cat-owning households (1).

Newly launched FELISCRATCH by FELIWAY®, from Ceva Animal Health Inc., is proven to help stop or prevent unwanted scratching in the home by redirecting cat scratching onto the scratching post (2).

“Declawing cats to prevent scratching on furniture used to be a common practice in Canada” notes Dr. Mike Bondar, Technical Services Veterinarian at Ceva. “Whereas the Canadian Veterinary Medical Association now opposes the elective declawing of cats, and the provincial veterinary associations in Nova Scotia and British Columbia have banned cat declawing in their provinces.”

“Many pet owners don’t realize that declawing cats can cause unnecessary and avoidable pain” Dr. Bondar adds. “As veterinary professionals, we need to do a better job of informing cat owners about the alternatives available to manage unwanted scratching behaviour in the home.”

Like Ceva’s other cat pheromone products, FELIWAY® CLASSIC and FELIWAY® FRIENDS, innovative new FELISCRATCH by FELIWAY helps manage unwanted feline behaviours using cats’ natural messages. FELISCRATCH by FELIWAY is a synthetic copy of the feline interdigital semiochemical (FIS) pheromone that cats naturally produce when they scratch.

FELISCRATCH by FELIWAY works for both cats already scratching and for newly adopted cats or kittens.

When applied on the scratching post, FELISCRATCH by FELIWAY attracts cats to scratch in three ways:
1. Blue coloured lines mimic the visual message of scratch marks
2. Catnip helps attracts cats to the scratching post
3. Pheromone message directs cat scratching on the surface where the product is applied

FELISCRATCH by FELIWAY works for both cats already scratching and for newly adopted cats or kittens.

For cats that have been destructively scratching for a long time, it’s recommended to use both FELISCRATCH by FELIWAY and FELIWAY CLASSIC Spray. Apply FELISCRATCH by FELIWAY on the scratching post and apply FELIWAY CLASSIC Spray on each unwanted scratching location.

“With the launch of FELISCRATCH by FELIWAY, veterinary professionals finally have a clinically proven, effective solution for managing unwanted scratching that respects the cat’s natural behaviour while also resolving the pet owner’s frustration” remarks Dr. Bondar. “It’s a win-win situation.”

Each package of FELISCRATCH by FELIWAY contains 9 pipettes: one full series of applications for one scratching post.

References
1. FELIWAY Brand Equity Study, Burke, 2014.

Contact: CEVA Animal Health Inc., 6–1040 Fountain Street North, Cambridge, ON N3E 1A3; phone: 1-800-510-8864; website: www.ceva-canada.ca or www.feliway.ca
A retrospective analysis of feedlot morbidity and mortality outcomes in calves born to dams with known viral vaccination history

Tye Perrett, Deborah L. Johnson, Jiming Song, Shari van de Pol, Devin A. Dahlman, Ryan D. Rademacher, Sherry J. Hannon, Calvin W. Booker

Abstract — This retrospective analysis aimed to determine the effects of a maternal viral vaccination program (MVVP; Express Verified) on calf health during the feeding period. In low- and high-risk populations, calves born to dams vaccinated pre-breeding with program products had improved morbidity and mortality outcomes compared with non-program animals.

Résumé — Analyse rétrospective de la morbidité dans des parcs d’engraissement et résultats de mortalité chez les veaux nés de mères ayant des antécédents de vaccination connus. Cette analyse rétrospective visait à déterminer les effets d’un programme maternel de vaccination virale (PMVV; Express Verified) sur la santé des veaux durant la période d’allaitement. Dans les populations à risque faible et élevé, les veaux nés de mères vaccinées avant l’accouplement avec des produits de programme présentaient des résultats améliorés de morbidité et de mortalité comparativement aux animaux à l’extérieur du programme.

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Introduction

The Express Verified (Boehringer Ingelheim, Burlington, Ontario) maternal viral vaccination program (MVVP) is a unique program in which calves born to dams vaccinated pre-breeding with any Express FP products qualify for the Express Guarantee program (1). A calf’s eligibility to be categorized as MVVP was based on vaccination status of the calf’s dam, not the calf itself. Previous work has demonstrated that pre-breeding vaccination with a pentavalent modified live viral vaccine was effective at preventing bovine viral diarrhea virus (BVDV) persistent infection (PI) in calves when dams were exposed to BVDV-PI animals during pregnancy (2). In addition, calves born to vaccinated dams had higher birth and subsequent weaning weights compared with calves born to non-vaccinated dams. The authors hypothesized that this MVVP may have positive impacts on the overall health of post-weaned calves. Although there have been previous studies on the value of various preconditioning and calf vaccination programs (3–6), to the authors’ knowledge, this is the first report to investigate the effects of a maternal viral vaccination program on subsequent calf health outcomes during the feeding period. The objective of this retrospective analysis was to compare morbidity attributable to bovine respiratory disease (BRD), overall mortality, and BRD mortality in MPPV animals to non-MVVP animals that entered commercial feedlots in western Canada from 2008 to 2012 (inclusive).

Materials and methods

Individual animals identified as part of the maternal viral vaccination program (MVVP; n = 9315) were compared to non-MVVP penmates (PEN; n = 463 847) and non-MVVP non-penmates (NON-PEN; n = 938 636). To qualify as part of the MVVP, animals must have been born to dams vaccinated pre-breeding with a program vaccine containing at least the following modified live viruses: BVDV types 1 and 2, infectious bovine rhinotracheitis (IBR), bovine respiratory syncytial virus (BRSV), and parainfluenza 3 (PI3) (1). Animals classified as PEN had unknown vaccination history and arrived into an MVVP animal’s pen within 2 d (inclusive) of the MVVP animal’s arrival date with the same gender, age class, and health risk category. Animals classified as NON-PEN met the same criteria as PEN animals with the exception that these animals arrived into pens that did not contain MVVP animals. Pens with < 100 head of cattle were omitted from the analysis. Using the predictive risk of developing undifferentiated fever (UF)/BRD assigned at feedlot arrival, animals were grouped into low risk (LR), medium risk (MR), and high risk (HR) health categories. Criteria used by feedlots to assign health risk categories included, but were not limited to: arrival weight, age class, procurement method, source, degree of pre- and post-arrival commingling, placement season, pre-feedlot management, and gender. Health risk category, age class, and gender were used in data exploration.

Animal health outcomes included BRD morbidity, overall mortality, and BRD mortality rates. Bovine respiratory disease
morbidity was based on treatment rates of “sick” animals with UF and no fever (NF). The case definitions for UF and NF were animals exhibiting signs of respiratory illness (identified by animal health personnel at each feedlot based on subjective criteria such as general appearance, attitude, gauntness, reluctance to move, as well as localized clinical signs such as ocular/nasal discharge, cough, and abnormal respiration) with a rectal temperature at initial diagnosis $\geq 40.5^\circ C$ and $< 40.5^\circ C$, respectively. A postmortem examination was performed on all animals that died. The definitions and calculations for animal health outcomes are presented in Table 1.

Data were analyzed using the GENMOD procedure (SAS software, Windows version 9.3; SAS Institute, Cary, North Carolina, USA); Poisson regression in a log-linear model for experimental group effects and adjusted for clustering of observations (arrival date range and pen nested within feedlot) with generalized estimating equations.

### Results

In total, 1,411,798 animals from 49 feedlots, representing 10,927 groups of feeder cattle, were included in this analysis. The distribution of animals by MVVP classification and BRD risk category is presented in Table 2 and the morbidity and mortality outcomes are summarized in Table 3; age and gender were collapsed due to the relatively low proportion of MVVP animals. In pens containing MVVP animals, the average proportion of MVVP animals/pen was 1.74% (median: 0.75%, range: 0.04% to 38.34%). In LR animals, the UF rate was significantly lower in MVVP animals compared to NON-PEN in LR animals. No significant differences in UF, NF, combined UF/NF, overall mortality, and BRD mortality rates were collapsed due to the relatively low proportion of MVVP animals. The UF — undifferentiated fever; NF — no fever; BRD — bovine respiratory disease.

### Discussion

In the LR and HR populations, MVVP animals had improved morbidity and mortality outcomes compared with non-MVVP animals (PEN and NON-PEN). Due to the retrospective nature of this analysis, it is impossible to determine if this improvement was related directly to the maternal vaccination program or unknown factor(s). Maternal vaccination programs are generally aimed at protecting the dam and preventing abortions. Through ingestion of colostrum, calves acquire passive immunity from maternal antibodies, and enhanced immune response from maternal cytokines and leukocytes (7). Evidence exists suggesting maternal vaccination may serve to enhance calf cell-mediated immunity through passive transfer of responsive maternal leukocytes (8), and calves receiving maternal leukocytes may have more rapid development of antigen presenting cells (7,9).

Maternal humoral immunity has usually waned by the time calves reach the feedlot at generally $> 200$ d of age. Previous researchers have estimated that the mean time to seronegative status from branding (approximately 60 d after birth) based on antibody half-life for BVDV (Types 1a, 1b, and 2), bovine herpes virus (BHV, Type 1), PI3, and BRSV ranged from 122.9 to 192.2 d (10). The LR population in the present study would have entered the feedlot at an older age on average; therefore, it is unlikely that maternal antibodies had any appreciable direct impact in this population as maternal antibodies would be minimal or no longer present at the time of feedlot arrival. However, maternal antibodies may have had some positive effect in the HR population which usually enters the feedlot at a younger age than the LR population.

In Fulton et al (10), the estimated time to seronegative status was extended for all viruses except BRSV by calf-hood vaccination at approximately 60 d of age (branding) and again 95 d later with a pentavalent inactive viral vaccine. Calf-hood vaccination status of animals was not available, and the authors cannot speculate as to how this may or may not have affected the improved health outcomes observed. A more likely explanation may be improved pre-weaning health in calves derived from maternal vaccination, which is then carried over to improved animal health during the feeding period for MVVP calves. Previous researchers demonstrated that

### Table 1. Definitions and calculations from a retrospective analysis of a maternal viral vaccination program in cattle.

<table>
<thead>
<tr>
<th>Animal health rates</th>
<th>Initial UF treatment</th>
<th>Number of animals initially treated for UF divided by the total number of animals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial NF treatment</td>
<td>Number of animals initially treated for NF divided by the total number of animals</td>
</tr>
<tr>
<td></td>
<td>Combined initial UF/NF treatment</td>
<td>Number of animals initially treated for either UF or NF divided by the total number of animals</td>
</tr>
<tr>
<td></td>
<td>Overall mortality</td>
<td>Number of deaths (all causes) divided by the number of animals</td>
</tr>
<tr>
<td></td>
<td>BRD mortality</td>
<td>Number of deaths due to BRD divided by the number of animals</td>
</tr>
</tbody>
</table>

UF — undifferentiated fever; NF — no fever; BRD — bovine respiratory disease.

### Table 2. Distribution of animals by study classification and bovine respiratory disease risk category from a retrospective analysis of a maternal viral vaccination program in cattle.

<table>
<thead>
<tr>
<th>Risk category</th>
<th>MVVP</th>
<th>PEN</th>
<th>NON-PEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk</td>
<td>3053</td>
<td>161</td>
<td>334</td>
</tr>
<tr>
<td>Median risk</td>
<td>2396</td>
<td>152</td>
<td>161</td>
</tr>
<tr>
<td>High risk</td>
<td>3866</td>
<td>150</td>
<td>352</td>
</tr>
</tbody>
</table>

Animals classified as receiving products related to a specific maternal viral vaccination program (MVVP; Express Verified) were identified for inclusion in the study using their Canadian Cattle Identification Agency tag. Animals classified as PEN had unknown history and arrived into an MVVP animal’s pen within 24 d (inclusive) of the MVVP animal’s arrival date. Animals classified as NON-PEN met the same criteria as PEN animals with the exception that these animals arrived into pens that did not contain MVVP animals at the same feedlot.
dairy heifers with extensive lung consolidation (determined by thoracic ultrasonography at 3 mo of age) had greater risk of dying or being culled before first calving (11). Similarly, Stanton et al (12) observed decreased survival to first calving in dairy heifers treated for BRD in the first 60 d after movement to group housing (at approximately 8 wk of age). In addition, heifers treated for BRD during this time period had decreased growth, increased age at first calving, and decreased calving ease. Although direct comparison cannot be made between dairy heifers and beef calves, it is reasonable to hypothesize that pre-weaning disease in beef calves may have lasting effects on animal health during the finishing phase.

Another possible explanation for the improved health outcomes observed in MVVP animals could be higher weaning weights. Weight on arrival at the feedlot is a significant pre-feeding variable with animals having lower arrival weight experiencing higher morbidity and mortality associated with BRD. Givens et al (2) demonstrated that calves born to vaccinated dams had higher weaning weights than calves born to non-vaccinated dams. It is important to note that dams in that study were exposed to BVD-PI animals and also to animals shedding BHV during pregnancy, and that 4 of 10 unvaccinated dams aborted. Additionally, all calves and fetuses in the unvaccinated group were positive for BVDV compared to none in the vaccinated group. Therefore, the conditions in that challenge study likely do not represent conditions in commercial production in the absence of a high BVDV and BHV challenge during pregnancy.

It is also possible that the improved animal health outcomes observed in MVVP animals may relate to factors outside the maternal vaccination program itself. The fact that certain producers vaccinated the dams and enrolled the calves in the MVVP program may indicate that these producers also employed other management practices that would improve post-weaning health. Due to the retrospective nature of this study, information on previous management practices was not available. Additionally, data regarding calf-hood management practices in western Canada are limited. A producer survey conducted in 2010 showed considerable variation in management practices, such as maternal vaccination, among producers. Moreover, larger herd size was associated with a greater use of calf-hood management practices (13). Therefore, it is reasonable to presume that producers who employ a maternal vaccination program may also employ additional management practices that improve the overall health of the calf, which may have positive impacts on morbidity and mortality in the feedlot.

In the MR population, no differences in morbidity or mortality outcomes were observed between MVVP and non-MVVP animals. The reason for the lack of differences in the MR animals is unknown, but may relate to higher variability in

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**Table 3. Animal health data summary from a retrospective analysis of a maternal viral vaccination program in cattle.**

<table>
<thead>
<tr>
<th>Animal health variable</th>
<th>MVVP</th>
<th>PEN (RR; 95% CI)*</th>
<th>NON-PEN (RR; 95% CI)*</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Morbidity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial UF treatment (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low risk</td>
<td>0.23a</td>
<td>0.57b (2.50; 1.07 to 5.87)</td>
<td>0.94b (4.10; 1.75 to 9.61)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Medium risk</td>
<td>2.34</td>
<td>0.98</td>
<td>0.97</td>
<td>0.741</td>
</tr>
<tr>
<td>High risk</td>
<td>2.61ab</td>
<td>4.85b (1.86; 1.46 to 2.36)</td>
<td>4.68b (1.79; 1.40 to 2.29)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Overall</td>
<td>1.76</td>
<td>2.09</td>
<td>2.25</td>
<td>0.282</td>
</tr>
<tr>
<td>Initial NF treatment (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low risk</td>
<td>0.56ab</td>
<td>0.55a</td>
<td>0.68b</td>
<td>0.024</td>
</tr>
<tr>
<td>Medium risk</td>
<td>0.96</td>
<td>0.82</td>
<td>0.82</td>
<td>0.904</td>
</tr>
<tr>
<td>High risk</td>
<td>2.12</td>
<td>2.43</td>
<td>2.56</td>
<td>0.263</td>
</tr>
<tr>
<td>Overall</td>
<td>1.31ab</td>
<td>1.25a</td>
<td>1.38b</td>
<td>0.039</td>
</tr>
<tr>
<td>Combined initial UF/NF treatment (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low risk</td>
<td>0.79a</td>
<td>1.12a</td>
<td>1.62b (2.06; 1.34 to 3.17)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Medium risk</td>
<td>3.30</td>
<td>1.80</td>
<td>1.79</td>
<td>0.767</td>
</tr>
<tr>
<td>High risk</td>
<td>4.73a</td>
<td>7.28b (1.54; 1.23 to 1.92)</td>
<td>7.24b (1.53; 1.22 to 1.91)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Overall</td>
<td>3.07</td>
<td>3.34</td>
<td>3.64</td>
<td>0.137</td>
</tr>
<tr>
<td><strong>Mortality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall mortality (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low risk</td>
<td>1.05ab</td>
<td>1.09a</td>
<td>1.32b</td>
<td>0.002</td>
</tr>
<tr>
<td>Medium risk</td>
<td>1.59</td>
<td>1.39</td>
<td>1.37</td>
<td>0.788</td>
</tr>
<tr>
<td>High risk</td>
<td>1.78ab</td>
<td>2.55b (1.43; 1.08 to 1.88)</td>
<td>2.63b (1.47; 1.11 to 1.95)</td>
<td>0.009</td>
</tr>
<tr>
<td>Overall</td>
<td>1.49ab</td>
<td>1.63b</td>
<td>1.79b</td>
<td>0.002</td>
</tr>
<tr>
<td>BRD mortality (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low risk</td>
<td>0.10a</td>
<td>0.17a</td>
<td>0.36b (3.71; 1.15 to 11.95)</td>
<td>0.001</td>
</tr>
<tr>
<td>Medium risk</td>
<td>0.33</td>
<td>0.22</td>
<td>0.22</td>
<td>0.762</td>
</tr>
<tr>
<td>High risk</td>
<td>0.10a</td>
<td>0.66b (6.40; 2.39 to 17.13)</td>
<td>0.72b (6.95; 2.60 to 18.57)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Overall</td>
<td>0.16a</td>
<td>0.35b (2.16; 1.19 to 3.91)</td>
<td>0.43b (2.69; 1.48 to 4.87)</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

* Values lacking a common superscript are significantly different (P < 0.050).
* Data were analyzed using the GENMOD procedure (SAS software, Windows version 9.3; SAS Institute, Cary, North Carolina); Poisson regression in a log-linear model for experimental group effects and adjusted for clustering of observations (arrival date range and pen nested within feedlot) with generalized estimating equations.
* For values that differed significantly compared to the MVVP group, the relative risk (RR) and 95% confidence interval (95% CI) are presented.
individual-animal UF/BRD risk in this group. In commercial feedlots, UF/BRD risk is assigned and managed for cohorts of animals; however, individual-animal UF/BRD risk exists on a continuous spectrum. Given that the MR category falls between both the LR and HR categories, the individual animal UF/BRD risk within this population may inherently be more variable, and this variability may have negated any expected positive outcomes.

With respect to non-MVVP animals, PEN animals had favorable health outcomes compared with NON-PEN animals in LR populations. It is not known whether the presence of MVVP animals in a pen had a positive influence on the health outcomes of non-MVVP pen mates in this LR population. However, given the relatively low proportion of MVVP animals within pens containing MVVP animals (mean: 1.74%, median: 0.75%, range: 0.04% to 38.34%), it is unlikely that MVVP animals exerted any strong influence on the health of their non-MVVP pen mates. One possible explanation could be that when animals are purchased to fill a pen, animals purchased at the same time as MVVP animals could all be of a slightly lower inherent UF/BRD risk within the overall LR population. No differences were observed between PEN and NON-PEN in the MR and HR populations.

As with most retrospective observational studies, careful interpretation of these results is required to avoid over-extrapolation without additional supporting data. However, the authors acknowledge the challenges associated with conducting a large-scale randomized field trial to investigate the effects of dam vaccination programs on calf health during the feeding period. This is the first report to demonstrate an association between vaccination programs on calf health during the feeding period.

Acknowledgment

Funding for this project was provided by Boehringer Ingelheim (Canada), Burlington, Ontario. A list of Express Verified animals was provided by Boehringer Ingelheim as identified by their Canadian Cattle Identification Agency tag.

References

A longitudinal study describing horse demographics and movements during a competition season in Ontario, Canada

Kelsey L. Spence, Terri L. O’Sullivan, Zvonimir Poljak, Amy L. Greer

Abstract – The objective of this study was to describe the demographics and movement patterns of a sample of horses in Ontario, Canada. A convenience sample of 222 owners completed an initial questionnaire to provide demographic information for 570 horses. These horses were enrolled in a longitudinal study to document their movements from May to November 2015 using a monthly questionnaire. The median age of the participating horses was 11 years (IQR: 8 to 16 years). The primary discipline of participating horses included competitive disciplines (63.3%), leisure (33.3%), and racing (3.2%). During the 7-month period, there were 3001 unidirectional movements of horses between facilities. Reasons for travel on/off a facility included attending a competition (38.7%), leisure activities (18.8%), and training (7.5%). The demographic and movement data presented in this study provide insight into the characteristics of a subset of horses in Ontario, and may contribute to outbreak preparedness in the population.

Résumé – Étude longitudinale décrivant les données démographiques des chevaux et leurs mouvements durant une saison compétitive en Ontario, au Canada. L’objectif de cette étude consistait à décrire les données démographiques et les mouvements d’un échantillon de chevaux en Ontario, au Canada. Un échantillon utile était composé de 222 propriétaires qui ont rempli un premier questionnaire afin de fournir des données démographiques pour 570 chevaux. Ces chevaux étaient inscrits dans une étude longitudinale afin de documenter leurs mouvements de mai à novembre 2015 à l’aide d’un questionnaire mensuel. L’âge médian des chevaux participants était de 11 ans (IQR : 8 à 16 ans). La discipline primaire des chevaux participants comprenait des disciplines de compétition (63,3 %), d’agrément (33,3 %) et de course (3,2 %). Durant la période de 7 mois, il y a eu 3001 déplacements unidirectionnels de chevaux entre les installations. Les raisons des déplacements à l’aller ou au départ d’une installation incluaient une compétition (38,7 %), des activités d’agrément (18,8 %) et l’entraînement (7,5 %). Les données sur la démographie et les mouvements dans cette étude ont fourni des renseignements sur les caractéristiques d’un sous-groupe de chevaux en Ontario et pourront contribuer à la préparation aux éclusions au sein de la population.

Introduction

The effective prevention and control of equine disease outbreaks depend on accurate knowledge of the equine population at risk. Descriptions of baseline horse characteristics, such as vaccination histories, horse movement patterns, and the use of biosecurity measures by horse owners can lend support when planning disease prevention, surveillance, and control strategies (1,2). Populations of horses are highly diverse, ranging from horses that compete in sporting/competition events to those that are kept as companion animals. When horses visit locations outside of their home facility, there is a risk of exposure to infectious agents and possibly subsequent spread of infection (3–6). An understanding of horse demographics, and the extent of horse movements among facilities, would enable more thorough investigations into the potential for disease spread in the population.

Horse demographics and movement patterns have been previously described in numerous countries (7–11), sometimes based on existing data (2,12,13). When existing data are not available, interview and questionnaire-based methods have been used as alternative strategies to describe horse populations in Japan (14), Great Britain (9), New Zealand (8), and South Africa (15). Examples of major equine disease outbreaks in other countries, including equine influenza in Australia in 2007 (16) and equine herpes virus infections in the USA in 2011 (4), highlight the need to further describe the Canadian equine population to aid...
in the development of disease preparedness strategies before a major outbreak occurs.

There is limited information available describing the characteristics of the horse population in Ontario. Every 5 y, the Census of Agriculture, conducted by the Canadian government, provides updates on the number of horses and their geographical distribution throughout the country (17). The 2016 Census of Agriculture estimated that there were 64,536 horses residing on 9,294 farms in Ontario (17). While this information provides a general overview of horses in Ontario, the demographics and movement patterns of the Ontario horse population have not been described in the literature. Having access to comprehensive information on horses and horse facilities in Ontario is important to inform evidence-based decisions on the utility of disease prevention and control strategies.

The objectives of this study were to i) describe the characteristics of a sample of horses and horse facilities in Ontario, Canada; and ii) describe the movements of these horses over a 7-month period (May to November 2015). This time period was chosen to capture horse movements during the summer and fall seasons, as we assumed that most equestrian activities would occur during this time given the continental climate in Ontario.

Materials and methods

Study design

This was a descriptive study consisting of 2 phases: an initial cross-sectional questionnaire (“Enrollment questionnaire,” March to June 2015), and a longitudinal study (“Monthly questionnaire,” May to November 2015). The cross-sectional questionnaire was used to describe the characteristics of the sample of horses and to enroll horse owners into the longitudinal study. The longitudinal study was used to collect information on horse movements from the participating owners on a monthly basis. This study was reviewed and approved by the University of Guelph Research Ethics Board (REB#15FE013).

Recruitment

Participant recruitment occurred between March 13th and June 8th, 2015. Due to the absence of an available registry of horses, owners, or facilities in Ontario, a sampling frame could not be established for recruitment and/or sample size calculation. A variety of electronic, print, and in-person methods were used for recruitment, including social media advertisements and distribution through the mailing lists of relevant equestrian organizations and industry groups. Individuals were eligible to participate in the study if they were 18 y of age or older, resided in Ontario, and were the person responsible for at least 1 horse. Individuals were invited to participate in the study regardless of the use of their horse and the owner's estimate of the frequency of travel (i.e., a participant was not required to travel with their horse to join the study). Individuals were required to have either an e-mail address or a telephone number to participate. Upon enrollment, participants were entered into a draw to win 1 of 3 gift cards from an equine equipment store, and received additional entries for each monthly response during the longitudinal study.

Questionnaire design and data collection

The initial enrollment questionnaire was a modified electronic version of a questionnaire previously tested in a pilot study by Spence et al (18). The questionnaire was administered using the survey software Qualtrics (Qualtrics, Provo, Utah, USA) and was beta-tested by a group of 7 individuals, including researchers, veterinarians, and horse owners. The enrollment questionnaire consisted of 14 questions regarding descriptions of the participant’s horse(s) and the facility where their horse was boarded (referred to as the horse’s “home facility”). Participants could enroll up to 10 horses if they were the person responsible for all of the enrolled horses. Descriptive horse characteristics that were collected using the questionnaire included: age (open-ended), gender (closed-ended), primary sport/competition discipline (closed-ended, further categorized into racing, leisure, or competitive disciplines for statistical testing), and vaccines administered in the past 12 mo (closed-ended). Descriptive characteristics of home facilities included: the first 3 digits of the postal code (open-ended), the number of other owners who also boarded horses at the facility (closed-ended), the total number of horses at the facility (open-ended), the horse’s primary sport/competition discipline (closed-ended), and the presence of foals, mares used for breeding purposes, and/or senior horses (16 y or older) at the facility (closed-ended). Participants could only choose one primary sport/competition discipline for each horse that they enrolled, but they could choose up to 3 disciplines to describe the horses at their home facility. Each owner was assumed to come from a unique home facility unless otherwise indicated in their response (i.e., 1 owner response per home facility). A copy of the enrollment and monthly questionnaires can be obtained from the corresponding author upon request.

Participants who completed the enrollment questionnaire provided informed consent to join the longitudinal study, which was a monthly online questionnaire administered using Qualtrics. A link to the questionnaire was sent by e-mail on the afternoon of the last day of the month and included questions about the participating horses’ movements during that month. For example, the first questionnaire was distributed on the afternoon of May 31st and included questions about horse movements during the month of May. Each questionnaire was unique to the participant so that their response could be identified.

Each monthly questionnaire followed the same design. At the beginning of the questionnaire, the participant was asked if their horse(s) had left the home facility for any duration of time within the month. If the participant responded “no,” their monthly questionnaire entry was complete. If the participant responded “yes,” they continued to answer additional questions regarding these movements. Participants could also report if they no longer owned their horse, which would result in the owner being removed from any additional monthly questionnaires. Participants whose horse(s) travelled during the month were asked to indicate the date(s) that their horse(s) left the home facility. For each chosen date, participants provided details on: i) the reason for travel (closed-ended); ii) the city/town of the destination (open-ended); iii) the name of the destination (e.g., facility name), if available (open-ended); and iv) whether it was an overnight trip (closed-ended). Participants chose the reason
for travel from a drop-down menu, which included the options of: competition, veterinary clinic, off-site lesson, race track, farrier, breeding, sales barn, leisure ride, performance/training clinic, and “other, please specify.” One monthly questionnaire was completed for each horse enrolled by the participant; however, the participant had the option to complete only 1 questionnaire if all of their horses had the exact same travel patterns during that month. Two weeks after the link to the questionnaire was sent, a reminder e-mail was sent to participants who had not completed the monthly questionnaire. Participants were sent monthly invitations regardless of their response (or non-response) to the previous month’s questionnaire. The monthly questionnaires remained active until January 1st, 2016, and participants could follow their questionnaire link until this time if they had forgotten to complete a monthly questionnaire.

Descriptive and statistical analyses

All data were cleaned to remove any spelling errors that arose from participants’ answers to open-ended questions, and were entered into a relational database in Microsoft Access 2016 (Microsoft Corporation, Redmond, Washington, USA). The descriptive analyses of horse and home facility characteristics used the denominator data from the responses to the initial enrollment questionnaire. Descriptions of horse movement patterns were dependent on the participation rate each month. A movement was defined as an event in which a horse was transported from one facility to a unique destination. Movements were described by their directionality to distinguish between temporary (return) movements, and permanent (one-way) movements. A bidirectional movement occurred when a horse returned to its original location after reaching its unique destination (e.g., location A to location B to location A). The number of bidirectional movements presented throughout this manuscript is the sum of the outgoing movement from a facility (e.g., location A to location B) and the return movement back to the original facility (e.g., location B to location A). A unidirectional movement occurred when a horse did not return to its original location after reaching its unique destination (e.g., location A to location B). The total number of movements during the study period was calculated by adding the total sum of movements.

The statistical software packages Stata (Stata Statistical Software: Release 14; Stata Corp 2013, College Station, Texas, USA) and R (R Core Team. 2016. R: A Language and Environment for Statistical Computing; R Foundation for Statistical Computing, Vienna, Austria) were used for all descriptive analyses. Graphs were produced using the “ggplot2” package in R. Statistically significant differences (P < 0.05) between variables with categorical outcomes were assessed using the Fisher’s exact test, and differences between variables with continuous outcomes were assessed using the Wilcoxon rank-sum test.

Results

Questionnaire response

A total of 222 participants completed the initial enrollment questionnaire and provided information on 570 horses (Figure 1). After completing the enrollment questionnaire, 23/222 (10.4%) of owners were lost to follow-up (i.e., did not respond to any questionnaire invitations for the duration of the longitudinal study). A median of 1 horse per participant was enrolled into the study. Owners who were lost to follow-up and owners who provided responses for the entire duration of the study both

Table 1. Distribution of reported primary sport/competition disciplines of horses enrolled in a longitudinal study in Ontario, Canada.

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Number (n = 570)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Racing</td>
<td>18</td>
<td>3.2</td>
</tr>
<tr>
<td>Competition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hunter/Jumper</td>
<td>113</td>
<td>19.8</td>
</tr>
<tr>
<td>Dressage</td>
<td>46</td>
<td>8.1</td>
</tr>
<tr>
<td>Eventing</td>
<td>42</td>
<td>7.4</td>
</tr>
<tr>
<td>Western pleasure</td>
<td>27</td>
<td>4.7</td>
</tr>
<tr>
<td>Driving</td>
<td>26</td>
<td>4.6</td>
</tr>
<tr>
<td>Barrel racing/pole bending</td>
<td>28</td>
<td>4.9</td>
</tr>
<tr>
<td>Breed-specific competitions</td>
<td>21</td>
<td>3.7</td>
</tr>
<tr>
<td>Reining</td>
<td>13</td>
<td>2.3</td>
</tr>
<tr>
<td>Halter/line classes</td>
<td>10</td>
<td>1.8</td>
</tr>
<tr>
<td>Gymkhana</td>
<td>9</td>
<td>1.6</td>
</tr>
<tr>
<td>Competitive trail riding</td>
<td>9</td>
<td>1.6</td>
</tr>
<tr>
<td>Othera</td>
<td>17</td>
<td>3.0</td>
</tr>
<tr>
<td>Leisure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pleasure riding</td>
<td>99</td>
<td>17.4</td>
</tr>
<tr>
<td>Retired</td>
<td>42</td>
<td>7.4</td>
</tr>
<tr>
<td>Non-competitive trail riding</td>
<td>36</td>
<td>6.3</td>
</tr>
<tr>
<td>Otherb</td>
<td>13</td>
<td>2.3</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>0.2</td>
</tr>
</tbody>
</table>

- Participant responses include breeding, cutting, endurance, English and Western dressage, extreme cowboy, fox hunting, and roping.
- Participant responses include cattle sorting, English and Western pleasure, flat work, yearlings in training, and therapy work.
enrolled a median of 1 horse per participant \( (P = 0.94) \). Owners who were lost to follow-up had a shorter elapsed time between their initial enrollment and the start of the longitudinal study [median = 59 d, interquartile range (IQR): 58 to 69 d] compared to owners who provided responses for the entire duration of the study (median = 64 d, IQR: 45 to 69 d) \( (P = 0.39) \). The 23 owners who were lost to follow-up and their corresponding 63 horses were excluded from the longitudinal study analysis. In addition, 18 horses were excluded from the longitudinal study as their owners identified they no longer owned these horses before the first monthly questionnaire. A final total of 199 owners and 489 horses were included in the longitudinal study analysis.

Participation rates for each month of the longitudinal study are presented in Figure 1. Forty-four percent (87/199) of participants provided responses for all 7 mo. Participants who responded for fewer than 7 mo were not considered lost to follow-up because responses could occur during select months of the study (e.g., they could respond 1 mo, miss the second month, and respond the third month). Most participants completed the monthly questionnaire within 2 d of receiving the invitation, as the median response time per month ranged between zero (i.e., completed the same day) and 2 d.

Six percent (29/489) of horses were withdrawn from the longitudinal study (Figure 1). Seventy-nine percent (23/29) of horses that were withdrawn from the longitudinal study left for unreported reasons (i.e., owner simply indicated that they no longer owned that horse). Horses that were withdrawn from the longitudinal study were of similar age (median = 10 y, IQR: 6 to 13 y).

Figure 2. A – Proportion of horses vaccinated per primary sport/competition discipline category based on responses to the initial enrollment questionnaire \( (n = 570 \) horses, disciplines listed in Table 1). Letters indicate statistically significant differences \( (P < 0.05) \) of pairwise comparisons using the Fisher’s exact test \( (a = leisure \) as referent, \( b = racing \) as referent). B – Age of vaccinated and unvaccinated horses for each pathogen. The bottom and top of each box represent the 25th and 75th percentiles, respectively, and the horizontal line within the box represents the median. The asterisk indicates statistically significant differences \( (P < 0.05) \) tested using the Wilcoxon rank-sum test. EI – equine influenza, WNV – West Nile virus; EEE/EEE – Eastern/Western equine encephalitis; EHV – equine herpesvirus.
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The number of bidirectional and unidirectional horse movements between May and November 2015, based on owner-completed monthly questionnaires during a longitudinal study in Ontario, Canada.

<table>
<thead>
<tr>
<th>Month</th>
<th>Number of horses that travelled</th>
<th>Movements</th>
<th>Number (%) of total movements per discipline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Bidirectional</td>
<td>Unidirectional</td>
</tr>
<tr>
<td>May</td>
<td>159</td>
<td>550</td>
<td>24</td>
</tr>
<tr>
<td>June</td>
<td>134</td>
<td>484</td>
<td>10</td>
</tr>
<tr>
<td>July</td>
<td>117</td>
<td>490</td>
<td>9</td>
</tr>
<tr>
<td>August</td>
<td>106</td>
<td>508</td>
<td>7</td>
</tr>
<tr>
<td>September</td>
<td>102</td>
<td>394</td>
<td>10</td>
</tr>
<tr>
<td>October</td>
<td>97</td>
<td>276</td>
<td>14</td>
</tr>
<tr>
<td>November</td>
<td>73</td>
<td>210</td>
<td>15</td>
</tr>
</tbody>
</table>

* Presented as the total sum of the outgoing movement from a facility and the return movement to the original facility.
* Dashes indicate missing data due to owner non-response.

The number of horses that travelled each month, and the number of movements made per horse given that it travelled during the month, based on owner-completed monthly questionnaires during a longitudinal study in Ontario, Canada.

<table>
<thead>
<tr>
<th>Month</th>
<th>Travelled</th>
<th>Proportion travelled (%)</th>
<th>Median (IQR) number of movements per horse</th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td>Yes 159</td>
<td>262 489</td>
<td>32.5 (2 to 4)</td>
</tr>
<tr>
<td>June</td>
<td>No 134</td>
<td>247 485</td>
<td>27.6 (2 to 6)</td>
</tr>
<tr>
<td>July</td>
<td>Yes 117</td>
<td>227 483</td>
<td>24.2 (4 to 2)</td>
</tr>
<tr>
<td>August</td>
<td>Yes 106</td>
<td>200 480</td>
<td>22.1 (4 to 2)</td>
</tr>
<tr>
<td>September</td>
<td>Yes 102</td>
<td>208 476</td>
<td>21.4 (4 to 2)</td>
</tr>
<tr>
<td>October</td>
<td>Yes 97</td>
<td>220 468</td>
<td>20.7 (4 to 2)</td>
</tr>
<tr>
<td>November</td>
<td>Yes 73</td>
<td>261 461</td>
<td>15.8 (2 to 2)</td>
</tr>
</tbody>
</table>

* The number of horses included in the study each month, after accounting for losses due to withdrawals.
* Given that the horse travelled at least once during the month.
* IQR — interquartile range.

With the exception of vaccination against Eastern/Western equine encephalitis (Figure 2).

The median number of horses boarded at a home facility was 15 (IQR: 5 to 25). Of the 222 participants 61% reported that 4 or more owners had horses at their home facility, 15.3% reported that 2 or 3 owners had horses at the facility, and 23.9% reported that they were the sole owner of all horses at the facility. Eighty-two percent of participants stated that there were senior horses (16 y of age or older) present at the home facility, 29.3% indicated the presence of mares used for breeding purposes, and 25.2% indicated the presence of foals.

Twenty-four percent of the 222 participants stated that the horses boarded at their home facility competed in the same primary sport/competition discipline (e.g., they all were dressage horses), while 76.1% of participants stated that the horses boarded at their home facility did not compete in the same discipline (e.g., some were dressage horses and some were hunter/jumper horses). Of the home facilities with a mixture of primary sport/competition disciplines, 16.6% (28/169) involved 2 disciplines, 59.8% (101/169) involved 3 disciplines, and 23.7% (40/169) were a mixture of 4 or more disciplines.

The median age of the participating horses was 11 y (IQR: 8 to 16 y). Fifteen percent (312/570) of horses were geldings, 42.8% (244/570) were mares, and 2.5% (14/570) were stallions. The top 2 sport/competition disciplines captured in this study were hunter/jumper (19.8%, 113/570) and pleasure riding (17.4%, 99/570) (Table 1). When categorized, 63.3% (361/570) of horses participated in a competitive discipline, 33.3% (190/570) of horses participated in leisure activities, and 3.2% (18/570) of horses participated in racing.

Within the 12 mo prior to the study, participating horses (n = 570) were vaccinated against equine influenza (57.9%), rabies (76.8%), Streptococcus equi (20.5%), West Nile virus (67.2%), Eastern/Western equine encephalitis (52.1%), equine herpesvirus (46.7%), and tetanus (79.5%). Fourteen percent of the horses had not received any vaccinations in the past 12 mo. The proportion of horses vaccinated against each pathogen varied depending on the primary sport/competition discipline of the horse, but did not vary significantly by age, with the exception of vaccination against Eastern/Western equine encephalitis (Figure 2).

The median number of horses boarded at a home facility was 15 (IQR: 5 to 25). Of the 222 participants 61% reported that 4 or more owners had horses at their home facility, 15.3% reported that 2 or 3 owners had horses at the facility, and 23.9% reported that they were the sole owner of all horses at the facility. Eighty-two percent of participants stated that there were senior horses (16 y of age or older) present at the home facility, 29.3% indicated the presence of mares used for breeding purposes, and 25.2% indicated the presence of foals.

Twenty-four percent of the 222 participants stated that the horses boarded at their home facility competed in the same primary sport/competition discipline (e.g., they all were dressage horses), while 76.1% of participants stated that the horses boarded at their home facility did not compete in the same discipline (e.g., some were dressage horses and some were hunter/jumper horses). Of the home facilities with a mixture of primary sport/competition disciplines, 16.6% (28/169) involved 2 disciplines, 59.8% (101/169) involved 3 disciplines, and 23.7% (40/169) were a mixture of 4 or more disciplines.

A total of 3001 horse movements occurred throughout the duration of the study (Table 2). The highest proportion of horse movements (574/3001) occurred in May, while the smallest proportion of horse movements (225/3001) occurred in November (Table 2). The proportion of horses that travelled per month ranged from 32.5% (159/489) in May to 15.8% (73/461) in November (Table 3). The median number of movements per horse, given that the horse travelled at least once during the month, peaked during the months of July, August, and September (Table 3). From May to September, most movements were to attend a competition (34.5 to 46.9% of movements each month) (Figure 3). In October, most movements were for leisure rides (31.7%, 92/290), and in November, most movements were to attend a lesson (31.1%, 70/225). Examples of “other” reasons for travel provided by participants included: letting their pasture grow, foxhunting, moving to a new home facility, community
events (e.g., horse drawn funerals, wagon rides, parades), house/horse sitting, visiting a friend, and cattle sorting.

Ninety-seven percent of the 3001 horse movements during the study period were bidirectional and 3% were unidirectional (Table 2). Fifty-seven percent (51/89) of unidirectional movements were permanent moves to new home facilities (i.e., the horse did not return to its original home facility). Most of these permanent movements occurred in May (33%, 17/51), October (22%, 11/51), or November (22%, 11/51). Throughout the study period, there were 5 horses that stopped at multiple locations between their first departure location and their final destination location. During a permanent move to a new home facility, 2 horses made one stop each, and 1 horse made 4 stops between their previous home facility and their new home facility. In another instance, 2 horses left their respective home facilities to attend a competition, but stayed overnight at a different venue before returning to the competition the following day.

While 98.3% of the 3001 movements over the 7-month period occurred locally within Ontario, 0.5% of movements were to locations outside of Ontario (but within Canada), and 1.2% were international movements to the United States. Of the movements to the United States, 94% (33/35) were to attend a competition, and 6% (2/35) were to attend a performance/training clinic. Most international movements occurred in June, in which there were 12 movements to attend 2 competitions. These movements were made by 4 horses owned by 1 participant; 2 horses each attended 1 competition, and 2 horses attended both competitions. Of the movements to different provinces, 87% (13/15) were to attend competitions, and 13% (2/15) were to attend performance/training clinics.

**Discussion**

This study provides an overview of the descriptive characteristics and movement patterns of a sample of horses in Ontario. This study also provides insight into the characteristics of a sample of home facilities in Ontario, including the variable distribution of primary sport/competition disciplines within each facility. The findings in this study contribute to a better understanding of the demographics of a sample of horses in Ontario, in addition to the frequency and reasons for traveling on/off their home facilities.

To the authors’ knowledge, this study provides the first characterization of long-term horse movement patterns in Ontario.

Ninety-seven percent of horse movements throughout the study were bidirectional, where horses returned to their original location or moved to a new facility. The proportion of movements to different destinations varied throughout the study period, with May, October, and November having the highest number of movements.

![Figure 3](https://example.com/figure3.png)

**Figure 3.** The reason for horse movements on/off the home facility per month, based on owner-completed questionnaires during a longitudinal study from May to November 2015 in Ontario, Canada (n = 3001 movements). The total number of movements per month is provided in Table 2.
home facility after visiting a location elsewhere. In contrast to other livestock animals, the local movement of horses is often temporary (1,14). Given the bidirectional nature of most horse movements, it may be beneficial to implement infection prevention strategies for short-term movements on/off a facility. Ensuring that horse owners implement basic biosecurity practices, such as horse health monitoring, cleaning and disinfection of equipment/facilities, and having an individualized vaccination plan can reduce the risk of introduction and spread of disease (19).

Most participants (76.1%) reported that the horses boarded at their home facilities included a mixture of horses from primary sport/competition disciplines. This finding was different from those reported based on a survey of equine facilities in New Zealand, where 57.1% of facilities kept horses for a single purpose (7). This finding suggests that connections between different disciplines in the population may be facilitated through co-boarding of horses at home facilities. Connectivity between disciplines might increase the opportunities for spread of disease should a pathogen be introduced into horses of a single discipline (14).

In this study, horses that participated in competition and leisure disciplines had high vaccine coverage levels for the recommended “core” vaccines, which include vaccines for rabies, tetanus, and West Nile virus (20). In addition, reported vaccine coverage levels were higher in horses that participated in competition and leisure disciplines compared to horses that participated in racing. It is important to note that vaccination of horses in Ontario is voluntary, and therefore vaccination is not mandatory for horses to participate in shows or compete in racing events (20). Although the extent of vaccine coverage for equine respiratory diseases such as equine influenza and equine herpesvirus has been previously reported during outbreaks in Ontario (21,22), the current study describes the vaccine profile of a sample of Ontario horses in a non-outbreak context.

Online questionnaires have been used to describe horse characteristics and horse movement patterns in other equine populations (11,15). According to an industry-led study of Canadian horse owners in 2010, 89.2% of owners used the Internet, and 15.9% of those who did not use the Internet at that time expected to become users by 2011 (23). This suggests that a similar or higher proportion of horse owners would be Internet-users in 2015, and therefore the use of an online questionnaire likely did not explicitly exclude potential participants. The use of the monthly questionnaire attempted to decrease inaccurate recall, as it was thought that participants would be more likely to accurately remember their travel patterns within a short time frame. Participants may experience inaccurate recall if they travelled often with their horse, and had difficulty recalling which trips occurred on which date(s). Issues with recall may therefore affect the accuracy of the timeline of movements if the participant responded with the incorrect movement pattern, or if the participant did not provide a response at all. Nevertheless, the approach used in this study provides a more detailed and timely collection of long-term horse movement patterns compared to previous questionnaire-based approaches (8,9,14,15).

Due to the use of convenience sampling in this study, the potential impacts of selection bias should be considered. Participants could have had an increased likelihood of joining the study due to their personal perceptions or interests (e.g., travelling often increases a horse’s risk for disease exposure), and therefore the sample of horse owners included in this study may have different travel patterns compared to the general horse owner in Ontario. Furthermore, it should be noted that horses in the racing industry were underrepresented in this study, and those that did participate were lost to follow-up after 2 mo (no responses were received for race horses between July and November 2015). Due to the underrepresentation of race horses herein, further research is warranted to examine the demographics and movement patterns of horses in the racing industry. Lastly, as horse movement patterns were only collected from May to November, the resulting movements should not be extrapolated over an entire year, as there may be important differences in the frequency of equestrian activities that occur during the winter, compared to summer and fall.

This study provides the first comprehensive description of a subset of horses in Ontario, following the industry-led study of Canadian horse owners in 2010 (22). While this study may not be representative of the entire horse population in Ontario, it provides insight into the descriptive characteristics of a subset of horses and horse facilities in Ontario, in addition to a refined understanding of their movement patterns. Furthermore, this study provides estimates of the vaccine coverage for various equine pathogens in this sample of horses. The detailed movement data collected in this study provide several opportunities for future research, including the use of spatial and network analyses to identify patterns in horse movements throughout the study period. The results of this study can inform further exploration of the potential for disease introduction and spread within the Ontario equine population.

Acknowledgments

The authors gratefully acknowledge the horse owners who participated in this study, and Karen Richardson for assisting in data entry. This work was supported by the OMAFRA-U of G Research Partnership, Equine Guelph, and the Canada Research Chairs program. Graduate student funding for KS was provided by an Ontario Graduate Scholarship and an Ontario Veterinary College Scholarship.

References


Self-Assessment Color Review, Veterinary Cytology: Dog, Cat, Horse, and Cow, 2nd edition


One of several in the Self-Assessment Color Review series, Veterinary Cytology offers a wide array of cytology cases to study. Although not exhaustive, it does offer a representative series of diagnostic scenarios for various species. Updated from the 1st edition 10 years previous, the 2nd edition continues to focus on teaching cytology with a practical and clinical approach. Clinical cases lend a more “real life” interpretation and discussion of the cytology slides provided. This leads to a richer self-study experience, but would not, however, make it a very useful reference resource. But then the text does not profess to be one.

It is important to be rigorous in one description of cells and features noted and to become familiar with what “normal” looks like. Only then can a useful interpretation be made, offering significance, differential diagnoses, or prognoses. Each case is explored with several questions, forcing this routine approach in every case, eventually making it habitual. Questions with answers only found in the back of the text also allow the student to ponder the case free of the temptation to peak at the answer too soon. There are cases involving cats, dogs, cows, and horses; however, there is only a systems organization to these cases, and jumping from cat to horse back to dog can become a bit confusing. It might also be frustrating if the reader only wanted to study the cytology concerns of a single species.

Overall, this text can be quite useful in self-study. The interpretive guidance offered is excellent and thorough, making Veterinary Cytology worth purchasing.

Reviewed by Janeen Junaid, DVM MVSc, Locum/Associate Small Animal Veterinarian, Hamilton and surrounding area, Ontario.
Article

Effects of alfaxalone, thiopental, or propofol and diazepam on laryngeal motion in healthy dogs

Barbara Ambros, M. Casey Gaunt, Tanya Duke-Novakovski, Susan M. Taylor

Abstract — Laryngeal function is assessed by direct visualization of the larynx under a light plane of anesthesia. This study compared the effects of 3 anesthetic protocols on arytenoid motion in healthy dogs. Eight dogs were randomly assigned to receive alfaxalone, propofol and diazepam, or thiopental. Videolaryngoscopy was performed and still images at maximum inspiration and expiration were used to measure the area and height of the glottal gap. The normalized glottal gap area (NGGA = area in pixels/height²) was calculated. The NGGA change was defined as the difference between NGGA during inspiration and expiration. Data were analyzed using Mann-Whitney and Kruskal-Wallis tests, P-values < 0.05 were considered statistically significant. No significant difference among induction protocols was found when comparing NGGA change after induction or before recovery. Alfaxalone and propofol/diazepam are useful for evaluation of laryngeal function when administered to effect and a light plane of anesthesia is maintained.


(Traduit par Isabelle Vallières)

Can Vet J 2018;59:791–795

Introduction

Laryngeal paralysis is a common cause of upper respiratory tract obstruction in dogs (1,2). Clinical diagnosis of laryngeal paralysis is usually made during laryngoscopy under a light plane of anesthesia to permit retraction of the jaws so that a laryngoscope or videolaryngoscope can be inserted to view the larynx (3). Analgesics, sedatives, and anesthesia induction agents used to facilitate restraint for laryngeal examination may inhibit laryngeal motion (3,4). Several anesthetic induction protocols for evaluation of laryngeal function have been assessed in dogs. One study reported that after use of butorphanol and glycopyrrrolate as preanesthetic medication, propofol or thiopental was superior to the combination of ketamine-diazepam for the evaluation of laryngeal motion in dogs (5). A second study found that thiopental administered to effect was a better choice for assessment of laryngeal function in unpremedicated dogs than propofol or ketamine-diazepam (4). Recent lack of availability of thiopental makes propofol the anesthesia induction agent most commonly recommended for the evaluation of laryngeal function in dogs (2). Alfaxalone is a short-acting steroid anesthetic induction agent. Like propofol, alfaxalone produces good muscle relaxation and a rapid and smooth induction (6). One
recent study used a subjective scoring system to assess laryngeal function and reported that thiopental, propofol, and alfaxalone administration had similar effects on arytenoid motion (7).

The objective of our study was to compare the effects of alfaxalone, propofol co-administered with diazepam, and thiopental on arytenoid motion in normal dogs during tidal breathing by comparing normalized glottal gap areas during inspiration and expiration. We hypothesized that there would be no difference among the 3 anesthetic protocols and that alfaxalone and the combination of propofol and diazepam would be appropriate for laryngeal examination.

Materials and methods

Animals

This study was approved by the University of Saskatchewan’s Animal Research Ethics Board (protocol 20090080). Eight adult medium- to large-breed client-owned dogs [mean weight 24 ± 11.0 kg standard deviation (SD); range: 8.5 to 39.4 kg] that were scheduled to undergo anesthesia for dental cleaning for another research project were enrolled in the study after obtaining informed and written owner consent. Dogs had no previous history of respiratory dysfunction and were determined to be healthy based on physical examination. Results of a complete blood (cell) count (CBC) and serum chemistry analysis were within accepted normal limits for our laboratory.

Experimental design

Each dog was administered 3 anesthetic induction protocols in a random order with a minimum rest period of 14 d between treatments. Each anesthetic protocol consisted of an initial dose administered to effect over 1 min and possible top-up boluses: Thiopental 2.5% (Vétoquinol Canada, Lavatrie, Quebec), 10 mg/kg body weight (BW), top-up bolus 2.5 mg/kg BW; Alfaxalone 1% (Alfaxan-CD RTU; Jurox Pty, Rutherford, NSW, Australia), 2 mg/kg BW, top-up bolus 0.5 mg/kg BW; and Propofol/Diazepam: propofol 1% (Rapinovet; Schering-Plough Animal Health, Kirkland, Quebec), 2 mg/kg BW administered first, followed by diazepam (5 mg/mL, Diazepam Injection USP; Sandoz Canada, Boucherville, Quebec), 0.4 mg/kg BW, then propofol, 1 mg/kg BW, given to effect, top-up bolus of 0.5 mg/kg BW if needed.

Thirty minutes after the topical application of lidocaine/prilocaine cream (EMLA Cream; AstraZeneca, Mississauga, Ontario) a 20-gauge over-the-needle catheter (BD Insyte-W; Becton Dickinson, Mississauga, Ontario) was placed aseptically in a cephalic vein. All dogs were pre-oxygenated with a tightly fitting mask for 5 min. The same individual administered the initial dose of all anesthesia induction agents slowly over 1 min to effect and evaluated depth of anesthesia. Endpoint of administration was the achievement of a light plane of anesthesia, defined as relaxation of jaw tone sufficient to visualize the larynx, with absence of a palpebral reflex. If the endpoint was achieved before the end of 1 min, the drug administration was stopped. If the dog was deemed inadequately anesthetized at the end of 1 min, top-up boluses over 10 s were administered until the depth of anesthesia was adequate. Once adequately anesthetized, dogs were positioned in sternal recumbency in a manufactured device to hold the head in the same position for each evaluation.

The holding device consisted of a frame with 2 perpendicular support pillars on each side of the dog’s head. Each of the pillars had a series of holes oriented in a vertical line through which bars were passed to suspend the dog’s head above the table with its mouth in an open position. Two parallel bars passed just behind the canine teeth on the lower and upper jaw, holding the mouth loosely open at a standardized distance of 5 or 7.5 cm. The distance between lower and upper jaw and the distance between the bottom of the device and the lower bar was recorded for each dog in order to standardize the body position for each dog for subsequent treatments.

A 5-mm flexible bronchoscope (Olympus BF-P180 Evis Exera II; Olympus Medical Systems, Tokyo, Japan) connected to a videocassette recorder, was inserted into the mouth and over the tip of the epiglottis to a point where the entire laryngeal ostium was visible on the monitor. To standardize endoscope position, the distance from the tip of the videobronchoscope to the caudal border of the left maxillary canine tooth was measured, marked with tape, and used for the entire examination and for

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Table 1. Median (range) change in normalized glottal gap area (NGGA) measured from 3 breaths after induction and before recovery for 3 anesthetic induction protocols used for evaluation of arytenoid motion of 8 healthy dogs.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Alfaxalone</th>
<th>Propofol and Diazepam</th>
<th>Thiopental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in NGGA after induction</td>
<td>0.025 (0 to 0.132)</td>
<td>0.032 (0 to 0.140)</td>
<td>0.010 (0 to 0.141)</td>
</tr>
<tr>
<td>(units)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in NGGA before recovery</td>
<td>0.012 (0 to 0.163)</td>
<td>0.042 (0 to 0.174)</td>
<td>0.015 (0 to 0.112)</td>
</tr>
<tr>
<td>(units)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dose (mg/kg BW)*</td>
<td>2.6 (2 to 3)</td>
<td>4 (2.5 to 7.5)</td>
<td>14.2 (8.1 to 20)</td>
</tr>
<tr>
<td>Videolaryngoscopy time (s)ᵇ</td>
<td>357 (108 to 603)</td>
<td>381 (69 to 733)</td>
<td>489 (197 to 992)</td>
</tr>
</tbody>
</table>

* Median (range) anesthetic dose and videolaryngoscopy time for examination of arytenoid motion.

ᵇ Mean (range).
each subsequent examination. An assistant observing the respiratory pattern marked the beginning of inspiration with an “x” on the videorecording to help correlate arytenoid movement with the respiratory cycle during subsequent analysis of the video segments. The laryngoscopic examination was recorded from the time the dog was properly positioned until the dog could no longer be safely restrained. At that point the videolaryngoscope was removed from the oropharynx and the dog was re-anesthetized with the same induction agent and intubated for the dental procedure.

### Objective glottal gap measurement

An evaluator unaware of the anesthetic protocol used, performed objective rima glottis measurement using the digitized video segments (Quick Time Player 7.6.3 Pro; Apple Canada, Toronto, Ontario). The first 30 s of videotape immediately after induction that included 3 breaths and the last 30 s immediately before termination of recording of each dog were used for evaluation. The evaluator selected 3 breaths from each defined period that appeared to have the greatest amount of arytenoid motion. Still images of maximal inspiration and of maximal expiration were converted and imported into an image processing program (Adobe Photoshop CS5 extended, Version 12.0 × 64; Adobe Systems, San Jose, California, USA). Height and area of the glottal gap from the 3 still images were measured in pixels 3 times and averaged. The height was measured from the center of the dorsal connection between the arytenoid cartilages to a central point at the base of the vocal cords (Figure 1). The glottal gap area was traced around the arytenoid cartilages to a central point at the base of the vocal cords (Figure 2). Mean height and mean area of the glottal gap from each set of 3 images, measured at inspiration and expiration, were calculated. Mean area measurements from each set of images were normalized against the height [normalized glottal gap area (NGGA) = area/height²] to correct for variation in size of the dog and the distance between the laryngeal ostium and the tip of the endoscope (8,9). The range of arytenoid motion (NGGA change) was determined by subtracting expiratory NGGA from inspiratory NGGA.

### Statistical analysis

A commercial software package (GraphPad Prism 6.0; GraphPad Software, La Jolla, California, USA) was used for statistical analyses. Data were assessed for normality through the D’Agostino & Pearson omnibus normality test. The range of arytenoid motion was compared within groups using a Mann-Whitney test and between groups using a Kruskal-Wallis test. Times of videolaryngoscopy were compared among induction protocols using Friedman test. Statistical significance was set at $P < 0.05$ and power level of $\geq 80\%$.
Results

Apnea (defined as no respirations for > 60 s) after the administration of anesthetic induction drugs was observed in 1, 3, and 2 dogs after alfaxalone, propofol/diazepam, and thiopental administration, respectively. Arytenoid movement was not detected during the entire laryngeal examination in 1 dog anesthetized with alfaxalone and in a different dog anesthetized with thiopental, despite the presence of strong respiratory movements. After propofol/diazepam administration 2 dogs had no laryngeal movement after induction but regained laryngeal movement before recovery. In a different dog no laryngeal movement was detected in the second examination period.

Data were not normally distributed and are presented as median and range. Median dosages of anesthetic drugs to perform videolaryngoscopy were: alfaxalone 2.6 mg/kg BW (range: 2 to 3 mg/kg BW), propofol 4 mg/kg BW (range: 2.5 to 7.5 mg/kg BW), and thiopental 14.2 mg/kg BW (range: 8.1 to 20 mg/kg BW). Arytenoid motion (NGGA change) after induction and before recovery for each induction protocol did not differ (alfaxalone P = 0.5949; propofol/diazepam P = 0.8775; thiopental P = 0.3935). No significant differences were observed when comparing NGGA change for all induction protocols after induction or before recovery (P = 0.7013). The examination times (time that videolaryngoscopy could be performed) of 357 s (range: 108 to 603 s), 381 s (range: 69 to 733 s), and 489 s (range: 197 to 992 s) for alfaxalone, propofol/diazepam, and thiopental, respectively were not significantly different.

Discussion

Methods for evaluating the range of arytenoid motion and changes of the glottal gap area during tidal breathing include the use of a subjective scoring system (5,7) or calculation of the normalized glottal gap area from digitized images (9,10). The results of this study support the hypothesis that there is no difference in arytenoid motion, defined as change in NGGA, after the administration of alfaxalone, propofol/diazepam, or thiopental. Our results are in agreement with a recent study (7) comparing arytenoid motion after alfaxalone, propofol, and thiopental using a subjective scoring system. Comparison of the NGGA after different induction protocols required certain standardizations during the examination to reduce variability of endoscope distance to the larynx in the individual patient. Dogs in our study were placed in a purpose-built device to achieve the same body position and the tip of the endoscope was maintained at the same distance from the larynx while each anesthetic protocol was evaluated. The initial bolus of each induction agent in this study was administered slowly over 1 min to achieve a light plane of anesthesia. Positioning of the dogs in the purpose-built device, however, might have required more muscle relaxation and a higher depth of anesthesia than ideal for routine assessment of laryngeal motion. An excessively deep plane of anesthesia can cause respiratory depression and may impair laryngeal function. Our dose of thiopental was comparable to the dose of thiopental (14 ± 2.26 mg/kg BW) used in nonpremedicated dogs in a previous study, which concluded that thiopental given to effect is the best choice for assessment of laryngeal motion (4). The propofol dose (5.6 ± 1.14 mg/kg BW) used in the aforementioned study was higher than the dose used in our study in which propofol was co-administered with diazepam. Administration of diazepam (0.4 mg/kg BW) reduced the amount of propofol (3.8 ± 0.9 mg/kg BW) required to induce anesthesia in nonpremedicated dogs (11). When a subjective scoring system was used to evaluate arytenoid motion and dogs were only manually restrained, lower doses of alfaxalone [1.2 (1.2 to 1.2) mg/kg BW], thiopental [6.3 (6.0 to 6.6 mg/kg BW) and propofol [2.4 (2.4 to 2.4) mg/kg BW] were sufficient to facilitate retraction of the jaws and achieve oral laryngeal examination (7). We did not perform a pre-anesthetic scoring of the dogs’ excitement but we used client-owned dogs in our study and different temperament and higher excitement levels of our dogs might be another reason for the overall higher doses of anesthetic induction agents used in this study.

The higher doses of induction agent in the current study are also reflected in longer examination periods than in previous studies (7). Longer examination periods might not be beneficial since laryngeal function is usually evaluated both immediately after induction and before recovery. Depth of anesthesia is difficult to standardize at induction and a lighter plane of anesthesia just before recovery might allow for a more accurate assessment of arytenoid motion. However, no significant difference in arytenoid function was detected between these 2 time periods in our study. Another study with similar study design showed no difference in arytenoid motion between the induction and recovery period of 6 dogs (4).

The failure to find a difference between time periods or induction protocols could be due to the small sample size. A prospective power calculation suggested that a sample size of 8 dogs per treatment was adequate and the limitation of a small sample size was reduced by using a randomized, crossover trial. The variability in the current study as demonstrated by a wide range of NGGA changes resulted in lack of statistical significance and in inadequate statistical power.

Another limitation of our study is the lack of a propofol-alone treatment group. Diazepam (0.4 mg/kg BW) reduced the amount of propofol used to induce anesthesia and maintained blood pressure but failed to ameliorate the respiratory depressive effects of propofol (11). In the present study post-induction apnea was observed in more dogs after propofol/diazepam administration (3/8) than after alfaxalone administration (1/8). In contrast, a similar incidence (25%) of post-induction apnea after slow administration of alfaxalone or propofol was reported in a previous study (12). When propofol was combined with the benzodiazepine midazolam, apnea occurred in 4/9 dogs compared with 1/8 dogs after propofol alone (12). Thus, it is possible that diazepam exacerbated the respiratory depressant effects of propofol herein. It is unclear if the co-administration of diazepam had any effect on arytenoid motion. To the authors’ knowledge no studies on the effect of diazepam on arytenoid motion in dogs exist. Further studies are warranted to determine if there is benefit in the co-administration of diazepam with propofol during laryngeal examination.
Our study only used dogs with normal laryngeal function and it is possible that the evaluated anesthetic drug protocols would have a different effect in dogs with laryngeal dysfunction.

Depth of anesthesia required to position dogs in a purpose-built device might be greater than ideal for laryngeal function evaluation and manual positioning for laryngeal function examination should be recommended. Alfaxalone and propofol/diazepam are acceptable alternatives to thiopental for assessment of arytenoid motion in dogs.

Acknowledgments
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Claw disease in the dog: Does your patient have symmetrical lupoid onychodystrophy (SLO)?

Stephen Waisglass

The presenting complaint of claw disease as the only dermatological manifestation is an uncommon occurrence, accounting for 1.3% of dogs presented to a veterinary teaching hospital (1). Symmetrical lupoid onychodystrophy (SLO) has also been called canine symmetrical onychomadesis and symmetric lupoid onychitis. Regardless of its name, however, when one looks at diseases affecting multiple claws on multiple paws, this disease should be by far at the top of any list of differential diagnoses. It would be quite unusual for an infectious paronychia to present with many claws affecting many paws in an otherwise healthy individual.

Onychodystrophy is defined as abnormal claw formation. Onychomadesis is the sloughing of the claws and onychitis (also known as onychia) is inflammation somewhere in the claw unit (1). Given these definitions, one can see how the various disease names could easily be presentations along the same disease spectrum.

Clinical presentation

Symmetrical lupoid onychodystrophy most commonly presents in young to middle-aged dogs. Gordon setters and German shepherd dogs appear to be predisposed, with frequencies varying depending on the location of the study, but it has also been reported in many other breeds including the English setter, akita, bearded collie, boxer, Doberman pinscher, German shorthaired pointer, golden retriever, greyhound, cavalier King Charles spaniel, Labrador retriever, miniature poodle, miniature schnauzer, mixed-breed pointer, Rottweiler, schipperke, silky terrier, Welsh corgi, and West Highland white terrier (1).

Patients with SLO typically present with clinical signs of paw or claw discomfort; the dog may be licking a paw, for example, or the owners may bring the dog to the veterinarian with suspected claw trauma and/or claw avulsion. Should a patient present with a sloughed claw, close inspection of the other claws on all paws is warranted; the trauma may have drawn attention to a more generalized condition. In cases of SLO, multiple claws on multiple paws are affected within a couple of weeks to a few months of the initial onset. Many of the claws exhibit a lifting of the claw plate (Figure 1), sloughing, and associated paronychia. Secondary bacterial infection may occur; the digits may be swollen, and the dog may be lame. Claw regrowth is abnormal (dystrophic) (Figure 2) with most claws being short, brittle, and misshapen (Figure 3).
Pathogenesis

The pathogenesis of SLO in dogs is unknown. Given the breed predispositions, a genetic link would be suspected. DLA class II alleles are associated with genetic risk factors for various autoimmune or immune-mediated diseases. These alleles are associated with risk for the development of SLO in the Gordon setter, supporting the theory that SLO is indeed an autoimmune disease (2).

There may be an association between thyroid disease and SLO. In a retrospective study of 30 dogs and a literature review, Mueller et al (3) reported that 17% of dogs with SLO were diagnosed with hypothyroidism. Antithyroid antibodies in patients with autoimmune thyroiditis may be binding to the claw matrix, with a subsequent lupoid reaction. Many of the thyroid patients in the Mueller et al (3) report, however, were well-controlled with adequate post pill thyroid hormone levels before development of the claw disease. Furthermore, it has been reported that the same DLA haplotype that is associated with SLO in Gordon setters was in fact protective for hypothyroidism; these patients had a reduced risk of hypothyroidism. Thus, any association between SLO and thyroid disease is unclear. Regardless, thyroid evaluation from time to time continues to be recommended in patients diagnosed with SLO.

Adverse food reactions have also been proposed as a possible factor. In the review presented by Mueller et al (3), there was 1 confirmed food allergic dog (and 1 possible additional case). I have personally never diagnosed an adverse reaction in an SLO patient.

Diagnosis

Cytology to assess for bacterial and/or yeast infection is recommended. Bacterial culture may be warranted, as duration of antibiotic treatment may be extensive in cases of deep infection. A hematological and biochemical profile as well as thyroid evaluation serve as a general health assessment and a pre-treatment baseline. Extremely swollen digits should be radiographed to rule out tumor or osteomyelitis.

The diagnosis of SLO can be confirmed histologically. Histopathological confirmation of the disease requires amputation of the 3rd phalanx of an affected digit, as evaluation of the claw plate will be non-diagnostic. The sample is decalcified by the lab and prepared for the pathologist. An affected dewclaw is the best choice, whenever possible. On microscopic evaluation, a hydropic and lichenoid interface dermatitis, a pattern similar to discoid lupus, is seen. There has been some discussion as to whether the histopathological changes are a reaction pattern to an insult in the claw, and not truly diagnostic (1).

Most dermatologists diagnose SLO presumptively based on the clinical signs, physical examination, and history, before considering an amputation. The presentation is typical: an otherwise healthy patient is presented with claw disease alone, affecting multiple claws on multiple paws, usually starting with onychomadesis and progressing to onychodystrophy. Therefore, amputation and histopathology should be reserved for cases in which the typical, gentler immunomodulatory treatments are ineffective, and one needs to rule out other etiologies before starting immunosuppressive therapeutic regimes.

Treatment

In some cases, the nail plate will need to be removed under heavy sedation or anesthesia, to reduce discomfort and/or the risk of the claw getting caught on something in the environment. Other dogs will do well with regular trimming of the distal margin of the avulsing claw.

Fatty acid supplementation is a good start to treatment. It is unclear if the type of fatty acid supplementation is important. Mueller et al (3) concluded that the type of fatty acid was not critical to the treatment outcome. A later study concluded that there was good success in a diet high in omega-3 fatty acids (4).

In that study, the effect of fish oil treatment was compared to the effect of cyclosporine treatment in a population of Gordon setters and English setters diagnosed with canine symmetrical onychomadesis. All dogs were fed a high omega-3 fatty acid diet. One group was supplemented with fish oil and the other with cyclosporine. All dogs, except 1 in the cyclosporine group, showed an improvement in the number of normal claws. The fish oil group improved from a mean of 0/18 normal claws to 14/18 and the cyclosporine group improved from a mean of 5/18 to 15/18. However, the number of patients in this study was small and the patients were limited to 2 breeds (6 Gordon setters and 2 English setters).
It takes time to assess response to treatment. In 1 study of a colony of beagles, claw growth varied from 0.7 to 2.1 mm/wk. Growth slows with age, to about 50% of peak value by 15 y of age (1). While a number of SLO patients respond to fatty acid supplementation alone, many cases require concurrent therapies. Given the time it takes to assess response, one should discuss the options of starting with fatty acid treatment monotherapy versus the use of fatty acid supplementation as adjunctive therapy, along with tetracycline and niacinamide.

Mueller et al (3) considered tetracycline or doxycycline and niacinamide useful combinations for the treatment of SLO. The combination of tetracycline and niacinamide plus fatty acid supplementation and a high fatty acid diet is the initial treatment of choice at our facility. The client should be reminded that niacinamide is to be administered and not niacin. Tetracycline and niacinamide are both dosed at 500 mg, q8h for patients > 10 kg and 250 mg of each, q8h for patients < 10 kg. The SLO treatment review by Mueller et al (3) did not find a significant difference between tetracycline and doxycycline (administered at 5 to 10 mg/kg body weight once daily). However, an anecdotal report was mentioned in which a patient relapsed when tetracycline was changed to doxycycline. Clinical signs subsided when the patient was placed back on tetracycline and niacinamide. Indeed, I have had a similar experience and choose tetracycline over doxycycline whenever possible.

Each dose reduction should be given time to properly assess response. Rechecks are performed no more frequently than every 6 to 8 wk, as long as the patient is stable. If the patient is doing well, decrease the tetracycline and niacinamide to q12h and recheck in 6 more weeks. If the patient is still doing well, then once daily, and so on. In some cases, the treatment can be stopped without relapse, and in others, there is a relapse once the dose gets too low, requiring an increase to the previous frequency. Close inspection of the base of the claw at each visit will help you to determine if things are going in the right direction. It is important to explain to the owners that the end goal of treatment is claws that are not fragile and painful, but rather strong and comfortable. Claws may grow back visually abnormal distally but otherwise functional and solid (Figure 4).

Pentoxifylline is a useful adjunctive treatment in patients whose response to tetracycline, niacinamide, and fatty acids is incomplete. Doses range from 10 to 20 mg/kg body weight (BW) q8h to 25 to 30 mg/kg q12h (preferred).

It is rare, but in some patients these gentler treatments are ineffective. Under these circumstances, the diagnosis should be reassessed, a biopsy performed and, if the SLO diagnosis remains, treatment with prednisone and azathioprine may be indicated.

In summary, the diagnosis of suspected cases of SLO is direct, simple, and often satisfying. Cytology and bacterial culture should be used to rule out a secondary infection. Radiographs may be needed to rule out osteomyelitis or tumor of individual digits. Fungal culture may be considered to rule out dermatomycosis and thyroid function should be assessed from time to time. A food trial may be performed. Diets high in fatty acids can prove quite helpful. Treatment is safe using some or all of: fatty acid supplementation, tetracycline, and niacinamide with the possible addition of pentoxifylline. On occasion, prednisone and/or azathioprine may be needed, but this form of therapy has been extremely rare in my practice. Gentle treatments, while often lifelong, are generally all that is needed for the control and comfort of patients with SLO.

References
Let the good times roll: Results of the 2017 CVMA practice owners economic survey

Chris Doherty

Hot on the heels of a strong 2016, many Canadian veterinarians held high expectations of continued growth in 2017; fortunately, they were not disappointed. Companion animal hospitals enjoyed surges in revenues and net incomes, and an uptick in new clients. On the mixed and large animal side of the equation, a reasonable rate of revenue growth coupled with an extraordinary controlling of expenses allowed net incomes to jump.

Companion animal hospitals

Revenues were the big story for Canadian companion animal hospitals, growing by a sharp 8.6%, to a national weighted average of $583,434 per full-time equivalent (FTE) DVM in 2017. After hitting a high-water mark in 2016, this 2017 figure rushed ahead to a new all-time high. Concurrently, expenses increased by 8.1%, to $404,673. While this nearly kept pace with revenue growth, it did not quite match it, allowing net incomes to spike upwards by 9.6%, to $178,761; this surpasses the previous high attained in 2014.

These headline national weighted average figures can, however, mask regional differences across the provinces. While the Canada-wide results were strong, some provinces did suffer.

Clinics pour animaux de compagnie

Ce sont les revenus qui faisaient les manchettes pour les cliniques pour animaux de compagnie grâce à une forte croissance de 8,6 % pour une moyenne nationale pondérée de 583 434 $ par vétérinaire équivalent temps plein (ETP) en 2017. Après avoir atteint un record en 2016, ce résultat de 2017 a établi une nouvelle marque. Parallèlement, les dépenses ont augmenté de 8,1 % pour s’ériger à 404 673 $. Même si ce chiffre a presque suivi la croissance des revenus, il ne l’a pas égalé, ce qui a permis au bénéfice net de faire un saut de 9,6 % pour s’ériger à 178 761 $; cela dépasse le record précédent établi en 2014.

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downturns. Saskatchewan, New Brunswick, and Newfoundland and Labrador companion animal hospitals saw their provincial average revenues and net incomes decline from 2016 to 2017. This was outweighed by stronger than average revenue expansion in Manitoba and Ontario, and an exceptional rise in net income in Nova Scotia.

It is reasonable, in the face of expanding revenues, that the dollar amount of expenses should grow as well. After all, when a hospital is seeing more clients, providing more services, performing more surgeries, selling more medication, etc., the costs incurred to generate this revenue are expected to climb. For that reason, expenses are frequently expressed as percentage of gross revenue, to allow for meaningful comparisons across provinces and years, when revenue figures can be very different.

After 3 consecutive years of expenses rising as a percentage of gross revenue, Canadian companion animal hospitals were able to buck the trend, with this figure slipping slightly to 69.4%.

Although much focus tends to be placed on revenues, without prudent expense control it is easy for any increases in gross revenue to be eroded, resulting in stagnant or falling net incomes even while a hospital is growing. For this reason, a 2-pronged approach to improving practice profitability is commonly recommended; 1 prong aimed at growing revenue through increasing clients, visits, and fees, and the other aimed at controlling expenses through budgeting and regular assessments to ensure that spending targets are adhered to.

While the news was uniformly positive with regard to financial metrics, client metrics were more of a mixed bag. After rebounding sharply in 2016, the number of current clients per FTE fell by 1.2% in 2017 to a national weighted average of 855. Offsetting this, however, was a substantial 10% rise in the number of new clients per FTE to 220.

Client numbers are one of the main drivers of revenue. A higher number of current clients (defined as those clients who have visited the veterinarian within the past 12 months) will typically result in a higher gross revenue. New clients are also critical, due to the natural attrition of clients (euthanized pet, moved away, etc.).


Il est donc raisonnable de présumer que, lorsque les revenus progressent, les dépenses augmenteront également. Après tout, lorsqu’une clinique accueille plus de clients, offre plus de services, réalise plus de chirurgies, vend plus de médicaments, etc., un accroissement des coûts engagés pour générer ces revenus est à prévoir. Pour cette raison, les dépenses sont fréquemment exprimées en tant que pourcentage des revenus bruts afin de permettre des comparaisons utiles entre les provinces et les années lorsque les revenus peuvent fluctuer considérablement.

Après trois années consécutives de hausses des dépenses en tant que pourcentage des revenus bruts, les cliniques pour animaux de compagnie du Canada ont pu renverser la tendance, car ce chiffre a connu une légère baisse pour se chiffrer à 69,4 %.

Même si on a tendance à insister sur les revenus, il est facile d’éroder une croissance des revenus bruts en l’absence d’un contrôle prudent des dépenses, ce qui se traduirait par la stagnation ou la chute du bénéfice net malgré la croissance d’une clinique.

C’est pour cette raison que l’on recommande généralement une approche en deux volets afin d’améliorer la rentabilité d’une pratique : un volet cible la croissance des revenus par l’augmentation du nombre de clients, l’accroissement des visites et la hausse des tarifs et l’autre volet vise à contrôler les dépenses par la budgétisation et des évaluations régulières afin d’assurer le respect des cibles de dépenses.

Même si les nouvelles étaient collectivement positives concernant les résultats financiers, les données sur la clientèle étaient un peu plus nuancées. Après avoir connu un rebondissement important en 2016, le nombre de clients actuels par ETP a chuté de 1,2 % en 2017 pour s’établir à une moyenne nationale pondérée de 855 clients. Cependant, une hausse
Two strategies targeted at current clients include pre-booking routine appointments and wellness plans. There is a growing body of research to show that these tactics augment client retention and compliance, increase the number of visits per year, and thus help to grow a practice’s revenue.

Although new clients may seem more elusive, requiring extensive marketing efforts to reach, surveys of pet owners consistently show that a recommendation from a trusted friend or family member is the most common way in which a veterinary hospital is selected. Therefore, most hospitals would be well-served to focus on providing great client service to their current clients and encouraging recommendations whenever and however possible.

**Mixed and large animal hospitals**

At first glance, it may appear that while mixed and large animal veterinary hospitals had a good year, it was not as great as companion animal hospitals; revenues climbed by a modest substantially de 10 % des nouveaux clients par ETP, pour un total de 220 clients, a compensé cette baisse.

Le nombre de clients représente l’un des principaux moteurs des revenus. Un nombre supérieur de clients actuels (qui se définissent comme des clients qui ont consulté le vétérinaire au cours des douze derniers mois) se traduira habituellement par des revenus bruts supérieurs. Les nouveaux clients sont aussi importants en raison de l’attrition naturelle des clients (animal euthanasié, déménagement, etc.).

Deux stratégies ciblant les clients actuels incluent la prise de rendez-vous à l’avance et les régimes de bien-être. De plus en plus d’études confirment que ces tactiques facilitent la rétention et l’observance des clients, augmentent le nombre de visites par année et contribuent ainsi à la croissance des revenus d’une clinique.

Même si les nouveaux clients semblent plus rares et qu’il soit nécessaire de déployer des efforts de marketing considérables pour les atteindre, les sondages auprès des propriétaires d’animaux indiquent régulièrement que le choix d’une clinique vétérinaire s’effectue le plus souvent en suivant la recommandation d’un ami ou d’un membre de la famille à qui l’on fait confiance. Par conséquent, la plupart des cliniques devraient se concentrer sur la prestation d’un excellent service à leurs clients actuels et encourager les recommandations le plus souvent possible.

**Cliniques mixtes et pour grands animaux**

Au premier coup d’œil, il peut sembler que même si les cliniques mixtes et pour grands animaux ont connu une bonne année, elle n’était pas aussi bonne que celle des cliniques pour animaux de compagnie. Les revenus ont affiché une hausse modeste de 4,3 % en 2017 pour atteindre une moyenne nationale pondérée de 473 384 $. Cependant, les cliniques ont de nouveau fait preuve d’une capacité extraordinaire de contrôle de leurs dépenses et la croissance des revenus s’est concrétisée par un bond impressionnant de 9,2 % du bénéfice net pour atteindre un nouveau record de 164 703 $.

Comme c’est le cas pour les cliniques pour animaux de compagnie, les données moyennes nationales positives peuvent ne pas être observées par les vétérinaires de toutes les provinces.
4.3% in 2017, to a national weighted average of $473,384. However, by once again demonstrating an extraordinary ability to control their expenses, this revenue growth was leveraged into an impressive 9.2% spike in net incomes, to $164,703, a new high-water mark.

As was the case in companion animal hospitals, the positive national weighted average figures may not resonate with veterinarians in every province. Unfortunately, the average revenues and net incomes declined in Alberta and Manitoba from 2016 to 2017.

When examining the dollar figure of expenses, the impressive feat pulled off by mixed and large animal veterinarians begins to become obvious. Despite climbing revenues, which would normally be associated with higher costs, the national weighted average for expenses increased by only 1.9%.

Expressed as a percentage of revenue, the past 2 years have seen remarkable progress from mixed and large animal hospitals. From a high of 69.4% in 2015, expenses as a percentage of revenue have fallen to 65.3% in 2017.

Clearly, mixed and large animal veterinarians are successfully employing expense control strategies. Whether this is setting a formal budget with scheduled re-assessments, or a less structured approach, they have demonstrated a strong propensity for keeping costs reasonable even as revenues climb. This has been reflected in 2 solid years of net income growth.

One significant risk in good times such as these is that of complacency. It is easy to brush aside strategies for improvement when revenues and net incomes are already on the way up. Even though things are currently running smoothly, there is little downside to implementing budgeting, pre-booking, wellness plans, or any other efforts aimed at controlling expenses and growing revenues. These will allow veterinarians to continue to make hay while the sun shines, yet also prepare for a time when the economy is less cooperative.

Notes: Data for the CVMA Practice Owners Economic Survey is derived from the 2017 Provincial Practice Owner’s Economic Surveys. Provincial averages are weighted based on relative population size to calculate a national weighted average for all metrics. For the purposes of this research, a full-time equivalent veterinarian is assumed to work 1750 hours annually.
What Can’t Be Taught

Confidence gained through experience

Brendon Laing

As high achievers, we spend a great deal of time focusing on where we are going, and not nearly enough on where we have come from and what we have achieved. Sitting down to reminisce about the past few years has been an enlightening experience, and is something every veterinarian should do on a regular basis. As a new graduate, this exercise is also a great way to connect with associate veterinarians and mentors.

The first 4 years of my career flew by. To many new graduates, even 1 year from now may still seem like a lifetime away, and to seasoned veterans, this is only the blink of an eye. The first year transitioning from the safe sheltered ivory walls of academia to the wilderness of practice was the most formidable, terrifying, but ultimately, most rewarding and fulfilling year of my life.

My professional veterinary career started like many before me. One day, I was a carefree student, the next, a doctor whose decisions affected the lives of others. This immense responsibility terrifies so many new graduates, and believe me, it was not lost on me. Because of this, many newly minted veterinarians seek out mentors who purposefully and gradually acclimatize them to practice life, allowing them to slowly build their confidence in their skill set; my experience, however, was a little bit different.

Immediately after graduating, I began working at Town & Country Animal Hospital, which at the time was a mixed animal practice. I bring attention to this because it was always my intention to practice small animal medicine exclusively. So, in my final year, I forwent any large animal clinical experience, and the thought of being in the position of having to practice large animal medicine was anxiety-inducing, to say the least. The practice owners, one of whom I can proudly say is my father, assured me that I’d have plenty of mentorship and backup when necessary. Having both graduated in the 80s, their idea of mentorship, however, was grossly different than what I had envisioned.

Right from the onset, I was treated like an equal and was expected to hit the ground running. During my first week, I had triaged and cut a gastric dilatation-volvulus and reduced a prolapsed uterus — and this was after hours, at night, but with the backup they promised me … over the phone. While my friends from vet school were exclusively seeing wellness visits, I was being scheduled for exploratory laparotomies, cystotomies, and resections and anastomoses. What my mentors understood was that no amount of shadowing or rounds could compare with the education received by experience. C.S. Lewis said it best, “Experience is a brutal teacher, but you learn, my God, do you learn.”

Many new graduates strongly insist that they aren’t well-equipped for practice upon graduating; however, this couldn’t be further from the truth. Becoming a veterinarian, for many, has been a lifelong pursuit. What all new graduates lack is confidence, and the best way to gain it is through experience. Quickly developing confidence in your skills makes the first year in practice much more manageable. As uncomfortable and nerve-racking as it may seem, do yourself a favour and seek out opportunities to sharpen your skills and develop your confidence. Try first and if you need help, develop a plan before going to your mentor, instead of relying on them to bail you out. By doing so, you’ll gain a great deal of respect and your confidence, skill, and knowledge will grow exponentially.

My first week and year in practice might seem frightening to many, but there’s no way I would trade-in those pivotal experiences. The sureness that my mentors helped instill in me early on has helped shape me into the veterinarian that I am today. Within 6 months of graduating, I successfully brought Town & Country Animal Hospital, Whitchurch-Stouffville, Ontario.

Dr. Laing is a practicing small animal veterinarian with an entrepreneurial spirit who is always looking for new ways to serve pet parents and the community. Dr. Laing received his bachelor’s degree from Queen’s University and his veterinary degree from the Ontario Veterinary College, University of Guelph, where he was the recipient of the prestigious Small Animal Surgery Award from the American College of Veterinary Surgeons. After graduation, he joined his father in practice at Town & Country Animal Hospital, making them a rare father-son team. He is the founder of Vet 2 Pet Services and a member of the board of Directors of the Ontario Veterinary Medical Association.

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laparoscopic surgery to our clinic, where I was training my mentors! This is just one example of the many positive changes that we have been able to bring to our patients by helping each other grow.

If I had to summarize all of my experiences and give just one piece of advice, it would be this: Believe in yourself, push yourself, and don't surrender to your doubts. You’re infinitely more skilled and knowledgeable than you know, and remember, there’s a team of people standing right there beside you, supporting you, mentoring you, rooting for you, and believing in you.

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**Answers to Quiz Corner**

**Les réponses du test éclair**

1. **A)** Antidiarrheal drugs should be used only short-term to control fluid loss. Novel protein diets and corticosteroids may be indicated for the treatment of inflammatory bowel disease (IBD). Fenbendazole is indicated for the treatment of common intestinal nematodes and *Giardia*.

   **A)** Les antidiarrhéiques peuvent être utilisés seulement à court terme pour maîtriser la perte de liquide. Les nouvelles diètes protéiniques et les corticostéroïdes sont indiqués pour le traitement de la maladie intestinale inflammatoire. Le fenbendazole est indiqué pour le traitement des nématodes et de *Giardia*.

2. **B)** Superficial necrolytic dermatitis may be associated with phenobarbital administration, mycotoxins, and glucagon-producing tumors.

   **B)** La dermatite nécrolytique superficielle peut être associée à l’administration de phénobarbital, de mycotoxines et de tumeurs produisant du glucagon.

3. **E)** Hematuria throughout urination is consistent with hemorrhage from the kidneys, ureters, or bladder. Lesions in the distal urethra are associated with hematuria at the beginning of urination and hematuria at the end of urination is associated with lesions in the proximal urethra or bladder neck.

   **E)** L’hématurie durant la miction est compatible avec des hémorragies provenant des reins, des uretères ou de la vessie. Les lésions de la partie distale de l’urètre sont associées à de l’hématurie au début de la miction tandis que l’hématurie à la fin de la miction est causée par des lésions de la partie proximale de l’urètre ou du col de la vessie.

4. **E)** A closed fracture of the carpometacarpus does not result in bleeding. The tibiotarsus is located in the leg, not the wing.

   **E)** Une fracture fermée du carpo-métacarpien ne cause pas de saignement. Le tibio-tarsien est localisé dans la jambe et non dans l’aile.

5. **C)** Foot rot is caused by the bacterium *Fusobacterium necrophorum*, which can be treated with a variety of antimicrobials including cephalosporins.

   **C)** Le piétin est causé par la bactérie *Fusobacterium necrophorum* qui peut être traitée par une quantité d’antimicrobiens incluant les céphalosporines.
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