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vet Candy Magazine • September | 2023

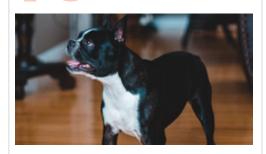


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Welcome to the world of

Dr. Jill Lopez

Dear Vet Candy Readers,

Greetings to all our esteemed readers and fellow animal lovers! We are thrilled to present to you the latest edition of Vet Candy, packed with inspiring stories, valuable insights, and essential updates from the world of veterinary medicine.

On the cover of this issue, we shine the spotlight on a true trailblazer in the field of veterinary technology - Caira Joseph. As you may already know, Caira is not only an exceptional vet tech but also a soon-to-be mom and the Chief Operations Officer at Veterinary Specialty at VOCN. Her dedication, passion, and unwavering commitment to the welfare of animals have earned her the reputation of being unstoppable in her endeavors. We delve into Caira's journey, exploring the challenges she has overcome and the milestones she has achieved. Her story is sure to inspire and motivate all of us in our own respective roles within the veterinary commu-

In our "Practice Management" section, we bring you expert advice and tips on establishing a sustainable veterinary practice. Running a successful veterinary clinic requires not only top-notch medical expertise but also a keen understanding of business principles. Our articles offer guidance on creating an eco-friendly practice, implementing energy-saving measures, and adopting sustainable practices that not only benefit the environment but also contribute to the overall well-being of our patients.

The "Work-Life Balance" section addresses a topic close to the hearts of many veterinary professionals - juggling the demands of parenthood with the responsibilities of work. We understand the unique challenges that come with being a parent in the veterinary field, and in this issue, we share valuable tips and personal stories from veterinarians and vet techs who have managed to strike a harmonious balance between their roles as parents and professionals.

As always, we strive to keep you updated with the latest developments in veterinary medicine. In the "Clinical Updates" section, we delve into a fascinating topic that might surprise some - sleep apnea in dogs. We explore the signs, diagnosis, and treatment options available to help our beloved canine companions when they face this condition. Furthermore, we have a range of other informative articles, including nutrition tips for senior pets, the importance of dental care in small animals, and a heartwarming story of a rescued kitten who found a forever home.

We are committed to bringing you the most relevant and engaging content to enrich your knowledge and enhance your practice. Vet Candy continues to be your go-to source for all things veterinary, and we are grateful for your unwavering support. Thank you for being a part of the Vet Candy community, and we hope you enjoy this issue as much as we enjoyed putting it together. Your feedback is invaluable to us, so please do not hesitate to reach out and share your thoughts.

Wishing you all a wonderful and fulfilling journey in the world of veterinary medicine!

Sincerely,

You heed some self-care/

Dr. Jill <u>L</u>opez Editor-in-chief, Vet Candy



Caira Joseph is Unstoppal

Those working in the field of veterinary medicine are brilliant multitaskers.

After all, you've got to be!

Whether it's giving a wiggly puppy their first vaccinations, talking to clients, or overseeing the day-to-day operations of an animal hospital, vet med professionals are masters when it comes to juggling multiple balls in the air.



Caira Joseph makes it look easy.

At just 27 years old, she is already the Chief Operations Officer (COO) of Vets On Call Network (VOCN), a veterinary technician, and a soon-to-be mother! Even more incredible, she does it all while living with gestational diabetes.

Despite being terrified upon receiving her diagnosis, Caira finds she can now connect more deeply with pet owners who also have beloved fur babies with diabetes.

"This first two weeks are the scariest when your pet is diagnosed with diabetes, but the good news is that it will get much better," Caira tells us.

> Vet Candy is paw-sitively thrilled to introduce this unstoppable woman to our readers. In this issue, Caira shares why she loves her job at veterinary telespecialty platform, VOCN, so much, recalls the most agonizing decision she ever had to make, plus gives us a sneak peak into the five things you'll find in her bag (hint: some are delicious).

> > Introducing, the amazing Caira Joseph!

Overcome Your Fears Forge Your Own Path

Naturally, learning that she had gestational diabetes was a scary moment.

In addition to having to take insulin in the morning, Caira also wears a monitor that checks her glucose throughout the day. However, rather than succumb to worry and fear, Caira instead always tries to look on the bright side. This quality – coupled with self-determination and plenty of patience – it what she credits for her life success.

And what a success story it is.

As mentioned, Caira Joseph is the COO of VOCN's veterinary telespecialty services. In a profession where leaders are often men, Caira has forged her own unique path. She leads the charge, helping to run the business side of things and connecting veterinary specialists with general practices with a goal to make veterinary specialty consultations accessible to all.

"One of my biggest challenges working in a start-up as COO is wearing many hats," says Caira, "Some days I work on our marketing plans and other days I am selling our services to corporate veterinary groups, but the good news is that I never get bored!"

VOCN is a veterinarian-owned, nationally recognized provider of specialty telemedicine solutions for quality-focused practices and was founded by Caira's father, Dr. Richard Joseph, who is a renown veterinary neurologist. VOCN gives veterinary hospitals access to consultations with more than 40 skilled, dedicated, board-certified veterinarians each with a minimum of 10 years of clinical experience.

The Hardest Decision She Ever Made

Nowadays, Caira is excitedly preparing for motherhood.

Looking back, all the trials and tribulations she experienced leading up to her career and personal life victories were worth it. When asked what the most agonizing career decision she had to make was, Caira recalled dropping out of the Mercy College Vet-tech program and switching to a business major.

She explains:

"This is one of the hardest decisions I have ever made, and I really was not sure if it was the right choice for me. After I made the decision, I knew it was the right choice. I have always dreamt of different businesses I could own. In the end, I still got my vet tech degree from another program and now have a business degree as well." Smart move, Caira!

Often, things have a way of working out for the best when you follow your heart.

Caira's final words of advice?

"Always make sure to save some time for you during the day, even on the most stressful days." For her, that means walking the dog, listening to music in the car, and making memories on road trips."

5 things you will always find in Caira's bag:

EOS Chapstick in flavor raspberry: "I hate having chapped lips but I don't like to wear a lot of makeup. EOS is a lip balm with a little hint of color and raspberry is my favorite flavor."



I love drinking water and I am always on the move, but I hate plastic bottles. Instead of plastic bottles 1 always carry a stainless steel water bottle with me because they are not only safe they are durable and infinitely recyclable.



Aveeno lotion (unscented): "Being a vet tech, 1 am always washing my hands which makes them very dry. This stuff is great to keep them moisturized."



Pack of cashews: "Cashews are low in sugar and rich in fiber, heart-healthy fats, and plant protein. I love their buttery taste!"



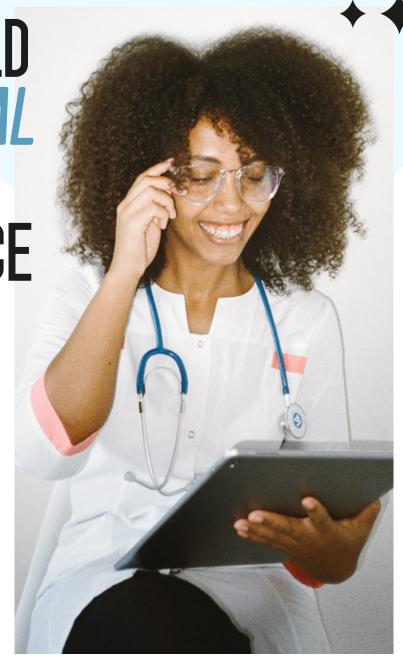
ttippeas — chick pea puffs: "I am a vegan and I avoid gluten and these have been my go-to snack throughout my pregnan-



WHY YOU SHOULD BE USING VIRTUAL **SPECIALISTS** IN YOUR PRACTICE

Telemedicine has emerged as a valuable tool in veterinary medicine, allowing for remote consultations and collaborations between general practitioners and veterinary specialists. This article explores the benefits and applications of telemedicine in connecting general veterinarians with specialists to provide enhanced care for pets. It discusses the impact of telemedicine on diagnostic accuracy, treatment planning, client education, and overall patient outcomes.

Telemedicine in veterinary medicine refers to the use of electronic communication technologies to remotely provide veterinary healthcare services. With the advancements in technology, telemedicine has become increasingly accessible and has proven to be a valuable tool in improving access to specialist expertise and enhancing pet care.



1. Access to Specialized Knowledge:

Telemedicine enables general veterinarians to connect with veterinary specialists, regardless of geographical constraints. This accessibility provides general practitioners with the opportunity to seek expert advice, second opinions, or collaborate on complex cases. By tapping into specialized knowledge, telemedicine expands the breadth of expertise available to veterinarians, leading to improved diagnostic accuracy and treatment outcomes.

2. Expedited Diagnosis and Treatment:

Telemedicine allows for real-time video consultations between general veterinarians and specialists. Through the use of high-quality video conferencing, specialists can remotely assess pets, review medical records, and discuss clinical findings. This expedited process enables timely diagnosis, reduces unnecessary delays, and ensures appropriate treatment planning.

3. Collaborative Treatment Planning:

Telemedicine facilitates collaborative treatment planning between general veterinarians and specialists. Specialists can provide recommendations, suggest advanced diagnostics or treatment modalities, and assist with monitoring disease progression. This collaborative approach enhances the overall quality of care provided to pets, considering a broader range of perspectives and expertise.

4. Client Education and Engagement:

Telemedicine enables veterinary specialists to communicate directly with pet owners, providing education and explanations about complex medical conditions. Through video consultations, specialists can visually demonstrate treatment techniques, review diagnostic images, and answer client questions. This direct communication enhances client understanding, engagement, and compliance, leading to improved patient outcomes.

Continuity of Care:

Telemedicine enhances the continuity of care by bridging the gap between general practitioners and specialists. Through remote consultations, specialists can seamlessly communicate with the primary veterinarian, ensuring a smooth transition of information and ongoing monitoring of the pet's progress. This collaboration minimizes disruptions and improves the overall management of complex cases.

6. Limitations and Considerations:

While telemedicine with veterinary specialists offers numerous benefits, it is important to recognize its limitations and address potential challenges. These include ensuring secure data transmission, maintaining client privacy and confidentiality, and complying with legal and regulatory requirements specific to telemedicine practice.

Future Directions: 7.

The integration of telemedicine in veterinary medicine is an evolving field. Continued advancements in technology, telecommunication infrastructure, and regulatory frameworks will shape its future applications. Further research and collaboration among veterinary professionals, regulatory bodies, and technology providers will be instrumental in optimizing telemedicine practices and expanding its benefits.



Telemedicine with veterinary specialists has the potential to revolutionize pet care by providing timely access to specialized expertise, facilitating collaboration, and improving patient outcomes. As technology continues to advance, the integration of telemedicine into veterinary practices can enhance the quality of care, expand the reach of veterinary expertise, and ultimately contribute to better health and well-being for our beloved animal companions.



In today's world, the need for sustainability and environmental responsibility has become increasingly critical. As veterinary professionals, we have a unique opportunity to make a positive impact on the environment by adopting greener practices within our clinics. By embracing sustainability, we not only contribute to the well-being of the planet but also enhance our reputation as caring and forward-thinking healthcare providers. In this article, we will explore various ways veterinary practices can become greener and sustainable, benefiting both the environment and our profession.

1) Energy Efficiency:

One of the most significant steps a veterinary practice can take towards sustainability is to prioritize energy efficiency. This involves implementing measures to reduce energy consumption and wastage within the clinic. Simple actions such as switching to energy-efficient LED lighting, investing in smart thermostats to regulate heating and cooling, and properly insulating the building can significantly reduce energy usage. Additionally, integrating renewable energy sources like solar panels can further decrease dependence on fossil fuels and contribute to a greener energy grid.

2) Waste Management:

Proper waste management is crucial for maintaining a sustainable veterinary practice. Implementing recycling programs for materials such as paper, plastic, and glass is a fundamental step. Additionally, setting up separate containers for hazardous waste, such as expired medications and chemicals, ensures their proper disposal. Embracing digital records and reducing paper usage not only reduces waste but also streamlines record-keeping processes. Finally, implementing composting systems for organic waste can help minimize the environmental impact of clinic operations.

3) Green Procurement:

The choices we make when sourcing supplies and equipment for our clinics can have a significant environmental impact. By opting for eco-friendly and sustainable products, we can contribute to a greener future. Look for suppliers who prioritize environmentally friendly packaging, use recycled materials, and follow sustainable manufacturing practices. Consider utilizing digital platforms for ordering supplies whenever possible, reducing the need for excess packaging and transportation-related emissions. ASK your sales reps what their companies are doing to make things greener!

4) Water Conservation:

Water is a precious resource, and veterinary practices can play a role in its conservation. Simple steps such as installing low-flow faucets and toilets, fixing leaks promptly, and utilizing water-saving equipment during cleaning procedures can help reduce water consumption.

Additionally, incorporating rainwater harvesting systems for irrigation purposes or investing in drought-resistant landscaping can further conserve water resources.

5) Education and Awareness:

Creating a greener veterinary practice goes beyond implementing physical changes. It requires fostering a culture of sustainability among the entire staft. Educate team members about the importance of environmental conservation, provide training on sustainable practices, and encourage them to actively participate in reducing the clinic's ecological footprint. Engage clients by sharing information about your clinic's sustainability initiatives and providing tips on how they can contribute to a greener lifestyle for their pets.

As veterinary professionals, we have a responsibility to care not only for the well-being of animals but also for the planet we all share. By implementing sustainable practices within our clinics, we can make a tangible difference in reducing our environmental impact. Embracing energy efficiency, effective waste management, green procurement, water conservation, and fostering education and awareness are key steps towards creating greener veterinary practices. Let us join hands and lead the way towards a more sustainable future for our profession, our clients, and our planet.

Remember, every small action counts in building a greener and more sustainable world!





diversity of dog breeds, developed within a relatively short timeframe, holds immense potential for unraveling complex traits, genetic disorders, and even diseases such as cancer. Leveraging cutting-edge technologies, scientists can now delve deep into the genetic makeup of dogs, shedding light on their inner workings and augmenting our understanding of human health and diseases. While the first draft of the dog genome published in 2005 was a monumental achievement, the absence of a reference epigenome historical achievement. me hindered our comprehension of gene regulation and the impact of epigenetic modifications specific to dogs.

Despite the close bond between humans and dogs, there has been a notable dearth of research exploring the shared environmental influences on both species, leaving a critical knowledge gap in understanding the factors affecting their well-being and health.

Understanding the effects of environmental factors necessitates a comprehensive understanding of the dog epigenome. Unlike the relatively inert genome, the epigenome offers invaluable insights into the impact of environmental influences. Studies on twins with identical genomes but distinct lifestyles have revealed striking differences in their epigenetic profiles, underscoring the role of the epigenome in reflecting environmental influences. By delving into the dog epigenome, researchers can unravel the intricate relationship between environmental tactors and gene regulation, shedding light on how dogs respond and adapt to their surroundings.

With their accelerated biological clocks and shorter lifespans compared to humans, dogs act as sentinels, rapidly reacting to environmental risk factors and alerting humans to potential dangers. The dog epigenome emerges as a highly sensitive factor, offering valuable insights. A comprehensive understanding of the dog genome and epigenome is crucial for advancing biomedical sciences and benefiting both animals and humans.

Je-Yoel Cho from Seoul National University, the team unveiled a reference annotation of the dog epigenome, meticulously examining 11 major dog tissues. Through the generation and analysis of diverse epigenomic data, they constructed the world's first comprehensive functional annotation of the dog genome. This groundb-reaking achievement enables the interpretation of the regulatory code governing genome activity, providing fresh insights into biological functions, gene specificity in different cells and tissues, dysregulation of gene activity due to environmental factors, and the occurrence of diseases.

Furthermore, the research team discovered conserved and dynamic functional characteristics shared between different tissues and species. Notably, the dog epigenome exhibited a closer resemblance to the human epigenome than that of mice, suggesting important similarities in gene regulation with potential implications for human health.

The completion of this comprehensive epigenomic map for the dog genome represents a significant milestone in our quest to comprehend the intricate workings of gene regulation. The findings from this pioneering research have the potential to revolutionize biomedical research, facilitating targeted treatments, improved disease management, and enhanced well-being for both dogs and humans.

Professor Cho emphasized, "This groundbreaking epigenome map can be extensively utilized to study ditterent dog breeds, delve into cancer and disease mechanisms, conduct comparative research across species, and significantly contribute to advancements in human life sciences." He added, "This work also signifies a milestone for basic research in veterinary medicine, enabling researchers to unravel the impact of epigenetic modifications on gene expression and opening new avenues for investigating the underlying mechanisms of complex diseases. It paves the way for advancements in veterinary diagnostics, therapeutics, and personalized medicine approaches for dogs.



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- Safe for use in puppies as young as 8 weeks, weighing 4 pounds or more

Contact your Boehringer Ingelheim Sales Representative to learn more

IMPORTANT SAFETY INFORMATION: NexGard® PLUS (afoxolaner, moxidectin, and pyrantel chewable tablets) is for use in dogs only. The most frequently reported adverse reactions reported in clinical trials were diarrhea, vomiting, lethargy, and itching. NexGard PLUS contains afoxolaner, a member of the isoxazoline class, which has been associated with neurologic adverse reactions including tremors, ataxia, and seizures in dogs with or without a history of seizures. Use with caution in dogs with a history of seizures or neurologic disorders. The safe use of NexGard PLUS has not been evaluated in breeding, pregnant, or lactating dogs. Dogs should be tested for existing heartworm infection prior to starting a hear tworm disease preventive. For more information, see full prescribing information or visit NexGardPLUSClinic.com



NexGard PLUS

(afoxolaner, moxidectin. and pyrantel chewable tablets)

For oral use in dogs only Caution: Federal law restricts this drug to use by or on the order of a licensed veterinarian.

Description:

Description:

NexGard* PLUS (afoxolaner, moxidectin, and pyrantel chewable tablets) is available in five sizes of beef-flavored, soft chewables for oral administration to dogs and pupples according to their weight. Each chewable is formulated to provide minimum doses of 1.14 mg/lb (2.5 mg/kg) afoxolaner, 5.45 mg/lb (1.2 mcg/kg) moxidectin, and 2.27 mg/lb (5.0 mg/kg) pyrantel (as pamoate salt).

Afoxolaner is a member of the isoxazoline family of compounds. Its chemical name is 1-Naphthalene-carboxamide, 4-[5-[3-chloro-5-(trifluoromethyl)-phenyl]-4,5-dihydro-5-(trifluoromethyl)-3-isoxazolyl]-N-[2-oxo-2-[(2,2,2-trifluoroethyl)amino]ethyl.

Moxidectin is a semisynthetic macrocyclic lactone derived from the actinomycete Streptomycetes cyaneogriseus noncyanogenus. The chemical name for moxidectin is [6R,23E,25S(E)]-5-0-Demethyl-28-deoxy-25-(1.3-dimethyl-1-butenyl)-6,28-epoxy-23-(methoxyimino) milbernycin B.

Pyrantel is a member of the tetrahydropyrimidine family of compounds. Its chemical name is (E)- 1.4.5,6-Tetrahydro-1-methyl-2-[2-(2-thienyl) vinyl] pyrimidine 4, 4' methylenebis [3-hydroxy-2-naphthoate](1:1).

NexGard* PLUS is indicated for the prevention of heartworm disease caused by Dirofilaria immitis. NexGard* PLUS is indicated for the treatment and control of adult hookworm (Ancylostoma caninum, Ancylostoma braziliense, and Uncinaria stenocephala) and roundworm (Toxocara canis and Toxascaris Jeonina) infections, NexGard® PLUS kills adult fleas and is indicated for the treatment and prevention of fies infestations (Ctenocephalides felis) and the treatment and control of (xodes scapularis (black-legged tick), Rhipicephalus sanguineus (brown dog tick), Dermacentor variabilis (American dog tick), and Amblyomma americanum (lone star tick) infestations for one month in dogs and puppies eight weeks of age and older, weighing four pounds of body weight or greater.

Dosage and Administration: NexGard* PLUS is given orally once a month at the minimum dosage of 1.14 mg/lb (2.5 mg/kg) afoxolaner, 5.45 mcg/lb (1.2 mcg/kg) moxidectin, and 2.27 mg/lb (5.0 mg/kg) pyrantel (as pamoate sait).

For heartworm disease prevention, give once monthly for at least six months after last exposure to mosquitoes (see Effectiveness).

Dosing Schedule:

Body Weight (lbs.)	Afoxolaner Per Chewable (mg)	Moxidectin Per Chewable (mcg)	Pyrantel* Per Chewable (mg)	Chewables Administered		
4 to 8 lbs.	4 to 8 lbs. 9.375 4		18.75	One		
8.1 to 17 lbs.	18.75	90	37.5	One		
17.1 to 33 lbs.	37.5	180	75	One		
33.1 to 66 lbs.	75	360	150	One		
66.1 to 132 lbs.	150	720	300	One		
Over 132 lbs.	Administer the appropriate combination of chewables					

^{*}As pamoate salt.

NexGard* PLUS can be administered with or without food. Care should be taken to ensure that the dog consumes the complete dose and that part of the dose is not lost or refused. If a dose is missed, administer NexGard® PLUS and resume a monthly dosing schedule.

Heartworm Prevention:

NexGard® PLUS should be administered at monthly intervals year-round or, at a minimum, administration should start within one month of the dog's first seasonal exposure to mosquitoes and should continue at monthly intervals until at least six months after the dog's last exposure (see **Effectiveness**). When replacing another monthly heartworm preventive product, the first dose of NexGard® PLUS should be given within a month of the last dose of the former medication.

Flea Treatment and Prevention:

NexGard* PLUS should be administered year-round at monthly intervals or started at least one month before fleas become active. To minimize the likelihood of flea reinfestation, it is important to treat all animals within a household with an approved flea control product.

Tick Treatment and Control: NexGard® PLUS should be administered year-round at monthly intervals or started at least one month before ticks become active.

Intestinal Nematode Treatment and Control

NexGard* PLUS treats and controls adult hookworms (Ancylostoma caninum, Ancylostoma brazillense, and Uncinaria stenocephala) and roundworms (Toxocara canis and Toxascaris leonina). For the treatment of adult hookworm and roundworm infections, NexGard* PLUS should be administered as a single dose. Monthly use of NexGard* PLUS will control any subsequent infections. Dogs may be exposed to and can become infected with hookworms and roundworms throughout the year, regardless of season

Contraindications:

There are no known contraindications for the use of NexGard® PLUS.

Not for use in humans. Keep this and all drugs out of the reach of children. In case of accidental ingestion, contact a physician for treatment advice.

Keep NexGard® PLUS in a secure location out of the reach of dogs, cats, and other animals to prevent accidental ingestion or overdose.

Afoxolaner, one of the ingredients in NexGard® PLUS, is a member of the isoxazoline class. This class has been associated with neurologic adverse reactions including tremors, ataxia, and seizures. Seizures have been reported in dogs receiving isoxazoline class drugs, even in dogs without a history of seizures. Use with caution in dogs with a history of seizures or

Treatment with fewer than six monthly doses after the last exposure to mosquitoes has not been evaluated and may not provide complete heartworm prevention.

Prior to administration of NexGard* PLUS, dogs should be tested for existing heartworm infection. At the discretion of the veterinarian, infected dogs should be treated with an adulticide to remove adult heartworms. NexGard* PLUS is not effective against adult D. immitis.

The safe use of NexGard® PLUS in breeding, pregnant, or lactating dogs has not been evaluated.

In a field safety and effectiveness study, NexGard* PLUS was administered to dogs for the prevention of heartworm disease. The study included a total of 272 dogs (134 administered NexGard* PLUS and 138 administered active control) treated once monthly for 11 treatments. Over the 330-day study period, all observations of potential adverse reactions were recorded. The most frequent reactions reported in the NexGard® PLUS group are presented in the

Table 1. Dogs With Adverse Reactions

Clinical Sign	NexGard® PLUS n = 134 Number (Percentage)	Active Control n = 138 Number (Percentage)		
Diarrhea	9 (6.7%)	7 (5.1%)		
Vomiting	6 (4.5%)	7 (5.1%)		
Lethargy	3 (2.2%)	5 (3.6%)		
Itching	3(2.2%)	3 (2.2%)		
Dermatitis	2 (1.5%)	1(0.7%)		
Anorexia	1(0.7%)	4 (2.9%)		
Muscle tremor	1 (0.7%)	1(0.7%)		

One dog in the NexGard® PLUS group was reported to exhibit muscle tremors along with nausea and depression for one day after the Day 0 treatment. The dog remained in the study and muscle tremors were not reported after any subsequent treatments.

Contact Information

For a copy of the Safety Data Sheet (SDS) or to report suspected adverse drug events, contact Boehringer Ingelheim Animal Health USA Inc. at 1-888-637-4251

For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or www.fda.gov/reportanimalae.

Clinical Pharmacology:

Mode of Action:

NexGard* PLUS (afoxolaner, moxidectin, and pyrantel chewable tablets) contains the three active pharmaceutical ingredients afoxolarier, moxidectin, and pyrantel (as pamoate salt).

Afoxolaner is a member of the isoxazoline family, shown to bind at a binding site to inhibit insect and acarine ligand-gated chloride channels, in particular those gated by the neurotransmitter gamma-aminobutyric acid (GABA), thereby blocking pre- and postsynaptic transfer of chloride ions across cell membranes. Prolonged afoxolaner-induced hyperexcitation results in uncontrolled activity of the central nervous system and death of insects and acarines. The selective toxicity of afoxolaner between insects and acarines and mammals may be inferred by the differential sensitivity of the insects and acarines' GABA receptors versus mammalian GABA receptors.

Moxidectin is an endectocide in the macrocyclic lactone class. Moxidectin acts by interfering with chloride channel-mediated neurotransmission in susceptible parasites, which results in paralysis and death of the parasite.

Pyrantel is a nematocide belonging to the tetrahydropyrimidine class. Pyrantel acts as a depolarizing, neuromuscular-blocking agent in susceptible parasites, causing paralysis and death or expulsion of the parasite.

Pharmacokinetics.

Pharmacokinetics:
Following a single oral administration of a near-final formulation of
NexGard* PLUS (at mean doses of 3.9 mg/kg afloxolaner, 18.8 mg/kg
moxidectin, and 7.8 mg/kg pyrantel pamoate) in fed and fasted Beagle dogs
(10 to 21 months of age), atoxolaner and moxidectin were more rapidly absorbed in the fasted state with a time to maximum concentration (Tmax) of 2 to 3 hours

The afoxolaner mean maximum plasma concentrations (Cmax) in the fed and fasted states were 1610 and 2200 ng/mL (CV=33 and 16%) and the moxidectin mean Cmax values were 11.1 and 15.5 ng/mL (CV=39 and 24%), respectively. The area under the curve (AUC) for afoxolaner and moxidectin were similar between fed and fasted states. Post-dose pyrantel plasma concentrations were quantifiable out to 24 hours.

Following six oral administrations of NexGard[†] PLUS at 1, 3, and 5X the maximum exposure dose of 5 mg/kg, 24 mcg/kg, and 10 mg/kg afoxolaner, moxidectin, and pyrantel parmoate, respectively, every 28 days in 8-week-old Beagle dogs, afoxolaner and moxidectin Tmax ranged from 2 to 6 hours. The observed mean Cmax and AUC at steady state in the 1X dose group were observed mean critic and 1900 days "ng/ml. for a flox claims and 14.8 ng/ml. and 55.2 days "ng/ml. for a flox claims and 14.8 ng/ml. and 55.2 days "ng/ml. for moxidectin, respectively. Based on mean Cmin, a floxolamer and moxidectin accumulated by less than 4-fold at steady state. Afoxolamer and moxidectin exposure increased in a dose proportional manner between the LX and 3X dose groups but was less than dose proportional in the 5X dose group.

Pyrantel pamoate is poorly absorbed into systemic circulation. Pyrantel pamoate is intended to remain in the gastrointestinal tract to allow effective concentrations to be delivered to gastrointestinal nematodes.

Heartworm Prevention:

In two well-controlled laboratory studies, NexGard® PLUS was 100% effective against induced D. immitis infections when administered for six consecutive months.

In a well-controlled US field study consisting of 120 dogs administered NexGard® PLUS and 124 administered an active control, no dogs treated with NexGard* PLUS tested positive for heartworm disease. All dogs treated with NexGard* PLUS were negative for *D. Immitis* antigen and blood microfilariae at study completion on Day 330.

Flea Treatment and Prevention: In a well-controlled laboratory study, NexGard® PLUS demonstrated ≥99.8% effectiveness against adult fleas 24 hours after weekly infestations for

In a separate well-controlled laboratory study, a foxolaner alone began to kill fleas four hours after initial administration and demonstrated >99% effectiveness at eight hours.

In an additional well-controlled laboratory study, afoxolaner alone demonstrated 100% effectiveness against adult fleas 24 hours post-infestation for 35 days and was ≥93% effective at 12 hours post-infestation through Day 21 and on Day 35. On Day 28, afoxolaner alone was 81.1% effective 12 hours post-infestation. Dogs in both the afoxolaner-treated and control groups that were infested with bogs in both the accosiner-treated and control groups tract were mested with fleas on Day 1 generated flea eggs at 12 and 24 hours post-treatment (0-11 eggs and 1-17 eggs in the afoxolaner-treated dogs, and 4-90 eggs and 0-118 eggs in the control dogs, at 12 and 24 hours, respectively). At subsequent evaluations post-infestation, fleas from dogs in the afoxolaner-treated group were essentially unable to produce any eggs (0-1 eggs), while fleas from dogs in the control group continued to produce eggs (1-141 eggs).

In a 90-day US field study conducted in households with existing flea infestations of varying severity, the effectiveness of afoxolaner alone against fleas on the Day 30, 60, and 90 visits compared with baseline was 98.0%, 99.7%, and 99.9%, respectively.

Collectively, the data from the four studies (three laboratory and one field) demonstrate that NexGard® PLUS kills fleas before they can lay eggs, thus preventing subsequent flea infestations after the start of treatment of existing flea infestations.

Tick Treatment and Control:

In well-controlled laboratory studies, afoxolaner alone demonstrated >97% effectiveness against Dermacentor variabilis, >94% effectiveness against Ixodes scapularis, and >93% effectiveness against Rhipicephalus sanguineus, 48 hours post-infestation, for one month. At 72 hours post-infestation, NexGard* PLUS demonstrated ≥97% effectiveness against Amblyomma americanum for one month.

Intestinal Nematode Treatment and Control: Elimination of adult roundworms (Toxocara canis and Toxascaris leonina) and hookworms (Ancylostoma caninum, Ancylostoma braziliense, and Uncinaria steriocephala) was demonstrated in well-controlled laboratory

Target Animal Safety:

Margin of Safety:
NexGard* PLUS was administered orally at 1, 3, and 5X the maximum exp doses at approximately 28-day intervals for six treatments to 8-week-old Beagle puppies. Dogs in the control group were sham-dosed. There were no clinically relevant, treatment-related effects on body weights, food consumption, clinical pathology (hematology, coagulation, serum chemistry, and urinalysis), gross pathology, histopathology, organ weights, or ophthalmic examinations. Mild, self-limiting diarrhea (with and without blood) was possibly related to treatment, as there were more incidences in the NexGard® PLUS groups than the control group throughout the study, including within 48 hours after

Avermectin-Sensitive Collie Safety:
NexGard® PLUS was administered orally at 1, 3, and 5X the maximum label dose to MDR1-deficient Collies once on Day 0, with a second administration to the IX group on Day 28. Dogs in the control group were sharn-dosed on Days 0 and 28. No clinical signs of avermectin toxicity were noted in any dog at any time during the study. Vomiting was observed in some dogs in the 3X and 5X groups and resolved without treatment. Diarrhea, with or without blood, was observed in some dogs in all of the NexGard* PLUS groups and resolved without treatment.

Heartworm-Positive Safety: NexGard® PLUS was administered orally at 1X and 3X the maximum exposure doses at approximately 28-day intervals for three treatments to Beagle dogs with adult heartworm infections and circulating microfilariae. Dogs in the control group were sham-dosed. Diarrhea was observed in one dog in the 1X group and in three dogs in the 3X group, and vomiting was observed in two dogs in the 3X group. No signs of avermectin toxicity were observed at any time during the study. There were no clinical signs associated with death of the microfilariae observed in any of the dogs.

Field Safety: In a well-controlled field study, NexGard® PLUS was used concurrently with other medications such as vaccines, antibiotics, non-steroidal anti-inflammatory drugs (NSAIDs), anesthetics, sedatives, analgesics, steroids, anthelmintics, antiemetics, and antipruritics. No adverse reactions were associated with the concurrent use of NexGard® PLUS and other medications.

How Supplied: NexGard® PLUS is available in five strengths of beef-flavored soft chewables formulated according to the weight of the dog (see **Dosage and Administration**). Each chewable size is available in color-coded packages of 1. 3. or 6 chewables

Storage Information:

Store in original package at or below 25°C (77°F) with excursions permitted up to 40°C (104°F).

Approved by FDA under NADA #141-554

Marketed by: Boehringer Ingelheim Animal Health USA Inc., Duluth, GA 30096

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181531-001 Rev. 09/2022







Childcare is a crucial component of the American workforce, allowing parents to pursue their careers while ensuring their children receive proper care and education. However, the soaring cost of childcare has become a significant burden for families, with reports suggesting that Americans now spend nearly 30% of their income on childcare expenses. While this issue primarily affects families, it also poses a considerable problem for businesses. In this article, we explore the reasons why the high cost of childcare impacts businesses and why finding a solution is crucial for the overall economy.

The Financial Strain on Families:

Childcare costs have skyrocketed over the years, surpassing other essential expenses such as housing and education. For many families, the cost of quality childcare is simply unaffordable, forcing parents to make difficult choices. They may opt to reduce their work hours, decline promotions, or even exit the workforce altogether to care for their children. This reduction in workforce participation can directly impact a family's income and financial stability.

The financial strain of childcare has a ripple effect that extends beyond the household. Businesses suffer as their employees struggle to balance work and family responsibilities.



of childcare is problematic for businesses:

Decreased Employee Productivity:

When parents are burdened with exorbitant childcare expenses, they often face stress, anxiety, and distractions at work. Worries about the affordability and quality of childcare can affect their focus, leading to decreased productivity. Additionally, parents may need to take time off to address childcare-related issues, further impacting their work commitments.

Difficulty in Attracting and Retaining Talent:

In a competitive job market, businesses strive to attract and retain top talent. However, the high cost of childcare presents a significant barrier. Talented individuals, particularly parents, may be hesitant to join or remain with a company that does not offer supportive measures, such as flexible work hours, childcare assistance, or family-friendly policies. This can hinder a company's ability to build a skilled and dedicated workforce.

Limited Consumer Spending:

When a significant portion of a family's income is dedicated to childcare, discretionary spending on goods and services is significantly reduced. Families have less disposable income to invest in local businesses, dine out, shop, or enjoy recreational activities. This decreased consumer spending directly affects the revenue of businesses, particularly those in local communities.

The Need for Solutions:

Addressing the challenges posed by the high cost of childcare requires a collaborative effort from government, businesses, and society as a whole. Here are some potential solutions that can alleviate the burden on families and support businesses:

Government Support and Policies:

Government initiatives, such as subsidies, tax credits, or vouchers, can help make childcare more affordable for families. Policy reforms that promote affordable and accessible childcare options can significantly ease the financial strain on working parents.



Businesses can play a pivotal role by implementing family-friendly policies and benefits. Flexible work hours, remote work options, on-site childcare facilities, or childcare assistance programs can attract and retain talented employees who are also parents. By investing in their workforce's well-being, businesses can foster a more engaged and productive workforce.

Community Partnerships:

Collaborations between businesses, community organizations, and childcare providers can lead to innovative solutions. By pooling resources, businesses can support the development of affordable, high-quality childcare options within the community. These partnerships can create a positive ecosystem that benefits families, businesses, and the overall local economy.

The high cost of childcare in the United States not only places a financial burden on families but also poses significant challenges for businesses. Decreased productivity, difficulties in attracting talent, and limited consumer spending are all consequences of this issue. However, through collaborative efforts, including government support, employer initiatives, and community partnerships, we can strive to find viable solutions. By addressing the cost of childcare, we can create a more equitable and prosperous environment where families thrive, businesses flourish, and the overall economy prospers.



UNVEILING THE HIDDEN SECRETS OF BABESIA ROSSI INFECTION IN DOGS

Babesiosis is a widespread disease that affects both humans and animals, including dogs. It is caused by tiny parasites that live inside red blood cells. Among these parasites, Babesia rossi is particularly dangerous for dogs and can cause severe symptoms. The disease can vary in its presentation, ranging from mild and unnoticed to severe and potentially fatal.

This study aimed to compare the blood protein profiles of dogs with babesiosis and healthy dogs. A total of 32 dogs infected with Babesia rossi were included, with 18 having uncomplicated cases and 14 experiencing complicated cases of the disease. Additionally, 20 healthy dogs were also part of the study.

The researchers found significant differences in the abundance of 78 proteins among the three groups of dogs. By analyzing these proteins and the related pathways, they discovered important variances in processes such as blood clotting, the immune system's initial response, lipid metabolism, and inflammation. This information is valuable in understanding how dogs react to Babesia rossi infection and may contribute to the development of new treatment approaches.

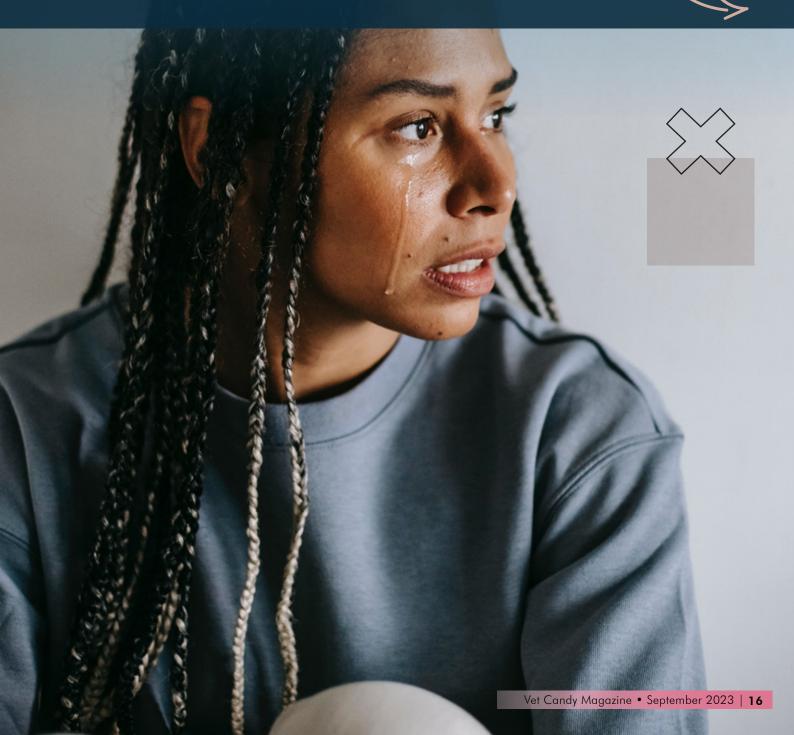
The study's use of a proteomic profiling technique allowed for the identification of potential biomarkers in the dogs' blood, which could help differentiate between mild and severe cases of babesiosis caused by Babesia rossi. These findings have implications for studying the interaction between the host (dogs) and the parasite, as well as for the exploration of new therapeutic targets.

READ MORE BY CLICKING ON THE LINK BELOW:

CLICK HERE

Beyond caring: The dark secret of compassion fatigue in veterinary medicine

Veterinary medicine is a profession built on compassion and empathy, where dedicated professionals tirelessly care for the well-being of animals. However, a hidden enemy silently lurks within the hearts of these compassionate caregivers: compassion fatigue. This insidious condition can drain the very essence of veterinary professionals, leaving them emotionally depleted and at risk of losing their passion. In this gripping article, we uncover the signs of compassion fatigue, its devastating consequences, and most importantly, how to recognize and prevent it to salvage your own well-being.



1. Recognizing the Signs of Compassion Fatigue:

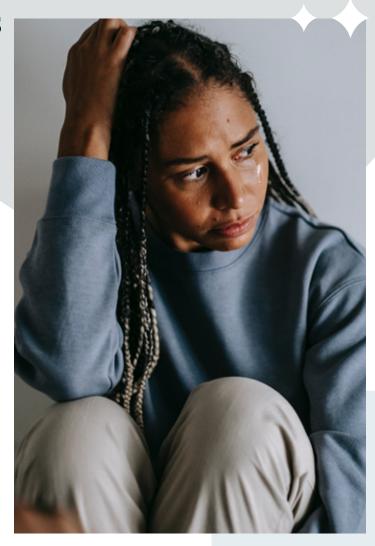
Compassion fatigue is characterized by a gradual erosion of empathy and a sense of emotional exhaustion in individuals who constantly care for others. In the veterinary field, this can manifest as a profound emotional burden, deep sadness, or a feeling of powerlessness. Veterinary professionals experiencing compassion fatigue may find themselves becoming more emotionally detached, experiencing heightened irritability, and displaying signs of anxiety or depression. Persistent feelings of helplessness, sleep disturbances, and a decline in job satisfaction are also telltale signs that should not be ignored.

2. Understanding the Consequences of **Compassion Fatigue:**

Compassion fatigue is characterized by a gradual erosion of empathy and a sense of emotional exhaustion in individuals who constantly care for others. In the veterinary field, this can manifest as a profound emotional burden, deep sadness, or a feeling of powerlessness. Veterinary professionals experiencing compassion fatigue may find themselves becoming more emotionally detached, experiencing heightened irritability, and displaying signs of anxiety or depression. Persistent feelings of helplessness, sleep disturbances, and a decline in job satisfaction are also telltale signs that should not be ignored.

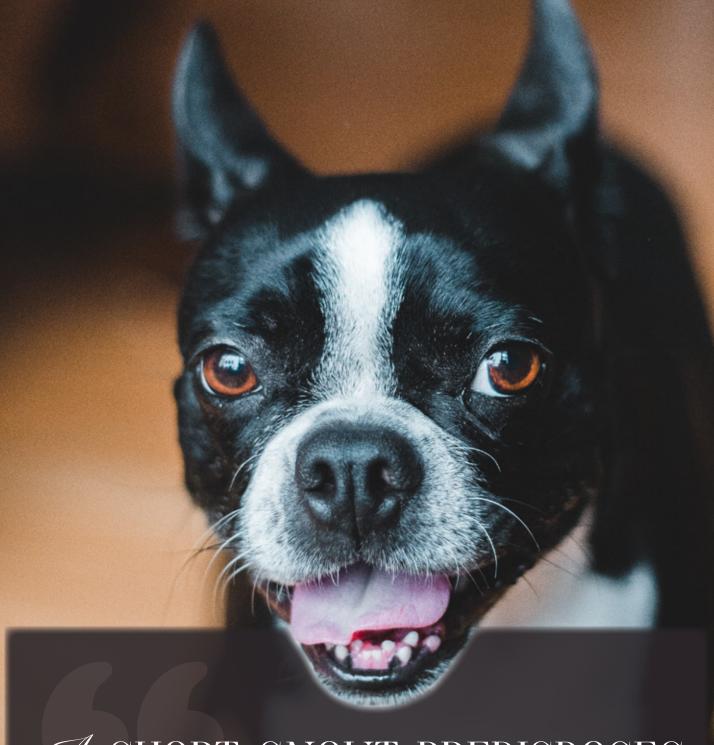
3. Prevention and Rediscovering **Compassion:**

Preventing compassion fatigue requires a proactive approach that focuses on self-care and building resilience. Veterinary professionals must prioritize their own well-being by practicing self-compassion, setting boundaries, and seeking support when needed. Engaging in activities that promote emotional and mental well-being, such as hobbies, exercise, and therapy, can help combat compassion fatigue. Mindfulness and stress reduction techniques, such as meditation or journaling, can also provide invaluable tools to manage the emotional toll of veterinary work.



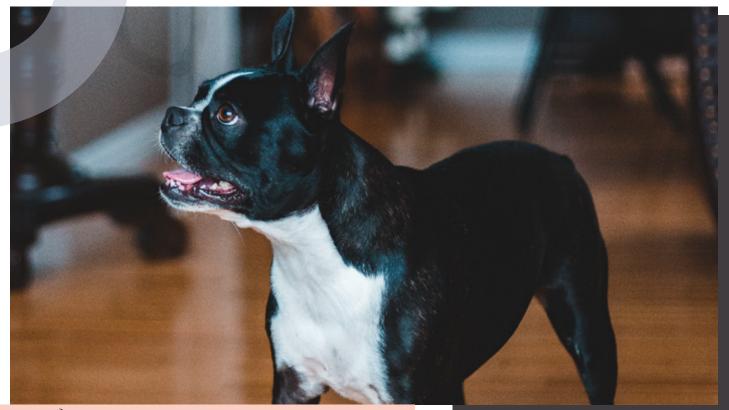
Organizations within the veterinary field play a vital role in preventing and addressing compassion fatigue. Implementing support systems, providing access to counseling services, and promoting a culture of open communication are essential steps. Encouraging self-care practices, fostering team cohesion, and recognizing the importance of work-life balance can help create an environment that protects veterinary professionals from compassion fatigue.

Compassion fatigue is a haunting reality that can silently consume the hearts of veterinary professionals. To ensure their own well-being and sustain their compassion for animal care, it is imperative for veterinary professionals to recognize the signs of compassion fatigue and take proactive measures to prevent it. By prioritizing self-care, seeking support, and fostering a supportive work environment, veterinary professionals can rekindle their passion and deliver the care animals deserve. Let's unveil the dark secret of compassion fatigue and shine a light on the path towards healing and self-preservation in the noble field of veterinary medicine.



SHORT SNOUT PREDISPOSES DOGS TO SLEEP APNEA

University of Helsinki researchers tested a new method of diagnosing sleep-disordered breathing in dogs using a neckband developed for human sleep apnoea diagnostics. The study revealed that sleep-disordered breathing is more prevalent among short-snouted dogs than those with longer snouts.



FRENCH BULLDOGS, PUGS

..and other brachycephalic dog breeds are popular pets. Brachycephalic dogs are shorter-nosed and flat-faced as a result of breeding, making them more susceptible to heat, overexertion and respiratory problems.

In addition, brachycephalic dogs have been found to suffer from recurring episodes of sleep-disordered breathing, resembling human obstructive sleep apnoea caused by upper airway obstruction. During such episodes, normal breathing is interrupted by obstructed airways as the muscles of the upper airways relax, resulting in sleep interruptions and daytime fatigue. Sleep apnoea can have a dramatic impact on both human and canine wellbeing.

"Sleep apnoea places people at considerable risk of conditions such as hypertension and cardiovascular disease. Sleep affects the body's immune system, hormone secretion and metabolism. Sufficient, sound sleep is vital for quality of life. For these reasons and others, we are interested in canine sleep too," explains Doctoral Researcher lida Niinikoski of the University of Helsinki's Faculty of Veterinary Medicine.

"Previous methods for investigating sleep apnoea have required dogs to sleep either while connected to all sorts of equipment or within a certain type of box in a lab. This has made research challenging and limited our knowledge of dog sleep apnoea."

The University of Helsinki Lung Insight research group investigated breathing during sleep in dogs using a neckband system developed originally for diagnosing human sleep apnoea.

The group measured breathing during sleep using the screening device in the dogs' home environment. Brachycephalic dogs recorded a much higher number of sleep-disordered breathing events than dogs with longer snouts. The short-nosed dogs also snored more than their long-nosed counterparts.

The neckband system was found to be an easy-to-use method for measuring sleep-disordered breathing. Although its use is currently limited to patients involved in research, in the future it may provide novel opportunities for dog sleep apnoea diagnostics in other contexts too.

Next, the research group will explore factors predisposing dogs to sleep apnoea.

As Niinikoski believes, "Good sleep is vital for the health of both humans and our animal friends."

Beware emergency med, new research sheds light on how shift work may influence fertility

Only four weeks of shift work-like patterns in female mice are enough to disrupt their biological clock and reduce fertility, according to research presented at the 25th European Congress of Endocrinology. The findings help scientists better understand how circadian disturbances impact female fertility, which could eventually lead to future prevention strategies for women working in non-standard work schedules.

The circadian rhythm is generated by the body's internal clocks which are synchronised to a 24-hour period, mostly by changes in light across days. These clocks regulate various biological functions and processes, including the sleep-wake cycle, hormone secretion, digestion and reproduction, but can easily be disrupted by inappropriate light exposure, such as light at night.

The 'master biological clock' is located in the suprachiasmatic nuclei, a small region in the centre of the brain called the hypothalamus. The hypothalamus is also the regulatory centre for reproductive function by acting on the pituitary gland – attached to the bottom of the hypothalamus – which in turn regulates ovarian activity to promote ovulation. Numerous studies in both mice and humans indicate a negative impact on female reproduction when the circadian rhythm is disrupted. However, the underlying mechanisms are not yet fully understood.

Researchers from the Institute of Cellular and Integrative Neurosciences (INCI) and the University of Strasbourg have previously shown that shift work-like patterns for several weeks lead to a reduced pregnancy rate in female mice. Now, in this study, the researchers mimicked long-term shift work conditions in female mice by constantly shifting the light-dark cycle, delaying and advancing light exposure by 10 hours across four weeks, and found that the massive release of the pituitary hormone called luteinising hormone – which triggers ovulation – was abolished, subsequently reducing fertility in these mice.

"The decreased fertility is due to an alteration of the master circadian clock signalling towards the hypothalamic reproductive circuit," said lead researcher Marine Simonneaux. "Specifically, our research shows that four weeks of chronic shift exposure impairs the transmission of light information from the master biological clock to the kisspeptin neurons, known to drive the timing of the pre-ovulatory luteinising hormone surge."

The next step for research will be to look at whether other additional internal clocks are altered after shift work-like patterns. "The circadian rhythm not only requires proper functioning of the master biological clock, but also a synchronised activity of numerous secondary clocks found in other brain areas and peripheral organs, including reproductive organs," said Ms Simonneaux. "Understanding the precise mechanisms by which circadian disruption alters the reproductive function is important, as it may paye reproductive function is important, as it may pave the way for potential preventive and therapeutic interventions to reduce some of the negative effects of shift work on women's fertility.



Why you should never be ashamed of your mental health needs



Between the demands of life and our personal thoughts and emotions, it can be hard to manage your mental health. You first need to remind yourself that every single person has mental health. We all think inner thoughts. We all have triggers and coping mechanisms. We all process life differently, and it's never a shame to want to improve how you feel about your life or yourself.

In fact, I would argue that it takes a very strong person to even begin to approach their mental health objectively. It shows a high level of self-awareness and reflection. It also displays a desire for growth and productivity in your life. These tend to be signs of intelligence, showing that you are willing to acknowledge that you need help.

Never internalize your mental health needs

It's worse to internalize your problems and not approach the cause of your stress or anxiety. It's worse to allow yourself to suffer when tools, therapists, friends, and family are available to you when you are in need. When you hide these aspe

cts of yourself, you are denying yourself improvement. This can lead to unhealthy coping mechanisms like alcohol or substance abuse. Mental health issues exist regardless of your willingness to confront them.

What ultimately matters is how you go about your mental health. It's your job to take care of yourself and give yourself the best opportunity in life. Sometimes, you need to admit that your mental health could require some extra attention. No weakness exists when you decide you want to improve yourself. When you can confront these issues, you will be able to recover from past trauma or unhealthy ways of coping.

Set an example for others

You deserve the best shot and owe it to yourself to push past mental health stigmas and judgments. When you do this, you are not only helping yourself, but you are setting an example for others in your life as well. You should never feel shame for your needs. Just be proud that you can have the opportunity to understand yourself and your needs better.



THE FIRST AND ONLY FELINE BROAD-SPECTRUM PARASITE PROTECTION THAT KILLS TAPEWORMS













The One You Want for One-And-Done Monthly Parasite Protection

- First-of-its-kind formulation includes esafoxolaner—specifically developed for use in cats
- O Safe for use in kittens as young as 8 weeks, weighing 1.8 lbs or more

Contact your Boehringer Ingelheim Representative to learn more

IMPORTANT SAFETY INFORMATION: NexGard® COMBO (esafoxolaner, eprinomectin, and praziquantel topical solution) is for topical use only in cats. Use with caution in cats with a history of seizures or neurologic disorders. The most frequently reported adverse reactions include vomiting, application site reactions, and anorexia. If ingested, hypersalivation may occur. Avoid direct contact with application site until visibly dry. For more information, see full prescribing information or visit NexGardCOMBOClinic.com.

NexGard* is a registered trademark and NexGard*COMBO* is a trademark of Boehringer Ingelheim Animal Health France, used under license. @2023 Boehringer Ingelheim Animal Health USA Inc., Duluth, GA. All rights reserved. US-PET-0255-2023-A

Boehringer Ingelheim

NexGard COMBO

(esafoxolaner, eprinomectin, and praziguantel topical solution)

For topical use in cats only

CAUTION: Federal law restricts this drug to use by or on the order of a licensed

Description: NexGard® COMBO is a topical solution containing esafoxolanes, eprinomectin Nexasar COMBO; as topical source consuming estructioner, epimoneco and prangiantel available in 0.3 mL and 0.9 mL unit applicators to trust cats from 1.8 lts to 33 lbs. Each mL of NexGard* COMBO contains 12 mg of esafoxolaner, 4 mg of eprinomectin, and 83 mg of praziquantel. Inactive ingredients* dimethyl isosorbide, unstabilized glycerol formal, and butylated hydroxytolaene.

Esafoxolaner is a member of the anyl isoxazoline class of compounds. Its chemical name is 4 [55] 5-{3 chloro-5-(trifluoromethyl);chenyl-5- (trifluoromethyl-4, 5-dihydro-1,2-oxazol-3-yl)-N-{2-oxo-2-(12.2,2-trifluoroethyl) amino)ethyl)-1-naphthamide.

Eprinomectin belongs to the avermectin class of anthelmintics and is a mixture of homologous components referred to as eprinomectin B1a and B1b. The chemical name for eprinomectin B1a is (4°R)-occylamino-5-0-damethyl-4°-decoyavemectin A₁b. the chemical name for eprinomectin B1b is (4°R)-acetylamino-5-0-demethyl-25-de(1-methylpropyl)-4°-decoy-25-(1-methylethyl)

Praziquantel is a pyrazinoisoquinoline anthelmintic. Its chemical name is 24Cyclohexylcarbony(l-1,2,3,6,7,11b-hexahydro-4H-pyrazino(2,1-a)-isoquinolin-4-one.

Indications:

NexGerd® COMBO is indicated for the prevention of heartworm disease caused by Direibias inemits and for the treatment and cortical of roundworm (fourth stage larval and adult Towacara cach, hookworm (fourth stage larval and adult Anaylostoma transilense), and tapeworm [Julypridium canhourd infections, NexGerd® COMBO kills adult flass (Crenocophalotes felis) and is indicated for the treatment and prevention of floa infestations and the treatment and control of bookes scapulares (black-legish tick) and Amblyorama americanum (line start tick) infestations for one month in cats and kitters 8 weeks of age and older, and weighing 1.8 lbs or greater.

Dosage and Administration: NexGard® COMBO is dosed at a minimum of 0.055 mL/lb (0.12 mL/kg), which delivers a minimum dose of (0.55 mg/lb (1.44 mg/kg) esafoxolance, 0.22 mg/lb (0.48 mg/kg) eprinomectin, and 4.53 mg/lb (9.98 mg/kg) praziquantel.

For heartworm disease prevention, apply once monthly for at least three months after last exposure to mosquitoes (see Effectiveness).

Administer the entire contents of a NexGard® COMBO unit applicator topically once a month as specified in the following table:

Dosing Schedule:

Cut Weight (lb)	Volume (mL)	Esafoxolaner (mg)	Eprinomectin (mg)	Praziquantel (mg)	
1.8-5.5 0.3		3.6 1.2		24.9	
5.6-16.5	0.9	10.8	3.6	74.7	
16.6-22	0.3+0.9	14.4	4.8	99.6	
22.1-33	0.9 + 0.9	21.6	7.2	149.4	

A veterinarian or veterinary technician should demonstrate or instruct the pet owner regarding the appropriate technique for applying NexGard* COMBO topically to cats and kittens prior to first use.

Keep product in original packaging until ready to use.



- Use scissors to cut the blister along the dotted line. Then pull the lid away. Remove the applicator from the package and hold it upright. Pull back the
- plunger slightly
- purger signity.

 5. Part the hair on the midline of the nock, between the base of the skull and the shoulder blades until the skin is visible. Place the tip of the applicator on the skin and apply the entire contents directly onto the skin in one spot. The product should be applied to dry skin on an area where the cat cannot lick it off. If the weight of the cat requires a second application, apply the contents in the same manner as described above in the same location.
- 6. Wash hands after use with seep and water

Heartworm Prevention:
For the prevention of heartworm disease, NexGard® COMBO should be administed once a month year-round. At a minimum, administration of NexGard® COMBO should start at least 1 month before the cat's first expected exposure to mosquitoes and monthly thereafter until at least 3 months after the cat's last seasonal exposure to mosquitoes (see Effectiveness). If a dose is missed and a 30-day interval between doses is exceeded, administer NexGard® COMBO immediately and resume the monthly desing schedule. Treatment with fewer than 3 monthly doses may not provide complete heartworm prevention. When replacing another monthly heartworm preventive product in a heartworm prevention program, the first treatment with NexGard® COMBO should be given within one month of the last dose of the former medication. At the discretion of the veterinarian, cats older than 6 months of age may be tested to determine the presence of existing heartworm infection before treatment with NexGard® COMBO. Cats already infected with adult heartworms can be given NexGard® COMBO. Cats already infected with adult heartworms can be given NexGard® COMBO monthly to prevent further infections. prevent further infections

Flea Treatment and Prevention:

Flea Treatment and Prevention: For the treatment and prevention of flea infestations, the use of NaxGard® COMBO may begin at any time of year. NaxGard® COMBO should be administered year-round at menthly intervals or begin at least one month before fleas become active. However, an environmental infestation may persist for a short time after beginning treatment with NexGard® COMBO because of the development of adult fleas from eggs that were laid prior to the initiation of ***Readment**. treatment

Tick Treatment and Control:

Tack Residents and Contest: For the treatment and control of infestations with Joedes scapular's and Amblyomma americanum, the use of NexGad® COMBO may begin at ar-time of year. NexGad® COMBO should be administered year-round at m intervals or begin at least one month before the ticks become active.

at and Control of Roundworms, Hookworms, and Taneworm readment and common of normalwarms, notworms, and represents to NexGadf* COMBO provides treatment and control of nondworms (adult a fourth stage larval Toxocara cart), hookworms (adult and fourth stage larval Ancytostome tubaetomin; adult Ancytostome branifensei), and tageworms Ancytostoma butwateromic adult Ancytostoma pramienses, and approximate (Dipylidium caninum). For the treatment of hookworm, roundworms and tapeworm infections, NexGard® COMBO should be administered once as a single close. Morthly use of NexGard® COMBO will control any subsequent infections. Cast may be exposed to and can become infected with roundworms, hookworms, and tapeworms throughout the year, segardless of season or company.

Contraindications: There are no known contraindications for the use of NexGard® COMBO.

Human Warnings: Not for human use. Keep this and all drugs out of sight and reach of children.

Avoid direct contact with application site for 4 hours or until visibly dry. This product may act as a mild to moderate eye irritant.

Keep product in the original packaging until use. Wash hands after product administration. If the product accidentally gets into the eyes, rise thoroughly with water. If wearing contact lenses, flush the eyes first with water and then remove the lenses and continue to flush thoroughly with water. In case of accidental ingestion, or if skin or eye irritation occurs, contact a poison control center or physician for treatment advice.

Precautions:
Esafosolane, one of the ingredients in NeoGard® COMBO, is a member of the isoxazoline class. This class has been associated with neurologic adverse reactions including tremers, ataxis, and seitures. Seitures have been reported in cats recoking isoxazoline class drugs, over in cats without a history of seitures. Use with caution in cats with a history of seitures or neurologic disorders.

Do not administer orally. Cats may salivate excessively if NexGard® COMBO is accidentally administered orally or is ingested through licking/grooming the application site (see Target Animal Safety).

The safety of NexGard® COMBO has not been tested in breeding, pregnant, or

The safety of NexGard® COMBO has not been tested in kittens less than 8 weeks of age or weighing less than 1.8 lbs (0.8 kg).

Adverse Reactions: In a field safety and effectiveness study, which included a total of 20 in a new serey and energineness study, which included a total of ZUI households and 380 treated cats (244 cats treated with NewGard* COMBO, 136 cats treated with an active control), the safety of NewGard* COMBO was evaluated over a 90-day period through in-clinic physical examinations or through reporting of abnormalities by the owner. The most frequently reported reactions in the NexGard* COMBO and active control groups are presented in the following table.

Adverse Reactions by Treatment Group

	Treatment Group				
EVENT	NexGard COMBO		Active Control		
	n1	% (n=244)	R ²	% (n=136)	
Vomiting	16	6.56	8	5.88	
Application Site Hair Change	9	3.69	0	0.00	
Anorexia	7	2.87	4	2.94	
Lethergy	6	2.46	5	3.68	
Bacterial Skin Infection	4	1.64	1	0.74	
Itching	4	1.64	0	0.00	
Sneezing	4	1.64	5	3.68	
Skin Peeling	3	1.23	2	1.47	
Diarrhea	3	1.23	3	2.21	
Epiphora	3	1.23	1	0.74	
Hypersalivation	3	1.23	0	0.00	
Hyperthermia	3	1.23	0	0.00	
Alopecia	2	0.82	0	0.00	
Dermal Thickening	2	0.82	0	0.00	
Ear Pruritus	2	0.82	1	0.74	
Application Site Redness	2	0.82	0	0.00	
Conjunctivitis	1	0.41	1	0.74	

'Number of cats treated with NexGard® COMBO with the identified abnormality. mber of cats treated with Active Control with the identified abnormality

Contact Information

To report suspected adverse events, for technical assistance or to obtain a copy of the SDS, contact Boehringer Ingelheim Animal Health USA Inc. at 1-888-637-4251 or www.nexgardforpets.com.

For additional information about reporting adverse drug experiences for animal drugs, contact FDA at 1-888-FDA-VETS or online at www.fda.gov/reportanimalae.

The Safety Data Sheet (SDS) provides additional occupational safety information. For customer service or to obtain product information, including the SDS, call 1-888-637-4251.

Clinical Pharmacology

Clinical Pharmacology.

Mode of Action:

Mode of Action:

Saltovolaner is a member of the isoxazeline family, shown to bind at a site to inhibit insect and acarine ligand-gated chloride channels, in particular those gated by the neurotransmitter gamma-aminobutyric acid (GABA), thereby blocking pre- and post-synaptic transfer of chlorade ions across cell membranes. Prolonged esaltovolaner-induced hyperexcitation results in uncontrolled activity of the central nervous system and death of insects and acarines. The selective toxicity of esaftocolaner between insects/acarines and mammals may be inferred by the differential sensitivity of the insects/acarines GABA receptors versus memmalian GABA receptors.

Eprinomectin is an endectocide in the macrocyclic lactone class that binds to glutamate gated chloride channels that are present in invertebrate nerve and muscle cells and increases the permeability of the cell membrane to chloride ions that triggers hyperpolarization of the nerve or muscle cell in susceptible parasites, resulting in paralysis and death of the parasite.

Praziquentel's mode of action is not precisely known, but treated tapeworms undergo muscular paralysis accompanied by a rapid influx of calcium ions and the disruption of the togument.

Pharmacokinetics

Prisomacotenetes:
After a single topical administration to healthy male and female cats of a combined topical formulation containing esafexolaner (12 mg/ml.), eprinomectin (4 mg/ml.), and praziquantel [83 mg/ml.], at dose volumes of 0.05, 0.12, or 0.24 ml./kg, there was a dose proportional increase in the exposure of each ingredient based on maximum plasma concentration (Cmau) and area under the plasma concentration in time curve (LNIC). After repeated monthly doses of the combined topical formulation at the target dose of 1.44 mg/kg esafexolaner, 0.48 mg/kg errinomectin, and 9.98 mg/kg in programatic steady state was reached by the espican romination at the target cools of 1.44 https://gesanoonaner.co.es.mg/kg eprinomectin, and 9.98 mg/kg prasiquantel, steady state was reached by the fourth dose for esafoxolaner and after the second dose for eprinomectin and praziquantel. Additionally, modest accumulation was observed for esafoxolaner (approximately 3-doll) and praziquantel (approximately 1.5- to 2-fold) between the first and fifth dose, whereas no accumulation was observed for eprinomectin.

Effectiveness:

Enectoveness:

In well-controlled laboratory studies, NexGard® COMBO (esafoxolaner, eprinomectin, and praziquantel topical solution) was 100% effective in preventing the development of hearthorns in cats incoulated with infective lange of birofilaria immitis 30 days prior to the first of three consecutive monthly treatments.

Flea Treatment and Prevention: In a well-controlled laboratory study, NevGard® COMBO killed >92% of fleas within 24 hours. During subsequent weekly infections, NevGard® COMBO killed >95% of fleas within 24 hours through Day 31 and killed fleas before they could lay eggs. The effectiveness against adult fleas at 24 hours post-infestation in the treated cats virtually elemented flea egg production 193.8—100% control of flea egg production by 24 hours) throughout the remainder of the month.

In a field safety and effectiveness study in the United States, conducted in households with existing flea infestations, the effectiveness of NexGerth COMBO against fleas was 97.8%, 98.6%, and 99.9% when assessed on Days 30, 60, and 90, respectively. Cats with signs of flea allergy dematitis showed improvement in allopecia, dematitis/pyodermatitis, pruntus, erythema, papules, and scaling, as a direct result of eliminating fleas.

Tick Treatment and Control:

In well-controlled laboratory studies, NexGard® COMBO demonstrated ≥95.1% effectiveness against Ixodes acapularis 48 hours post-infestation for a month and 295.6% effectiveness against Amblyomma americanum 72 hours postinfestation for a month

Treatment and Control of Roundworms, Hookworms, and Tapeworms: In 2 well-controlled laboratory studies, NexSard® COMBO provided 99.9% and 100% effectiveness against natural and/or induced roundworm infections with the dose-limiting gastrointestrial nematod aspecies (adult Toroccara cati), respectively. Effectiveness studies against fourth stage lenel Toroccara cati and hookworms (adult and fourth stage lanel Ancylostoma rubaeforms; adult Ancylostoma hazilienest were conducted with an early formulation. The disease of enricements in in this early formulation are equivalent to that of the doses of opiniomectin in this early formulation are equivalent to that of the final formulation of NasGard* COMRID. In well-controlled laboratory studies, NasGard* COMRID provided on average S2.8% effectiveness against natural and/or induced infections with Dipylidium cavinum.

Target Animal Safety:

Target Animal Safety:
Margin of Safety Study:
Margin of Safety Safety

Study in Heartworm Positive Cats: Adult cats, 4.7 to 6.6 months of age, were experimentally infected with adult Adult cats, 4.7 to 6.6 months of age, were experimentally infected with adult heartworms (D. immitis) by venous transplantation. All cats were negative for heartworm antibody, antigen and microf larise prior to transplantation. Two weeks after transplantation, immunosecology verified positive antigen and the presence of microfilarise in all enrolled cats. A combination of fignorii, epriormedin, praziquantel, and (S)-methopene was applied topically to cats at 1X or 3X the maximum exposure dose once every 28 days for three consecutive treatments; cats in the control group were dosed with mineral oil. One cat in the 1X group exhibited cyanotic microus membranes and tachypnes for 24 hours following the first treatment. The cat received and echibited no abnormal signs following two subsequent treatments. There was no difference between the treatment groups in the number of adult D. immitis recovered at the end of the study.

Oral Administration Study:
Oral Interaction Study:
Oral Interaction was evaluated to assess the effects of accidental oral ingestion.
Kittens Insale and female) ranging in age from 7.4 to 8.9 weeks were orally
administrated NexGard** OOMBO at 1X femalianism exposure does; kittens
in the control group were dosed with saline. Cats were observed for adverse
nections at 1, 2, 3.4, and 8 hours following administration, then twice a
day until Day 14. All 8 cats administered NexGard** COMBO immediately
eshibited excessive hypersalivation after oral administration. However, all cats
stopped salivating within 1 hour after exposure. No additional health related
observations were seen for the remainder of the study.

How Supplied:

NesGard® COMBO is packaged as a single dose in 0.3 mL (for cats 1.8-5.5 lb) and 0.9 mL (for cats 5.6-16.5 lb) applicators. Each size applicator is available in cartons containing 1, 3, or 6 applications.

Storage Information: Store at $59^\circ-86^\circ$ F ($15^\circ-30^\circ$ C). Brief periods up to 104° F (40° C) are permitted. Protect from light.

Approved by FDA under NADA # 141-570

Marketed by: Boehringer Ingelheim Animal Health USA Inc., Duluth, GA 30096

NexGard* is a registered trademark and NexGard COMBO™ is a trademark of Boehringer Ingetheim Animal Health France, used under license.

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BALANCING PARENTHOOD AND A DEMANDING PROFESSION



2. PREVAIENCE OF PARENTAL GUILT:

Parental guilt is a common emotional burden experienced by health care professionals. Research reveals that a significant number of physicians and nurses report feeling guilty about not spending enough time with their children due to work commitments (2). This guilt can be amplified by societal expectations and the desire to be fully present in both their professional and parenting roles. Addressing parental guilt requires acknowledging its prevalence and implementing strategies to alleviate its impact.

3. NEED FOR FAMILY-FRIENDLY POLICIES:

Family-friendly policies play a crucial role in supporting health care professionals who are parents. Unfortunately, many health care settings lack comprehensive policies that accommodate the unique needs of working parents. According to data, only a fraction of health care organizations provide parental leave, lactation support, flexible scheduling options, and on-site childcare facilities (3). Implementing family-friendly policies is not only beneficial to employees but also contributes to better retention rates and employee satisfaction.

4. SUPPORT NETWORKS AND PEER MENTORING:

The presence of strong support networks and peer mentoring can significantly impact the experiences of health care professionals who are parents. Establishing networks among colleagues who share similar challenges allows for the exchange of advice, emotional support, and the opportunity to navigate the intricacies of balancing parenthood and a demanding profession. Research indicates that peer mentoring programs can positively affect job satisfaction and work-life balance among health care professionals (4).

5. EFFECTS ON CAREER ADVANCEMENT:

Parenthood can sometimes pose challenges to career advancement in the health care field. Statistics show that women, in particular, face barriers such as gender bias, limited opportuni-ties for part-time or flexible positions, and reduced access to leadership roles after becoming parents (5). Balancing professional aspirations with the responsibilities of raising a family necessitates creating an inclusive environment that supports career progression for health care professionals who are parents.

6. IMPORTANCE OF SELF-CARE AND

Maintaining personal well-being is vital for health care professionals who are parents. Juggling the demands of work and family can result in increased stress, burnout, and compromised physical and mental health. It is crucial for health care organizations to promote self-care initiatives, provide resources for stress management, and encourage a healthy work-life integration. Prioritizing self-care enables health care professionals to better serve their patients and be present for their

Health care professionals who are parents face unique challenges in achieving a harmonious balance between their careers and family responsibilities. Acknowledging these challenges and implementing supportive policies, fostering a culture of peer mentoring, addressing parental guilt, and prioritizing self-care are essential steps towards creating an inclusive environment that enables health care professionals to thrive both professionally and as parents. By nurturing the well-being of health care professionals who are parents, we can ensure a sustainable and fulfilling future for both them and their patients.

GENE THERAPY

produces long-term contraception in female domestic cats

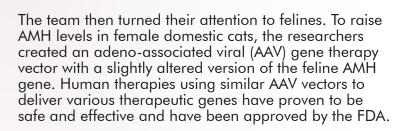
Currently there are no contraceptives capable of producing permanent sterilization in companion animals. Spaying, the surgical removal of the ovaries and uterus, is the most widely used strategy to control unwanted reproduction in female cats.

For the first time, researchers at Massachusetts General Hospital (MGH), a founding member of Mass General Brigham (MGB), and their collaborators have demonstrated that a single dose of anti-Müllerian hormone (AMH) gene therapy can induce long-term contraception in the domestic cat, potentially providing a safe and effective alternative to surgical spaying. The research is published in the latest issue of Nature Communications.

During previous research to evaluate AMH (also known as Müllerian inhibiting substance, or MIS) as a method to protect ovarian reserve in women undergoing chemotherapy, senior author David Pépin, PhD, Associate Director of the Pediatric Surgical Research Laboratories at Massachusetts General Hospital, and an Associate Professor at Harvard Medical School discovered that raising the level of AMH beyond a certain threshold suppressed the growth of ovarian follicles, effectively preventing ovulation and conception.

"AMH is a naturally occurring non-steroidal hormone produced by the ovaries in human females and other mammals, and in the testes in males." says Patricia K. Donahoe, MD, a co-author of this study and the Director of Pediatric Surgical Research Laboratories and Chief Emerita of Pediatric Surgical Services at Massachusetts General Hospital.

In 2017, Pépin and his collaborators were the first to publish the contraceptive potential of AMH in rodents.



"A single injection of the gene therapy vector causes the cat's muscles to produce AMH, which is normally only produced in the ovaries, and raises the overall level of AMH about 100 times higher than normal," says Pépin.

The researchers treated six female cats with the gene therapy at two different doses, and three cats served as controls. A male cat was brought into the female colony for two four-month-long mating trials. The researchers followed the female cats for more than two years, assessing the effect of the treatment on reproductive hormones, ovarian cycles, and fertility.

All the control cats produced kittens, but none of the cats treated with the gene therapy got pregnant. Suppressing ovarian follicle development and ovulation did not affect important hormones such as estrogen. There were no adverse effects observed in any of the treated female cats, demonstrating that at the doses tested, the gene therapy was safe and well tolerated.

"The treatment maintained high AMH levels for over two years, and we're confident that those contraceptive levels will be sustained in the animals for much longer," says veterinarian Philippe Godin, DVM, PhD, co-author and research fellow at MGH. Additional studies in a larger number of cats are needed to confirm these promising findings, he adds.

The collaborative research team, which includes investigators from MGH, the Center for Conservation and Research of Endangered Wildlife at the Cincinnati Zoo and Botanical Garden, and at the Horae Gene Therapy Center at the University of Massachusetts Medical School, received funding from The Michelson Found Animals Foundation, which is offering a \$25-million prize to scientists to develop a single-treatment nonsurgical sterilization method for cats and dogs. The foundation also provides grant funding to support research that could lead to a practical solution that meets all the prize criteria.

"A non-surgical sterilant for community and companion animals is long overdue and will transform animal welfare," said Gary K. Michelson, MD, founder and co-chair of Michelson Philanthropies and the Michelson Found Animals Foundation. "This breakthrough discovery is a major milestone in our quest to provide pet owners with an alternative to surgical spay and neuter."

"This technology may be a little ahead of its time," acknowledges Pépin, noting that the infrastructure needed to produce enough doses to sterilize millions of cats via gene therapy does not yet exist. "Our goal is to show that safe and effective permanent contraception in companion animals can be achieved using gene therapy. And we hope that as the manufacturing capability of producing viral vectors increases with the rise of gene therapy in humans, delivering this contraceptive in the field to control unowned outdoor cat populations will become feasible."



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