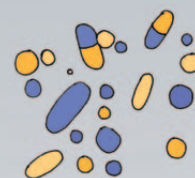


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Rise and shake with
Dr. Mike Petty

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Rise and shake: Canine pain indicators

At last month's Fetch dvm360 conference, Michael Petty, DVM, CVPP, CVMA, CCRT, CAAPM, shared a pair of tips about visually identifying presentation of pain in pooches. As dvm360 Medicine Channel Director Mindy Valcarcel and dvm360 News Channel Director Kristi Fender report, Dr. Petty said there's much that can be learned simply from observing how a dog gets up and gets moving.

For starters, watch how the dog transitions into a standing position. Does the patient come up on its front feet first? If so, this can indicate pain, possibly hip dysplasia—because pain-free dogs tend to rise from their back legs first.

Another motion to analyze is when, after rising, a dog gives itself a good shake from head to tail. If that shaking stops at a certain place along the body, this may point to pain at that location. Check out the video at dvm360.com/riseandshake for more. (And don't miss more great tips from Dr. Petty on page 28!)

Pet pain management at Fetch

Don't miss Dr. Petty's brilliant lectures on managing both acute and chronic pain at Fetch dvm360 conference in Kansas City August 17-20. Go to fetchdvm360.com/kc to learn more and to register.



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New and updated treatments are now available or on the horizon to treat seizures—those coughs of the brain—in your patients.



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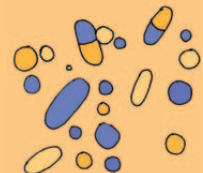


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Is climate change affecting parasite prevalence?

By Katie James

Talk about climate change has been ever-increasing over the last few years, and there's evidence of the consequences that it'll have on the weather and other natural phenomena. But what about prevalence for disease-carrying parasites that affect pets and people? Here, Fetch dvm360 speaker Richard Gerhold, DVM, MS, PhD, runs through a few parasites that could already be affected by these changes.

Dirofilaria immitis (heartworm)

A warming environment can lead to an increase in larval stage development in mosquitoes, potentially influencing the expansion of heartworm disease incidence. Other factors include an increase in mosquito populations in cooler months and certain mosquito species that are able to inhabit northern or higher-altitude regions that weren't previously occupied by vector-carrying species, Dr. Gerhold says. Another factor that's contributing to the spread of heartworm disease is urbanization. More areas of standing water, such as flower pots, old tires and buckets, provide space for mosquitoes to breed. Similar trends of increasing infection are expected for humans and domestic and wild animals, which has already been observed in certain northern states in the United States, Dr. Gerhold notes.

Toxoplasmosis

In the environment, sporulation of *Toxoplasma gondii* occurs between one to five days, and under favorable conditions sporocysts can survive about 18 months in fresh or salt water, Dr. Gerhold says. Sporulation can happen faster in warmer environments, leading to a more rapid production of oocysts in the environment.

Coccidia

Like *Toxoplasma gondii*, sporulation with *Coccidia* happens in one to five days, and under favorable conditions, oocysts can survive for about 18 months. This sporulation can happen faster in warmer climates, leading to more oocysts in the environment. Higher oocyst production and ingestion leads to greater pathology because of parasite replication within the host cells, Dr. Gerhold says.

Ancylostoma species (hookworm)

The increase in air and soil temperatures will likely lead to increased numbers of infective L3 larva in the environment, Dr. Gerhold says. This has been seen with a higher incidence of human cutaneous larval migrans due to both canine and feline hookworm species during abnormally warm periods in various regions.

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INDICATIONS

Control of pruritus associated with allergic dermatitis and control of atopic dermatitis in dogs at least 12 months of age.

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(oclacitinib tablet)

IMPORTANT SAFETY INFORMATION

Do not use APOQUEL in dogs less than 12 months of age or those with serious infections. APOQUEL may increase the chances of developing serious infections, and may cause existing parasitic skin infestations or pre-existing cancers to get worse. APOQUEL has not been tested in dogs receiving some medications including some commonly used to treat skin conditions such as corticosteroids and cyclosporine. Do not use in breeding, pregnant, or lactating dogs. Most common side effects are vomiting and diarrhea. APOQUEL has been used safely with many common medications including parasiticides, antibiotics and vaccines.

For more information, please see Brief Summary of full Prescribing Information on adjacent page.

References: 1. Gadeyne C, Little P, King VL, et al. Efficacy of oclacitinib (Apoquel®) compared with prednisolone for the control of pruritus and clinical signs associated with allergic dermatitis in client-owned dogs in Australia. *Vet Dermatol.* 2014;25(6):512-518. doi:10.1111/vde.12166. 2. Cosgrove SB, Wren JA, Cleaver DM, et al. Efficacy and safety of oclacitinib for the control of pruritus and associated skin lesions in dogs with canine allergic dermatitis. *Vet Dermatol.* 2013;24(5):479-e114. doi:10.1111/vde.12047. 3. Aleo MM, Galvan EA, Fleck JT, et al. Effects of oclacitinib and prednisolone on skin test sensitivity [abstract]. *Vet Dermatol.* 2013;24(3):297.

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apoquel®

(oclacitinib tablet)

3.6 mg

5.4 mg

16 mg

Brief Summary of Prescribing Information

For oral use in dogs only

Caution: Federal (USA) Law restricts this drug to use by or on the order of a licensed veterinarian.

Indications: Control of pruritus associated with allergic dermatitis and control of atopic dermatitis in dogs at least 12 months of age.

Dosage and Administration: The dose of APOQUEL (oclacitinib maleate) tablets is 0.18 to 0.27 mg oclacitinib/lb (0.4 to 0.6 mg oclacitinib/kg) body weight, administered orally, twice daily for up to 14 days, and then administered once daily for maintenance therapy. APOQUEL may be administered with or without food.

Dosing Chart

Weight Range (in lb)		Weight Range (in Kg)		Number of Tablets to be Administered		
Low	High	Low	High	3.6 mg Tablets	5.4 mg Tablets	16 mg Tablets
6.6	9.9	3.0	4.4	0.5	-	-
10.0	14.9	4.5	5.9	-	0.5	-
15.0	19.9	6.0	8.9	1	-	-
20.0	29.9	9.0	13.4	-	1	-
30.0	44.9	13.5	19.9	-	-	0.5
45.0	59.9	20.0	26.9	-	2	-
60.0	89.9	27.0	39.9	-	-	1
90.0	129.9	40.0	54.9	-	-	1.5
130.0	175.9	55.0	80.0	-	-	2

Warnings:

APOQUEL is not for use in dogs less than 12 months of age (see **Animal Safety**).

APOQUEL is not for use in dogs with serious infections.

APOQUEL may increase susceptibility to infection, including demodicosis, and exacerbate neoplastic conditions (see **Adverse Reactions** and **Animal Safety**).

Human Warnings:

This product is not for human use. Keep this and all drugs out of reach of children. For use in dogs only. Wash hands immediately after handling the tablets. In case of accidental eye contact, flush immediately with water or saline for at least 15 minutes and then seek medical attention. In case of accidental ingestion, seek medical attention immediately.

Precautions:

APOQUEL is not for use in breeding dogs, or pregnant or lactating bitches.

The use of APOQUEL has not been evaluated in combination with glucocorticoids, cyclosporine, or other systemic immunosuppressive agents.

Dogs receiving APOQUEL should be monitored for the development of infections, including demodicosis, and neoplasia.

Adverse Reactions:

Control of Atopic Dermatitis

In a masked field study to assess the effectiveness and safety of oclacitinib for the control of atopic dermatitis in dogs, 152 dogs treated with APOQUEL and 147 dogs treated with placebo (vehicle control) were evaluated for safety. The majority of dogs in the placebo group withdrew from the 112-day study by Day 16. Adverse reactions reported (and percent of dogs affected) during Days 0-16 included diarrhea (4.6% APOQUEL, 3.4% placebo), vomiting (3.9% APOQUEL, 4.1% placebo), anorexia (2.6% APOQUEL, 0% placebo), new cutaneous or subcutaneous lump (2.6% APOQUEL, 2.7% placebo), and lethargy (2.0% APOQUEL, 1.4% placebo). In most cases, diarrhea, vomiting, anorexia, and lethargy spontaneously resolved with continued dosing. Dogs on APOQUEL had decreased leukocytes (neutrophil, eosinophil, and monocyte counts) and serum globulin, and increased cholesterol and lipase compared to the placebo group but group means remained within the normal range. Mean lymphocyte counts were transiently increased at Day 14 in the APOQUEL group.

Dogs that withdrew from the masked field study could enter an unmasked study where all dogs received APOQUEL. Between the masked and unmasked study, 283 dogs received at least one dose of APOQUEL. Of these 283 dogs, two dogs were withdrawn from study due to suspected treatment-related adverse reactions: one dog that had an intense flare-up of dermatitis and severe secondary pyoderma after 19 days of APOQUEL administration, and one dog that developed generalized demodicosis after 28 days of APOQUEL administration. Two other dogs on APOQUEL were withdrawn from study due to suspected or confirmed malignant neoplasia and subsequently euthanized, including one dog that developed signs associated with a heart base mass after 21 days of APOQUEL administration, and one dog that developed a Grade III mast cell tumor after 60 days of APOQUEL administration. One of the 147 dogs in the placebo group developed a Grade I mast cell tumor and was withdrawn from the masked study. Additional dogs receiving APOQUEL were hospitalized for diagnosis and treatment of pneumonia (one dog), transient bloody vomiting and stool (one dog), and cystitis with urolithiasis (one dog).

In the 283 dogs that received APOQUEL, the following additional clinical signs were reported after beginning APOQUEL (percentage of dogs with at least one report of the clinical sign as a non-pre-existing finding): pyoderma (12.0%), non-specified dermal lumps (12.0%), otitis (9.9%), vomiting (9.2%), diarrhea (6.0%), histiocytoma (3.9%), cystitis (3.5%), anorexia (3.2%), lethargy (2.8%), yeast skin infections (2.5%), pododermatitis (2.5%), lipoma (2.1%), polydipsia (1.4%), lymphadenopathy (1.1%), nausea (1.1%), increased appetite (1.1%), aggression (1.1%), and weight loss (0.7).

Control of Pruritus Associated with Allergic Dermatitis

In a masked field study to assess the effectiveness and safety of oclacitinib for the control of pruritus associated with allergic dermatitis in dogs, 216 dogs treated with APOQUEL and 220 dogs treated with placebo (vehicle control) were evaluated for safety. During the 30-day study, there were no fatalities and no adverse reactions requiring hospital care. Adverse reactions reported (and percent of dogs affected) during Days 0-7 included diarrhea (2.3% APOQUEL, 0.9% placebo), vomiting (2.3% APOQUEL, 1.8% placebo), lethargy (1.8% APOQUEL, 1.4% placebo), anorexia (1.4% APOQUEL, 0% placebo), and polydipsia (1.4% APOQUEL, 0% placebo). In most of these cases, signs spontaneously resolved with continued dosing. Five APOQUEL group dogs were withdrawn from study because of: darkening areas of skin and fur (1 dog); diarrhea (1 dog); fever, lethargy and cystitis (1 dog); an inflamed footpad and vomiting (1 dog); and diarrhea, vomiting, and lethargy (1 dog). Dogs in the APOQUEL group had a slight decrease in mean white blood cell counts (neutrophil, eosinophil, and monocyte counts) that remained within the normal reference range. Mean lymphocyte count for dogs in the APOQUEL group increased at Day 7, but returned to pretreatment levels by study end without a break in APOQUEL administration. Serum cholesterol increased in 25% of APOQUEL group dogs, but mean cholesterol remained within the reference range.

Continuation Field Study

After completing APOQUEL field studies, 239 dogs enrolled in an unmasked (no placebo control), continuation therapy study receiving APOQUEL for an unrestricted period of time. Mean time on this study was 372 days (range 1 to 610 days). Of these 239 dogs, one dog developed demodicosis following 273 days of APOQUEL administration. One dog developed dermal pigmented viral plaques following 266 days of APOQUEL administration. One dog developed a moderately severe bronchopneumonia after 272 days of APOQUEL administration; this infection resolved with antimicrobial treatment and temporary discontinuation of APOQUEL. One dog was euthanized after developing abdominal ascites and pleural effusion of unknown etiology after 450 days of APOQUEL administration. Six dogs were euthanized because of suspected malignant neoplasms: including thoracic metastatic, abdominal metastatic, splenic, frontal sinus, and intracranial neoplasms, and transitional cell carcinoma after 17, 120, 175, 49, 141, and 286 days of APOQUEL administration, respectively. Two dogs each developed a Grade II mast cell tumor after 52 and 91 days of APOQUEL administration, respectively. One dog developed low grade B-cell lymphoma after 392 days of APOQUEL administration. Two dogs each developed an apocrine gland adenocarcinoma (one dermal, one anal sac) after approximately 210 and 320 days of APOQUEL administration, respectively. One dog developed a low grade oral spindle cell sarcoma after 320 days of APOQUEL administration.

To report suspected adverse events, for technical assistance or to obtain a copy of the MSDS, contact Zoetis Inc. at 1-888-963-8471 or www.zoetis.com.

For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at <http://www.fda.gov/AnimalVeterinary/SafetyHealth>.

Storage Conditions:

APOQUEL should be stored at controlled room temperature between 20° to 25°C (68° to 77°F) with excursions between 15° to 40°C (59° to 104°F).

How Supplied:

APOQUEL tablets contain 3.6 mg, 5.4 mg, or 16 mg of oclacitinib as oclacitinib maleate per tablet. Each strength tablets are packaged in 20 and 100 count bottles. Each tablet is scored and marked with AQ and either an S, M, or L that correspond to the different tablet strengths on both sides.

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February 2013

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Fast feline-friendly fixes

Finding feline-friendly facilities often requires careful consideration from concerned clients. Progressive practices practice patient, positive, purrfect care for all sorts of fine felines: finicky, flighty, ferocious, fearful and feisty. However, many positive, progressive practices feel that being feline-friendly costs copious quantities of cold currency to create construction, which causes chaos instead of courting cats. So how can you make fixes for felines without purloining your pocketbook? Here are some ideas courtesy of Michael Nappier, DVM, DABVP, assistant professor of community practice in the Department of Small Animal Clinical Sciences at the Virginia-Maryland College of Veterinary Medicine.



Show your clients how much you love cats and love your practice. Get rid of the dirty old cat gloves and fish nets. Instead, get some big fluffy towels. The most versatile of restraint devices, they leave your dexterity intact and can go from cuddle to cat capture in the blink of an eye.



What about your treat jars—all dog cookies? Try something creative! Catnip is easy to grow inside, and your patients and clients will go wild for it.



Don't have space or need for a full-time cat ward? Flexible, dividable kennel spaces and simple curtains can create part-time cat spaces.

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INDICATIONS

Trifexis is indicated for the prevention of heartworm disease (*Dirofilaria immitis*). Trifexis kills fleas and is indicated for the prevention and treatment of flea infestations (*Ctenocephalides felis*), and the treatment and control of adult hookworm (*Ancylostoma caninum*), adult roundworm (*Toxocara canis* and *Toxascaris leonina*) and adult whipworm (*Trichuris vulpis*) infections in dogs and puppies 8 weeks of age or older and 5 pounds of body weight or greater.

IMPORTANT SAFETY INFORMATION

Serious adverse reactions have been reported following concomitant extra-label use of ivermectin with spinosad alone, one of the components of Trifexis. Treatment with fewer than three monthly doses after the last exposure to mosquitoes may not provide complete heartworm prevention. Prior to administration of Trifexis, dogs should be tested for existing heartworm infection. Use with caution in breeding females. The safe use of Trifexis in breeding males has not been evaluated. Use with caution in dogs with pre-existing epilepsy. The most common adverse reactions reported are vomiting, lethargy, pruritus, anorexia and diarrhea. To ensure heartworm prevention, dogs should be observed for one hour after administration. If vomiting occurs within one hour, redose. Puppies less than 14 weeks of age may experience a higher rate of vomiting. For product information, including complete safety information, see page 08.



Ready to step in?

Who knows what's ahead of you when a veterinary emergency is waiting for you? Dr. Garret Pachtinger is on call with tips to have in your back pocket and help you save the day. *By Mindy Valcarcel*

The scary door—the stuff of nightmares for pet owners and veterinarians alike. When an emergency arises, clients rush their pets to your veterinary clinic, passing over your threshold in the hopes that you can save their beloved pet. And veterinarians can't be sure what exactly they're going to face as they pass through the exam

room door where a pet in the midst of a life-threatening situation waits for intervention.

At a recent Fetch dvm360 conference, VETgirl cofounder Garret Pachtinger, VMD, DACVECC, delivered critical tips on emergency care to a packed audience in what he admits is his favorite session. Here are a few highlights.

CPR

Go with "Stayin' Alive," not "I Will Survive." Did the Bee Gees know their song would become the go-to reference for the right tempo at which to perform chest compressions in CPR? Gee, who knows? But if you mentally summon this '70s classic and perform chest compressions to the beat, it's about

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Garret Pachtinger, VMD, DACVECC

100 to 120 beats/min, which is what to aim for to give patients a helping hand toward stayin' alive, stayin' alive, says Dr. Pachtinger.

Don't lean in. Dr. Pachtinger says that for chest compressions to work, the chest must recoil after compression. "You need negative pressure to pull the blood back into the chest cavity," he says. So don't lean on the patient, and he says that you should compress about one-third of the anterior-posterior chest diameter.

Delineate a line of succession. Dr. Pachtinger says studies have shown that the longer you do chest compressions, the more ineffective they become. He recommends that you switch out who is doing the compressions at least every two minutes.

Watch the capnograph. A Fetch dvm360 conference attendee asked when you know it's OK to stop performing CPR. Dr. Pachtinger says that, ideally, you'll have an end-tidal carbon dioxide reading. "It's one of the first ways you'll know they're coming back to life," he says.

Intraosseous catheters

You've got a neonate that's hypovolemic, hypothermic and hypotensive. Think you're going to be able to get an intravenous catheter in there? Instead, turn to an intraosseous (IO) one, says Dr. Pachtinger. Most drugs that can be given intravenously can be given intraosseously. A little uncertain with the thought of this procedure? You're not alone. Several vets in the audience expressed discomfort. But it's a lifesaver! Here are Dr. Pachtinger's tips:

- Get a 22-ga, 1-in needle and aim for the femur—"the little divot between those trochanter ridges," he says. Use a twisting motion and it should slip right in.
- Flush in sterile saline solution with a 1-ml syringe.
- At this point, one of three things will happen:
 1. Voilà! It's in. Ready for dosing.
 2. As you start flushing, the leg swells. Dr. Pachtinger says the femur in neonates is cartilaginous—not fully calcified, which is why you are able to easily place the IO catheter in (as compared to an adult patient). You probably went in one cortice and out the other. Take it out and try again," he says. "No big deal—it happens."
 3. You try to flush but get resistance. "The core of the bone is probably sitting in your needle," says Dr. Pachtinger. Take it out and try again.



Should CPR protocol mirror that for humans?

When Dr. Pachtinger recently led this session at Fetch dvm360 conference, a member of the audience pointed out that in CPR in people there is a new emphasis on hands-only CPR, skipping the respiration. But Dr. Pachtinger says that in human patients, the most common reason for cardiac arrest is an arrhythmia called ventricular fibrillation, when rapid, erratic electrical impulses cause your ventricles to quiver uselessly instead of pumping blood. Not so in most veterinary patients, where we see a variety of causes for cardiac arrest, including anesthetic issues, airway obstruction, systemic organ failure or disease and asystole. But he does say there is a movement toward performing chest compressions first in veterinary patients: "We should not delay chest compressions for any reason."



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Indication: CYTOPOINT aids in the reduction of clinical signs associated with atopic dermatitis in dogs.

^{*}Repeat administration every 4 to 8 weeks as needed in individual patients.

References: 1. Data on file, Study Report No. C863R-US-12-018, Zoetis Inc. 2. Gonzales AJ, Humphrey WR, Messamore JE, et al. Interleukin-31: its role in canine pruritus and naturally occurring canine atopic dermatitis. *Vet Dermatol*. 2013;24(1):48-53. doi:10.1111/j.1365-3164.2012.01098.x. 3. Data on file, Study Report No. C362N-US-13-042, Zoetis Inc. 4. Data on file, Study Report No. C961R-US-13-051, Zoetis Inc.

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ZOETIS PETCARE

CYTOPOINT

Dr. Pachtinger says he likes to replace the IO catheter within two hours since it's not comfortable for the patient and by then the patient should be normothermic, normotensive and normoglycemic.

Thoracocentesis

Dr. Pachtinger gets on a soapbox for this one: "If you feel like there's pleural space disease—whether you're talking about something like a pneumothorax or pleural effusion—you should diagnose that with thoracocentesis, not radiographs." And the likelihood of doing damage is very small. Hear all about it in this audio clip in which he starts with one of his favorite quotes from the book *The House of God* by Samuel Shem, MD, a novelized account of a group of medical interns.



Scan the
code to listen
to the clip.

No need for fancy tools here, says Dr. Pachtinger—just a 22-ga needle attached to a 3-ml syringe. "I will try to remove air or fluid if there, for treatment and diagnosis—maybe with sedation," says Dr. Pachtinger. "I like butorphanol with diazepam."

Gastric lavage

When does Dr. Pachtinger most

commonly opt for this lifesaving measure? Food bloat? Nope. It's poisoning! Not in all cases, of course. He says if there is a good antidote, like vitamin K for anticoagulant rodenticide exposure, go for the antidote. But for cases in which emesis is not effective enough and life-threatening illness is right around the corner (e.g. pets that get into lots of bromethaline, cholecalciferol, lilies, baclofen) try gastric lavage.

"I do strongly recommend that if you're going to orogastrically intubate, that the patient is intubated for two reasons," Dr. Pachtinger says. "One is if you've intubated them, there's only one other hole for the tube to go down. You can't accidentally go down to the lungs." The second reason—you protect the airway.

Why not gastric lavage for food bloat? You end up hydrating food sitting in the stomach, creating "big, fluffy kibble that doesn't want to come down the tube," says Dr. Pachtinger. "You aspirate and all the food is still left in the stomach." Better bets for food bloat—fluids, metoclopramide, buprenorphine and regular walks, he says.

These are but a few of the pointers passed on to the Fetch dvm360 conference audience, but we hope they make you feel a bit more equipped to face the scary door of ER care.



If you refer after that life-saving moment: Papers before patients, people

If a patient's transferred or referred to or from the ER/specialty hospital, it's imperative that all the appropriate documentation (lab results, discharge details and diagnosis paperwork) arrives before the patient. Nothing's more frustrating to the clinician (or client) when they show up and the appropriate paperwork hasn't been sent. A patient arrives for "recheck evaluation and bloodwork," and without the appropriate documentation, the clinician may find it difficult to appropriately evaluate and care for that patient. This can delay treatment and lead to a frustrating interaction. Also, emails, text messages and videos can help clients better understand their plan of care at both hospitals, and communication between hospitals improves.

—Garret Pachtinger, VMD, DACVECC

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coughs of the brain

"Are the days of 'Give two phenobarbital tablets and call me in the morning' over?" Fred Wininger, VMD, MS, DACVIM, asked the audience at one of his popular neurology sessions at a Fetch dvm360 conference. His answer: Not quite yet. What new or updated treatment protocols, formulations, food or drugs are now available or on the horizon to treat seizures—those coughs of the brain—in your patients? *By Jennifer Gaumnitz*

When it comes to managing seizures, veterinarians still rely on phenobarbital and potassium bromide in the majority of maintenance regimens for these dogs. But managing seizure disorders is a challenge, especially when a dog does not respond to standard phenobarbital or bromide therapy. According to Dr. Wininger, refractory cases account for 25% to 30% of all epileptics.

So what can veterinarians offer these patients? Better diagnostics and, more important, effective, safer anticonvulsants and easier-to-follow drug regimens.

A diagnosis of idiopathic epilepsy

According to Dr. Wininger, seizure disorders are common in dogs, affecting an estimated 1% of the pet dog population. Seizures are generally classified as structural, metabolic or idiopathic/heritable. Idiopathic epilepsy is by far the most common cause.

Age at the onset of seizures is an important piece of information in the patient history. Idiopathic epilepsy is usually seen in dogs between the ages of 1 and 6 years. "If you have a dog having seizures between the ages of 1 and 6, 80% of the time it's going to be idiopathic epilepsy," Dr. Wininger says. "If the dog is younger than 1 or older than 6, there's a 20% chance of it being idiopathic epilepsy."

Unlike what you may have learned in veterinary school, Dr. Wininger says that it is now known that dogs with idiopathic epilepsy can have violent, frequent

seizures. Also, their seizures do not have to be generalized—they can be focal and asymmetric.

Dr. Wininger says that, when talking to his clients, "I describe seizures as 'the cough of the brain.' They're just a clinical sign; they're not a disease. We want to get at the underlying cause." If it's a dog that's 1 to 6 years old, it's likely idiopathic epilepsy, and there's no need to pursue other causes. However, he says, "If the dog is an outlier, we want to pick up on the cause of that 'cough'—that seizure."

The goals of therapy

With these cases, it's important to manage the expectations of pet owners. Dr. Wininger says when he talks to clients about choosing an anticonvulsant, he tells them that the goal of anticonvulsants is not to stop the seizures completely, but rather to suppress the frequency and severity of the seizures and minimize the postictal effects. Most epileptic dogs will never attain a seizure-free status. Instead, success should be considered as a reduction in the frequency and duration of the seizures. Dr. Wininger says that, of course, other goals are to limit unacceptable and serious side effects, minimize the client's financial burden, and boost the client's compliance with the treatment recommendations.

The client needs to understand that with anticonvulsant drugs, the ideal is to keep the drug in the therapeutic range, avoiding subtherapeutic and toxic ranges. "They need to know that the way to

stay in that range is to give the dog the drug at a dose and frequency that enables the pet to keep the drug in its bloodstream at a steady state, so that they're not dipping or peaking outside of that range," says Dr. Wininger.

When does Dr. Wininger initiate therapy after a dog's first seizure? "I will usually wait until after the second or third seizure to initiate therapy," he says. "If the seizures are more than six months apart, I will usually wait then too. The goal in treating idiopathic epilepsy is one seizure no more than every three months. If you're already there without anticonvulsants, anticonvulsants may not get you much better." He says that most neurologists concur with waiting until animals are having a seizure more frequently than every three months. Exceptions to this are if the dog's first seizure was a status epilepticus event or if the dog is an at-risk breed (like a border collie or Australian shepherd). "I don't wait on those dogs," Dr. Wininger says.

"I'll be more aggressive."

Dr. Wininger says the client's being unable to handle the pet having seizures can influence treatment decisions as well: "With initial anticonvulsant therapy, we're always shooting for monotherapy, but we have to recognize that some dogs just aren't going to be managed with a single drug."

Utilizing levetiracetam

As mentioned, the tried-and-true anticonvulsant drugs remain phenobarbital and, after that, potassium bromide. But what else is available?

Dr. Wininger says that the main

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secondary anticonvulsant—that is actually becoming a trusted first-line drug—is levetiracetam. “The amazing thing about levetiracetam, as opposed to phenobarbital and bromide, which are pro-inhibitory, is that it is anti-excitatory,” he says. “It affects the glutamate cells’ ability to release their neurotransmitters. That’s why it is less sedating and has an awesome therapeutic range. You can give the drug at well over 10 times the normal dose, and the only side effect you’re likely to see is sedation. It’s a very safe drug.”

Levetiracetam is available in injectable, liquid and tablet formulations, and now it’s available in an extended-release formulation. Aside from sedation, there are no commonly reported side effects. Also, it’s relatively affordable, doesn’t require monitoring, and decreases kindling (the phenomenon in which a seizure increases the likelihood that more seizures will occur). It has minimal hepatic metabolism as well. “It’s pretty much unnecessary to check blood levels because you just keep increasing the dose until it stops working or it gets too expensive,” Dr. Wininger says. “It’s great for animals that have suffered liver toxicosis but still require an anticonvulsant and can’t be on phenobarbital. And it’s great for portosystemic shunt cases that develop status epilepticus.”

Fact or fiction? Levetiracetam is an ineffectual solitary agent.

Fiction, says Dr. Wininger. He says that neurologists used to tell people that levetiracetam really didn’t work well on its own. However,

there’s now a lot of evidence suggesting that it does.^{1,2} A study of 19 dogs published in 2017 showed that when levetiracetam was used as a monotherapy, it was as effective as the standard of care as phenobarbital.³ So Dr. Wininger says, if you reach for levetiracetam as a first-line anticonvulsant, “you’re not alone, and it’s not a wrong thing to do.”

“I describe seizures as ‘the cough of the brain.’ They’re just a clinical sign; they’re not a disease. We want to get at the underlying cause.”

Fred Wininger, VMD, MS, DACVIM

Fact or fiction? Levetiracetam has a frequent honeymoon effect.

Dr. Wininger says this is also fiction. It used to be said that levetiracetam would work well for three to six months, and then its efficacy would decline. However, Dr. Wininger says the evidence has not proven this concern true: “Some dogs will have a decreased response to the current dosing, but it’s probably because of disease progression. If you provide them with a dose escalation, levetiracetam will often work well.”

Dr. Wininger does not usually use levetiracetam as a first-line agent, but there are certain dogs for which he makes an exception. For example, he will use it in dogs that have other neurologic deficits, often because they have postictal changes. He will also use levetiracetam in a geriatric dog that has a seizure and when there’s a possibility of a brain tumor.

“If I have any suspicion that a dog is not an idiopathic epileptic but it could be, levetiracetam is great,” says Dr. Wininger. “If you put a dog that might have a brain tumor on phenobarbital and it gets doopey, you have to wonder, is it the disease process causing it, or is it the drug? I really like levetiracetam in cases where I’m not confident of my diagnosis of idiopathic epilepsy.”

Fact or fiction? Levetiracetam has to be given exactly every eight hours.

Dr. Wininger says this is no longer true. It used to be that three-times-a-day dosing was a real problem for some clients. Administering a medication three times a day can be a daunting task and significantly reduces client compliance. However, an extended-release formulation of levetiracetam is now available.⁴ Dr. Wininger uses this formulation on almost all of his patients receiving levetiracetam. He says that in some dogs you can even administer a single daily dose of the extended-release formulation. “You can even put a toy-breed dog on an extended-release tablet two times a day,” says Dr. Wininger. “You know it’s going to be over the recommended dose, but the literature suggests it’s going to be OK. Use the extended-release formulation. It’s much easier to manage.”

Fact or fiction? Levetiracetam has little hepatic metabolism and the levels are unaffected by phenobarbital.

According to Dr. Wininger, this is also not true. “There is some hepatic metabolism of levetiracetam,” he says, “and if you have a dog concurrently on

phenobarbital, you may need to bump up the dose of levetiracetam a little bit more. The numbers suggest you'll need to increase the levetiracetam dose by 25% if the dog is on phenobarbital."

A new therapeutic algorithm

Dr. Winger says that the old algorithm recommended starting with monotherapy: "Pick phenobarbital. Pick bromide. If that doesn't work, go to polytherapy, adding on a second-line agent. But everything's been turned on its head now with levetiracetam." He says that levetiracetam may replace phenobarbital, but the two drugs have different mechanisms of action and can thus work well together. "You have a pro-inhibitory drug and an anti-excitatory drug. I think it makes sense to use them in concert," he says.

As researchers continue to explore pharmaceutical, surgical, nutritional and alternative therapies, the options should continue to grow to manage "the cough of the brain" in your veterinary patients.

Additional information, treatment options and references for this article can be found at dvm360.com/coughsofthebrain.

Handouts to help pet owners deal with seizures

"My pet is having a seizure!"

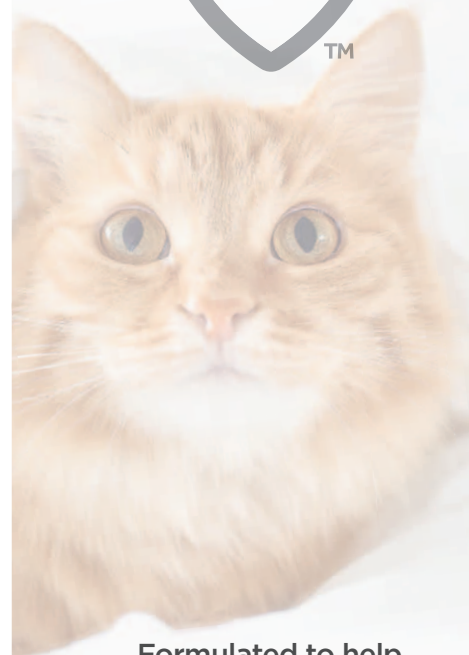
This panicked reply from a veterinary client when asked, "How can I help you?" over the phone can send front-desk team members into the same distressed space as the client. To bring everyone back to calm, we've got two resources they can turn to in the moment to talk clients through what to do next and make sure the patient gets the care it needs, thanks to Guardian Vets veterinary medical director Katherine Dohanue, DVM. First up is a clinic handout on what questions to ask a client when they call because their pet is exhibiting this upsetting neurologic upset. The second handout walks through the steps to take to assess how immediately the client needs to get to the clinic and what they can do to help their pet as they make their way to your practice.



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TOOTH RESORPTION: Name it to tame it



Tooth resorption is present in almost all our patients, but how do you classify it, and when do you treat it? Veterinary dentist Dr. Mary Volker has answers.

By Sarah J. Wooten, DVM

When it comes to tooth resorption, nomenclature is important, Fetch dvm360 educator Mary Krakowski Volker, DVM, DAVDC, a partner at Animal Dental Center, tells us. Why? Because treatment depends on the type of resorption present. And of course we don't use the same names in both dogs and cats because that would be too easy.

Currently, there are three types of tooth resorption in cats, and six types in dogs, and all of them are treated differently, says Dr. Volker. Are you treating correctly?

The case in cats

In Dr. Volker's mind, every cat has tooth resorption until proven otherwise—up to 67% are affected depending on which study you read. It's painful and progressive—we cannot stop the resorptive process—and the cause of the disease has

still not been determined. Tooth resorption is more common as cats age and is usually present in multiple teeth. The mandibular third premolar is the most common tooth affected. If you are examining a cat and notice a gingival "lump" in the area where a third premolar tooth should be, that is almost always secondary to tooth resorption, says Dr. Volker.

The types of feline tooth resorption

TYPE 1: A hole is present in the tooth (Figures 1 & 2). Typically, the resorptive lesion is found at the cemento-enamel junction or furcation. Radiographically, the tooth roots have the bright opacity of a root and a clear periodontal ligament space is present.

Treatment: Extraction is indicated.

TYPE 2: The roots are replaced with alveolar bone (you'll note

radiographic evidence of reduced radiopacity of the root and loss of periodontal ligament, and the roots will appear to have an opacity similar to adjacent alveolar bone; Figures 3-5).

Treatment: If the crown is involved, perform a crown amputation. If only the root is involved, periodic radiographic monitoring is recommended, or a crown amputation can be performed.

TYPE 3: One root is Type 2 and one root is Type 1 (Figure 6).

Treatment: Section the tooth, and treat each root according to the type of resorption present.

Note that early Type 2 tooth resorption is typically not painful if it only involves the root (i.e. if it is only radicular without coronal or supragingival involvement). It becomes painful when the crown is involved. If your explorer does not detect a lesion supragingivally, Dr. Volker says you can offer crown amputation at the time of diagnosis, but you do not necessarily have to treat at that time. However, it's very important to prepare the client by saying it will progress (but it may take years!) and will typically require treatment at some point.



Figure 1. Type 1 tooth resorption.



Figure 2. Type 1 tooth resorption.

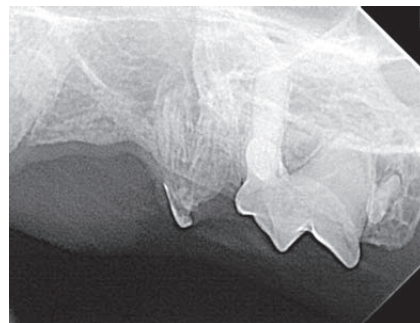


Figure 3. Type 2 tooth resorption.

The details in dogs

Tooth resorption is most common in large-breed dogs and older dogs, says Dr. Volker. In dogs, treatment depends on whether the tooth is alive or not as well as whether there's inflammatory tooth resorption. Even though there are six types, Dr. Volker says general practitioners should focus on the three most common types—non-inflammatory external replacement resorption, apical periodontitis (external inflammatory resorption) and external cervical root surface resorption.

Non-inflammatory external replacement resorption. This type of resorption is similar to Type 2 in cats and is most likely progressive. Most of the time, these teeth appear normal on oral examination and the dog is asymptomatic. The cause is unknown but the condition seems to occur more in dogs that are heavy chewers and may be due to the death of periodontal ligament fibers from repeated compression, says Dr. Volker. Periodic radiographic monitoring is recommended if there is only radicular (root) involvement and the teeth otherwise appear

vital radiographically and clinically. Treatment of lesions that involve the crown is crown amputation, but treatment is not required until the resorption involves the crown, at which point Dr. Volker says it becomes

painful. If you don't treat that day, remember to document it!

Apical periodontitis. External inflammatory resorption, AKA a tooth root abscess, is the most common type in dogs, says Dr. Volker. Carnassial teeth are over-represented because those are the teeth dogs tend to fracture. Dr. Volker perfectly describes this type as having a halo

around a "gnarly"-looking root apex on radiograph. In comparison, non-inflammatory external replacement resorption is smooth and has the opacity of bone. Technically speaking, she would

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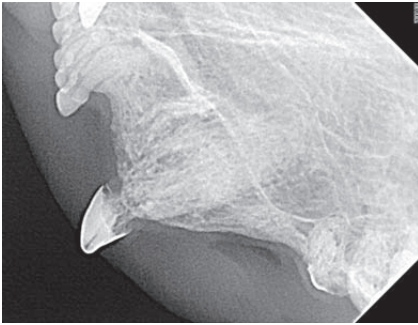


Figure 4. Type 2 tooth resorption.

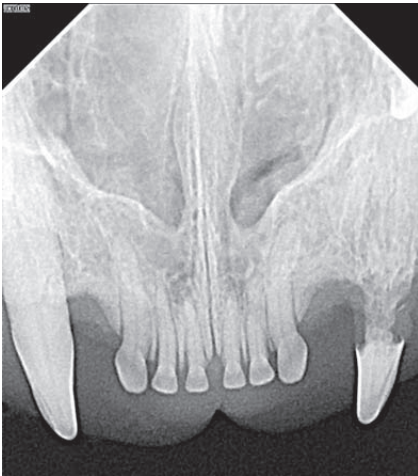


Figure 5. Type 2 tooth resorption.





Figure 6. A tooth with Type 3 tooth resorption, where the mesial root of the third premolar tooth has Type 1 tooth resorption and the distal root has Type 2 tooth resorption.


record it as "a complicated crown-fractured maxillary fourth premolar tooth with evidence of inflammatory apical resorption." Treatment is extraction or root canal therapy, depending on the degree of resorption.

Cervical root surface resorption. This is an external inflammatory resorptive defect at the cemento-enamel junction, often in the furcation. These guys look very similar to Type 1 resorption in cats and clinically present like a tooth with a big hole in it. Dr. Volker sees this condition most commonly in small-breed dogs with concurrent periodontal disease. These lesions will be noticeable in different locations than where caries might occur; caries tend to occur on occlusal surfaces whereas these resorptive lesions are near the cemento-enamel junction. Treatment is extraction.

Dr. Sarah Wooten is an associate veterinarian in Greeley, Colorado, a contributor to dvm360.com and a speaker at the Fetch dvm360 conferences.

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Disease containment space comes with a checklist of requirements—but dreariness isn't one of them. Check out these isolation ward photos from veterinary hospitals across the country to see how your colleagues care for these fragile patients while protecting the rest from outbreaks.

The isolation ward at 1st Pet Veterinary Centers in Mesa, Arizona, boasts large windows: one from the hallway for close monitoring by the veterinary team and one looking outdoors for lots of natural light. | Photo courtesy of Mark Boisclair, Mark Boisclair Photography.



The isolation unit at McGregor Boulevard Veterinary Clinic in Fort Myers, Florida, features a glass door and corner window so it's very visible. | Photo courtesy of Stuart Gobey, Island Studio Photography.



The isolation ward at Conejo Valley Veterinary Hospital in Thousand Oaks, California, is designed to be a hospital unto itself, with negative-pressure airflow. | Photo courtesy of Gregory Mancuso Photography.



At Conejo Valley Veterinary Hospital, the isolation ward run with epoxy walls and floor serves as a bathing station for parvo puppies. | Photo courtesy of Gregory Mancuso Photography.

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HELPFUL STUFF

Big pharmacy playas

By Sarah J. Wooten, DVM

Two companies stand out as the current competitors for veterinary practice online pharmacy partnerships: Vets First Choice and Vetsource. Here are the deets.

In the world of online veterinary pharmacies, there are two kinds of companies out there—the interlopers up in your business (you know, like 1-800-PetMeds and the corner-store pharmacy chain that now sells vet drugs, WTH?) and two bigger players in your corner: Vetsource and Vets First Choice (which calls itself a “comprehensive prescription management platform”). So if your veterinary hospital needs an online pharmacy (you do, champ) and you want to shop around or finally try one, satisfied veterinarians swear by both of these. Check out a head-to-head comparison at left based on Vets First Choice and Vetsource rep answers to questions on what

I’d look for in an online pharmacy.

If you want to know what would the online pharmacy cost the practice, here’s what their reps told me. Remember, check out what fee the pharmacy will charge you at your practice for common—and expensive—products if fee structure is a big consideration for you.

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	VETSOURCE	VETS FIRST CHOICE
Does the hospital control pricing?	YES	YES
Do they offer compound services?	YES currently serviced by Rood & Riddle; Wedgewood to be added by the end of June	YES owns its own pharmacies
Do they sell parasiticide single doses?	YES	YES
Do they sell generics?	YES	YES
How do they integrate with software?	Basic integration with 15 PIMS; “writeback” capability (prescription information automatically updated in patient records) with one PIMS (Cornerstone)	Basic integration with 22 PIMS for client/patient information access; “writeback” capability with six PIMS
How secure are the e-merchant services (credit cards, etc.?)	PCI-compliant; encryption and secure holding of credit card data	Level 2 service provider; standard precautions plus auditing by outside security assessor
When’s the phone call center open?	5 a.m.–5 p.m. M–F, 7 a.m.–1 p.m. PDT Saturday	9 a.m.–9 p.m. M–F, 10 a.m.–3 p.m. EST Saturday
Do they offer Rx compliance reports?	Coming soon	YES
How long does it take to ship?	Five to nine business days (expedited shipping available)	Three to five business days (overnight shipping available)

bottom line.

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> **Vetsource:** There are no setup costs or monthly fees. In general, the company charges a 15 percent fulfillment fee based on wholesale price for most products

and then a pharmacy fee when appropriate. Exceptions are low-cost items and heavy items like pet food (where the shipping costs are significant). Fees are fixed.

Additional benefits include free



shipping for your clients on 1) pet food, 2) items set up to auto-ship and 3) orders more than \$49; funded promotions that don't impact the practice's margins; and automated email marketing.

Last but not least, ask around with veterinary colleagues you trust about how these options are working for them. This is what company reps told us—your mileage may vary.

Dr. Sarah Wooten is an associate veterinarian in Greeley, Colorado, a contributor to dvm360.com and a speaker at the Fetch dvm360 conferences.

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PAIN POINT: Don't skip this pain management step

Dr. Michael Petty discusses one of his key takeaways for attendees of his upcoming pain management sessions at the Fetch dvm360 conferences.

By Sarah Mouton Dowdy

Michael Petty, DVM, CVPP, CVMA, CCRT, CAAPM, may have a lot of letters after his name, but one of the key takeaways for his upcoming Fetch dvm360 pain management sessions is relatively simple: Treating acute pain isn't difficult, but you have to measure it first.

Specialists and general practitioners alike must look at their patients, find the pain, treat the pain and then reevaluate to see if what they're doing is adequate or if adjustments need to be made, says Dr. Petty, who is a faculty member of the Canine Rehabilitation Institute in Wellington, Florida, and the owner of Arbor Pointe Veterinary Hospital in Canton, Michigan. "Without these steps, animals will suffer and your clients will know," he says.

Pain scales are a key component of finding and reevaluating the pain. "If you're not using pain scales, you're missing the pain in many of

your patients," says Dr. Petty.

Acute pain scales are designed to be used by veterinary professionals. For veterinarians and technicians who are just starting to use pain scales, Dr. Petty recommends using the Colorado State University acute pain scales. There's one for dogs and one for cats. He also says that NewMetrica has good acute pain scales for cats and dogs that have been validated.

When it comes to chronic pain scales, which are mostly meant to be used by clients at home, Dr. Petty likes the Feline Musculoskeletal Pain Index from North Carolina State University and the Cincinnati Orthopedic Disability Index for dogs.

You can get more advice and instruction from Dr. Petty in person at the Fetch dvm360 conferences this year. Visit **fetchdvm360.com** to learn more about his sessions.

Have a heart-to-heart on social media

If you find yourself overthinking your explanations for heart disease or breaking out a thesaurus to translate those hard-to-understand clinical terms into ones laypeople will understand, stop right there. These posts were made for you. Use them to tweet and write posts to keep your clients informed and, most importantly, keep them in touch with you and your veterinary clinic regarding their pet's health. Check them out at **dvm360.com/heartsocial**.



What it takes to get fired from her veterinary practice!



If your clinic is anything like Onion River Animal Hospital in Middlesex, Vermont, it takes a clearly defined screw-up for an employee to be fired. Hospital co-owner—and Fetch dvm360 conference speaker—Karen Bradley, DVM, says, "It would basically take a violation of one of our policies."

Dr. Bradley says she's lucky in that rarely does Onion River have to dismiss an employee—a scenario she attributes to depth and specificity of training.

"What we try to do the most is a lot of one-on-one coaching," she says.

But there may be cases where no infraction has occurred, yet an unproductive or toxic employee remains on staff—"sort of that poisoned staff person who can change the shape of a day, change an interaction into a negative one with a client," Dr. Bradley says.

Even in those cases, she says there's hope before it leads to termination. It takes clarity of training and personal attention, the likes of which is administered by Onion River's manager, a certified veterinary practice manager.

"She works really hard to sit down and review with them the inconsistencies and get them the training they need," Dr. Bradley says.

Watch the video at **dvm360.com/allfiredup**.



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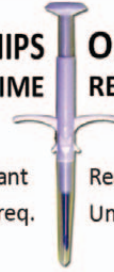
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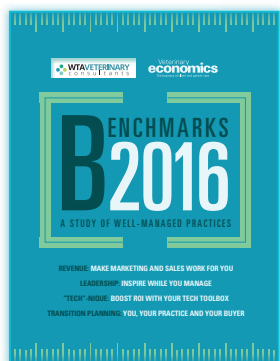
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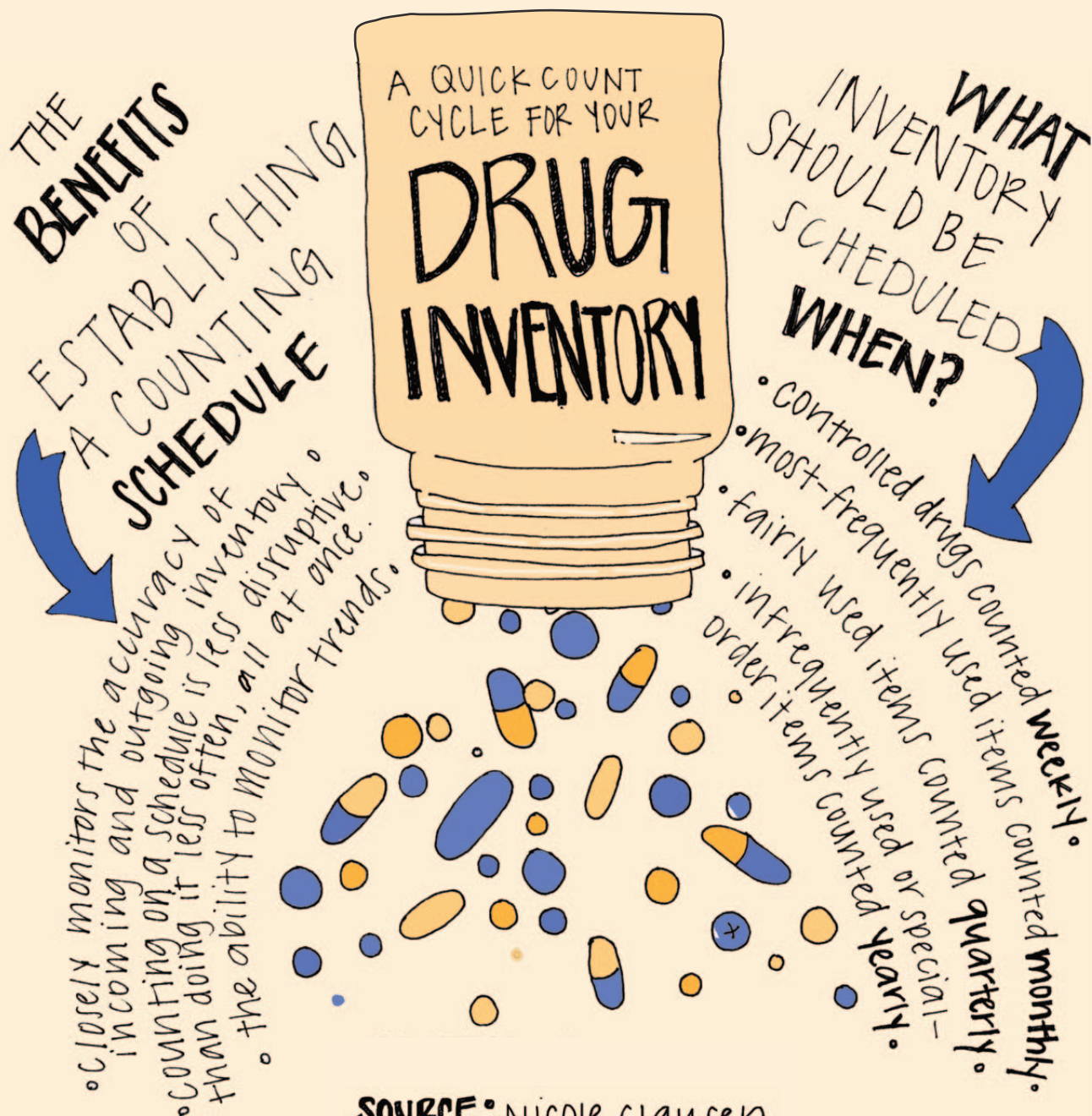


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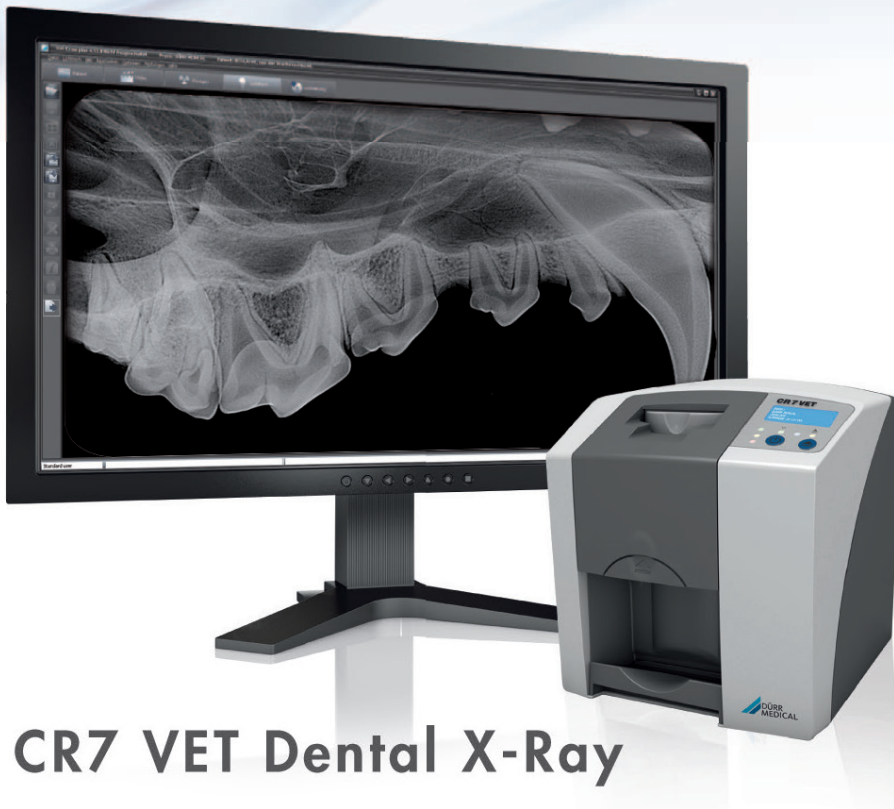


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