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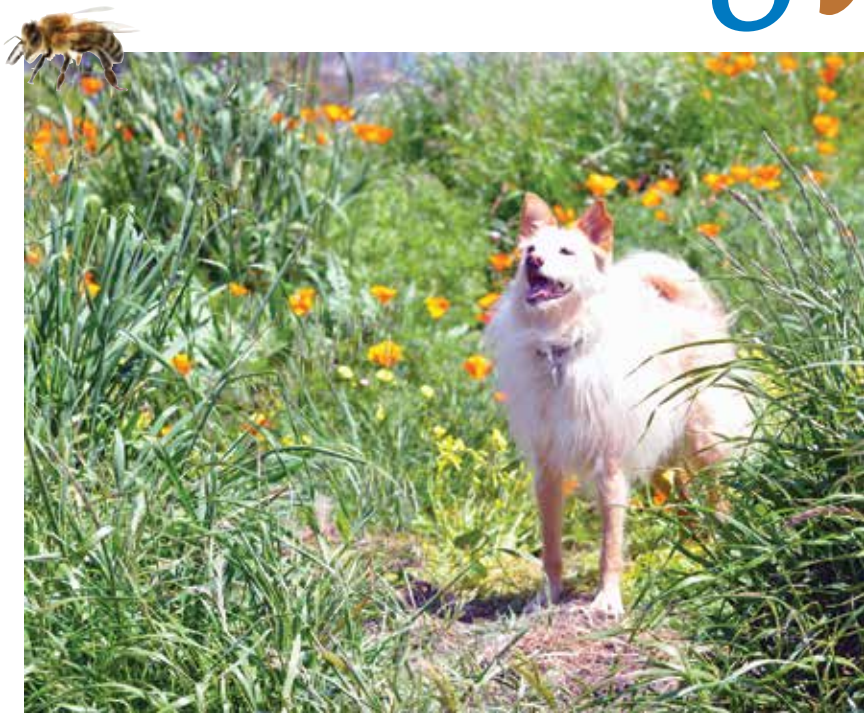
Your complete guide to natural dog care and training

Whole Dog Journal™



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Whole Dog Journal

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BY NANCY KERNS

EDITOR'S NOTE

A Bee Story

In memory of a sweet (if imprudent) dog from my youth.

Many years ago, my parents owned a German Shepherd Dog named Kale. (It wasn't pronounced like today's trendy vegetable; rather, the dog was named in dubious honor of a Hawaiian tough-guy former boyfriend of my oldest sister, and it was pronounced exactly like "Collie." That confused everyone, calling our German Shepherd, "Collie!" But I digress.)

Kale (the dog, not the Hawaiian boyfriend) was a confirmed and completely unrepentant bee-eater. He was also completely untrained; my stay-at-home mom bought him from a backyard breeder not long after I, the youngest child and last one to leave home, left the "nest." She needed another young being in the house to take care of – but she sort of forgot that I was the only one in the family who ever trained the family dogs. Kale grew up with zero direction, and like most GSDs, responded to the guidance vacuum by finding odd things to do with his time. Like hunt for bees.

Happily for Kale, there were almost always wasps flying around and under the deck that surrounded my parent's above-ground pool. The big, underemployed dog made it his nearly full-time hobby to patrol the deck for any flying insects, but *especially* any wasps that might try to sneak past him and build a papery nest under the deck. Also happily for Kale, he wasn't highly allergic to the many stings he suffered in the pursuit of his hobby. Oh, he often had a lumpy, swollen face, but we all sort of got used to it.

There was one benefit of his bee-obsession. Because he had no recall to speak of, my parents learned a trick to get his attention or to get him to come to them: They would mimic the buzzing of a bee, and he'd come running. Poor Kale! He never quite figured out that they were faking; he was enough of a good-hearted optimist that he would run to them and start looking for a bee. And given that my parents lived at that time in Petaluma, California, surrounded by dairy and beef cattle ranches and chicken farms, Kale's search was almost always rewarded with some sort of tangy flying insect.

In all seriousness, however, many dogs are not as lucky as Kale; some suffer supremely uncomfortable swelling, and some even die from anaphylactic shock after being stung by bees or wasps. For this reason, we're presenting you with not one but *two* articles that concern bees. The first, written by North Carolina veterinarian Catherine Carr Ashe, explains what you should know about the treating a dog who gets stung. And our Training Editor, Maryland dog trainer Pat Miller, explains how to teach bee-chasing dogs to leave bees alone, and how to teach dogs who panic at the sound of bees to just leave calmly.

NK

BY CATHERINE ASHE, DVM

HEALTH

Sting Operation

Dogs can be hurt or even killed by bees, wasps, hornets, and fire ants. Learn what you should do if your dog gets stung or bitten by these flying insects.

Spring is springing forth all over the country. Flowers, grasses, and trees are blooming, and the pollinators are out in force. This is great news for plants, and less great news for our canine friends. Dogs are more prone to being stung by insects than we are, given that they aren't always aware that some of the buzzing, flying insects they love to chase can *hurt!*

The most likely sting suspects are the *Hymenoptera* species, which include bees, wasps, hornets, and fire ants. As an emergency veterinarian, I often treated dogs who suffered bee and wasp stings, with reactions ranging from very mild localized swelling and pain to anaphylactic shock. These symptoms were sometimes caused by a direct sting to the muzzle or paw, but in some cases, they occurred when a dog ingested a bee! It's important to know what is normal and what is not when this happens.

The typical dog/bee/stinging event leaves the dog with a single sting on the muzzle or foot. This is because of dogs' horizontal, four-footed orientation and their innate curiosity. The feet often find the insects when running through the grass, and the curious muzzle will follow.

"BEE" ADVISED NOT TO PANIC

In the case of most stings, there will be very mild redness and swelling. Your dog may suddenly limp and/or favor a paw, or have a red, swollen spot on the face. In some cases, a stinger can still be found in the wound. This is extremely difficult to find without a still, calm dog and a magnifying glass. In some cases, removal of a stinger must be done at a veterinary office. You can try to visualize and remove it at home, but it may not be possible.

Initial treatment for a sting or bite of this severity can consist of rest and a cold compress to relieve swelling and pain. Do not administer over-the-counter medications; these are generally not safe for dogs. If you are concerned that your dog is in significant pain, contact your veterinarian to discuss a pain-management strategy.

Hives, wheals, and welts are a moderate reaction to stings. Just like their human counterparts, dogs who have been stung can break out in unsightly hives. These are usually very itchy and uncomfortable. The first sign often noticed is the dog rubbing along furniture or scratching at the face and eyes. The hives may manifest as bright red streaks or lumps all over the body or be confined to a single place.

As long as there is no attendant vomiting, diarrhea, weakness, or collapse, this can be managed at home successfully. Diphenhydramine (the active ingredient in

The swelling from a bee stings can be very dramatic. If your dog is lucky, it only looks strange and isn't too painful. A less-fortunate dog might require quick veterinary intervention to keep the swelling from closing the dog's airway.

Benadryl) can be given at 1 to 2 milligrams per pound of body weight. If using a Benadryl product, check to make sure there are NO other active ingredients. Some Benadryl products contain decongestants as well, and these can be dangerous for dogs.

Diphenhydramine can be repeated every six to eight hours as needed to help with hives. They can sometimes take hours to a few days to completely resolve. Diphenhydramine can cause drowsiness, but in some dogs, it can cause excitement (called a paradoxical reaction).

SHOCKING DEVELOPMENT

In the most severe cases, dogs can develop anaphylactic shock. In canines, the shock organ is the gastrointestinal (GI) tract (in contrast to cats and humans, in which it is the lungs). Dogs in anaphylactic shock do not necessarily develop difficulty breathing. They are much more likely to develop sudden onset of vomiting, diarrhea, and collapse. The diarrhea and vomit can both be extremely bloody, in some cases.

This is an absolute emergency and should be treated as such. Once evaluated by a veterinarian, your dog will be treated with intravenous (IV) fluids, epinephrine, possibly steroids, oxygen, and very close monitoring. Diagnostic testing will likely include blood pressure monitoring, bloodwork, and maybe an abdominal ultrasound.

Often, when dogs are stung, it is not witnessed, so it can be difficult to determine the cause of the signs. Anaphylaxis can also look like an Addisonian crisis; severe, acute hemorrhagic gastroenteritis (HGE); or mesenteric volvulus. One helpful test is the abdominal ultrasound. Gallbladder wall swelling (edema) can be used to determine if anaphylaxis is the true cause of the signs. Another indicator is that anaphylaxis is a very sudden onset in a previously healthy dog that has just been outside.

With rapid and aggressive treatment, most dogs will recover from this type of shock, but early treatment is essential. In some cases, your veterinarian may recommend carrying an EpiPen Jr for future outdoor travels with your dog. Despite having this on hand, any suspicion of an anaphylactic event should prompt immediate evaluation by your veterinarian.

MULTIPLE STINGS

Initial symptoms in dogs include multiple bites, marked pain and swelling, hyperthermia (temperature can elevate to a deadly 107 degrees), heavy panting, rapid heart rate, and in some cases, muscle tremoring.

There is no antidote, so treatment is aimed at supportive care. This must be aggressive, as dogs can later develop systemic effects such as kidney failure. The kidney failure develops due to generalized muscle trauma from the stings and hyperthermia. When the muscle is damaged, extra myoglobin (a muscle enzyme) is released into the bloodstream. This must be metabolized by the kidneys, and excess amounts can cause renal damage. This will lead to a dark brown color to urine and elevated blood urea nitrogen (BUN) and creatinine.

Treatment is centered on maintaining hydration with IV fluids, pain relief medications (generally strong drugs like opioids), and close monitoring of vitals and bloodwork. NSAIDs like carprofen and meloxicam should be avoided due to the risk of kidney failure.

A different and less-common scenario is a sting to the inside of the mouth or the tongue. These stings can be more severe because of the amount of pain and swelling. In rare cases, swelling in the mouth could lead to airway inflammation, obstruction, and labored breathing. While this isn't common, it can happen. If you know that your dog was stung in the mouth or on the tongue, monitor closely for *any* signs of respiratory distress. These include wheezing or other noisy breathing, coughing, and difficulty pulling air into the lungs (inspiratory dyspnea). Seek veterinary care!

In these cases, your dog may need to receive respiratory support. This might include an oxygen mask, nasal oxygen prongs, or in serious cases, where the upper airway is obstructed, the placement of an emergency tracheostomy tube. This allows the veterinarian to bypass the swollen upper airway and provide the patient with life-saving oxygen. These are temporary and will be removed when the swelling has resolved enough to allow normal respiration.

Most reactions to bee stings are mild, but it is important to recognize the more severe symptoms so that immediate treatment can be started and systemic effects minimized.

WHAT ABOUT KILLER BEES?

A special note about Africanized killer bees should be made. These are a hybrid of two honeybees: the western honey bee and the Iberian honey bee. They were hybridized in Brazil in the 1950s with hopes of increasing honey production. Unfortunately, swarms escaped quarantine and migrated through Central America and into the Southwest and Florida. These bees are still largely isolated to those areas, but with global temperatures in flux, they can be expected to spread.

Unlike the usually docile honey bee, these bees can be very easily aggravated and aggressive and even chase victims. When annoyed, they tend to attack in large swarms. Interestingly, the venom is the same as other honey bees, which are rarely fatal. It is the multiple stings that can be fatal for animals and humans.

Catherine Ashe, DVM, practiced emergency medicine for nine years and now works as an associate veterinarian at Skyland Animal Hospital in Asheville, N.C.

BY PAT MILLER, CBCC-KA, CPDT-KA

TRAINING

Teach Your Dog to Bee Safe

Buzz off! How to train your bee-chasing, bee-eating, or bee-phobic dog to coexist calmly with stinging insects.

You would think that a bee sting or two would be aversive enough to convince a dog to give flying, stinging creatures a wide berth. Would that it were so.

But just like a good skunking doesn't stop most dogs from going after those black-and-white critters again the next time (darn it!), there are many dogs who seem goaded into more intense bee-chasing behavior after an unfortunate encounter of the stinging kind. Conversely, there are also dogs who become literally *phobic* about all small, flying creatures after a stinging incident. Then there are those who develop an obsessive-compulsive behavior known as fly-snapping when there are no flying insects present at all. (See "Fly-Snapping: Not Really About Flies," page 6.)

For a class of insects vital to our survival through their pollination efforts, bees (and their nastier cousins, wasps) can sure wreak havoc with our dogs' behavior.

It's understandable how hovering insects can be annoying – or intriguing – to a dog. We humans don't like small flying creatures in our faces either, but we learn fairly early in life that some are more wisely respected than harassed. I may swat a fly, but I earned the nickname "bee whisperer" at a recent trainer academy when I gently escorted several wasps out of the training center with a plastic cup and a piece of cardboard.

In contrast, dogs are more likely to snap at the buzzing annoyances and end up with a painful (and possibly deadly) sting to the face. So, what do you do about a dog who has risky or inappropriate bee- or wasp-related behavior? Why, *beehavior* modification, of course!

Bee chasers are at greatest risk for injury as they run after and snap at the little buzzers. But bee-phobic dogs also may have significant quality-of life issues, as bees can cause them to shut down, tremble uncontrollably, and even run away in panic – and their fear behavior is sometimes generalized to other flying insects as well.

MANAGEMENT WINS AGAIN!

To change those behaviors, as with most behavior modification programs, we start with management. There are a variety of ways to deter and discourage bees from congregating in and around your home.

A Google search will give you a number of options for non-toxic bee and wasp repellents. I particularly like this recipe:

> Fill an empty spray bottle with water, nearly to the top. Add a few teaspoons of liquid dish soap; this will help the next ingredients will dissolve and evenly distribute in the mixture. Add a few drops of peppermint essential oil – enough so that you can readily smell it when you spray the mixture. Then add ⅛ teaspoon each of cinnamon and cayenne pepper and shake well.

Think ahead, and don't set up your dog to fail! If she's a bee-chaser, leave her at home when planning a springtime hike in environments where pollinators will be out in force.

Once you've mixed the repellent, spray away, in any place where you want to repel flying insects. Indoors, mist lightly on windowsills and door frames to discourage winged intruders. Outdoors, you can spray on the underside of patio tables, chairs, and shade umbrellas (to prevent patio users from touching the slightly sticky spray).

Additionally, there are a number of plants you can grow that help to repel bees and wasps, including cucumber, basil, geraniums, marigolds, citronella, and mint.

Conversely, there are plants that *attract* bees. Make sure not to plant these, or else plant them far enough away from your home that they are inviting the bees away from the areas where your dog spends time. Some of the plants that are particularly attractive to bees include bee balm, blackeyed susan, goldenrod, butterly bush, purple coneflower, lavender, roses, sunflowers, and salvia.

I discovered the value of using an attractant to lure wasps away from my dog-training area after I was stung on my ring finger by a yellowjacket when I was teaching outdoor classes in Santa Cruz, California. (Quick, get the ring off before the finger swells!) We used a lot of meaty treats in the class, and yellowjackets are carnivorous – they *love* meat. I learned to open a can of smelly cat food before each class and place it on a picnic table some distance from the training yard. Problem solved.

You might also consult a professional about other ways to remove bees and wasps (and their nests) from the area around your home. Just remember, for your own dog's safety and the health of our planet, make sure your professionals use non-toxic methods for bee and wasp removal and deterrence.

"BEEHAVIOR" MODIFICATION

So, what is it that's reinforcing the bee-chaser's behavior? If you have a dog who is captivated by movement (think herding dogs, hunting dogs, and terriers), it may simply be that the behavior is driven by the genetic propensity to be reinforced by the

Fly-Snapping: Not Really About Flies

Fly-snapping is one of several obsessive-compulsive disorders (OCDs) that occasionally occur in dogs. (See "Really Obsessed," WDJ September 2010.) This behavior is not about snapping at real flies (or bees, or wasps). Rather, the dog appears to be snapping at imaginary flies, or hallucinations. There are several possible explanations for the behavior:

- There is a strong genetic component. Certain breeds of dogs, including the Bull Terrier, the Bernese Mountain Dog, and the Cavalier King Charles Spaniel, are afflicted with fly-snapping at a much higher rate than many other breeds.

- It may be a digestive issue. There does appear to be a correlation between fly-snapping and significant digestive disorder, especially when the snapping is directed downward to toward the dog's sides rather than up in the air. A 2012 study ("Prospective Medical Evaluation of Seven Dogs Presented with Fly Biting") found gastrointestinal issues in all of the seven dogs examined for the study.

- It may be neurological/seizure-related. One theory holds that fly-snapping results from focal seizures – where only a specific part of the brain is affected, hence the absence of what we normally identify as "seizure" activity. https://vcahospitals.com/know-your-pet/focal-seizures-and-fly-biting

Some cases of fly-snapping can be successfully resolved with early behavioral intervention. Since OCDs are often triggered by stress, stress reduction and removal can be effective.

The first fly-snapping case I saw was a young Bernese Mountain Dog who had just begun the behavior. Stress reduction, increase in enrichment, and removal of any attention for the snapping behavior successfully eliminated the snapping. The three-year-old Cavalier King Charles Spaniel I met who had been snapping since the age of six months was not so fortunate – she ended up having to be medicated for the rest of her life.

If you think your dog is fly-snapping – get some professional help!

This German Shorthaired Pointer parks herself in the doorway so she can catch flies that try to come indoors. Her hobby hasn't risen to the level of an obsession, fortunately. She can be distracted from this task relatively easily.

opportunity to run after (and perhaps capture) things that move – sheep, cows, squirrels, rabbits, and yes, bees. These are the dogs who seem to think bee-chasing is a fun game. Alternatively, it could a strong emotional response because bees cause pain. These are the dogs who have probably been stung in the past, and seem angry or unhappy when they snap at and chase after the annoying, stinging creatures. In both cases, your goal is to change your dog's behavior in the presence of the flying bugs.

Of course, the bee-fearful dog's behavior also needs to be modified. Fear is a more normal and far safer behavior in the presence of bees – but what I'm talking about here are the dogs who are so fearful they cannot function.

While I normally begin with counter-conditioning (changing the association with the stimulus – in this case, the bee) for fear-related behaviors, for *severe* fear of bees, I suggest an "operant" approach, due to the difficulty in controlling the intensity of stimulus (the number, proximity, and predictability of the bees).

Note: If your dog has *very* strong fear-reactions to bees and wasps and/or behavior modification doesn't help, we urge you to consult a veterinarian who is knowledgeable about behavior or a veterinary behaviorist. You can also ask your veterinarian to do a phone consult with a veterinary behaviorist to determine if medication is appropriate, and if so, what kind. Your dog needs help!

Start by teaching your dog an incompatible behavior – something the dog can't do at the same time as chasing bees. It also should be something that your dog comes to love so much that when a bee appears you can cue your dog to perform (and get reinforced for!) and she will be consistently *thrilled* to do the behavior. This could be chasing a ball, finding treats dropped at your feet, targeting to your hand, lying down on a mat, or doing a trick. You can select one specific behavior and teach her to automatically offer that behavior when a bee appears, or you can choose to cue any one of several behaviors that she dearly loves.

This is likely to be easier with dogs who are happy chasers than with the ones who are angry chasers or fearful bee-avoiders, as anger and fear are stronger emotions to overcome. But with good training it can be accomplished with all of them. Here's how:

1 Select one behavior to start with (you can add more later if you want). If your dog already has a behavior she loves, use that. Just be sure it's one that elicits a happy dance when you cue her to do it. Or pick a new behavior that you think will succeed in making her eyes light up.

2 Begin training the behavior in the total absence of all bees. Make it a fun game, with lots of play reinforcement as well as treats.

3 When she is delighted about having you ask her to do the behavior, generalize it to a variety of environments with a wide variety of distractions (but no bees yet!), until she is just as focused and engaged anywhere.

4 Now comes the hard part. Because we can't control the bees, and realistic-looking remote-controlled bees are not readily available, we can't control the intensity of stimulus as well as we would like. Ideally, you would find a location where a very occasional bee will buzz past at a distance close enough to be noticed, but not in your dog's face.

Be careful! If the bee comes too close while you're asking her to do her incompatible behavior, you could give her a negative association with the behavior and undo all your hard work!

As soon as she notices the bee, ask your dog for her "bee happy" behavior. Repeat until the bee is gone. Or, if it looks as though the bee is going to buzz around for a while, or if your dog looks at all worried or aroused, move away from the area as you ask for the incompatible, happy behavior.

5 Continue to practice this in a low bee-intensity area, until your dog automatically looks to you or offers her happy bee-behavior when she sees a bee. While you have operantly taught her a happy bee-behavior, you also have changed her classical association with the presence of a bee: "Bees make the opportunity for my fun behavior happen!"

6 Now move closer to where more bees congregate. If your dog can perform and still have fun in this area, you're good. If not, you need a location with fewer bees, and/or need to be farther away. Be careful!

7 Next try it in a higher-density bee environment. Again, if your dog can still perform and be happy, you're good. If not, you need fewer bees and/or need to be farther away.

8 When your dog's happy response is well established in the presence of bees in reasonably close proximity, very gradually reduce your cueing of the behavior. First, wait a few seconds before you cue it, then wait longer, and occasionally don't ask for it at all. You will still (and forever) continue to cue the behavior sometimes when the two of you are in the presence of bees. But your goal is to have your dog so well programmed that she won't revert to bee chasing even if you're not there to ask for her happy bee behavior.

"BEE" SMART

Remember that your dog's undesirable behavior around bees can easily resurface if you forget to keep practicing her be-happy behavior(s) in the presence of flying, stinging buzzers. Continue to use good bee-management practices so our honey-producing, plant-pollinating friends (and their not-so-helpful cousins, the wasps) keep their distance from your canine pal.

Author Pat Miller, CBCC-KA, CPDT-KA, is WDJ's Training Editor and owner of the Peaceable Paws training center in Fairplay, MD. See page 24 for contact information.

BY PAT MILLER, CBCC-KA, CPDT-KA

PRODUCT REVIEW

Play With Your Food

These food-dispensing toys and tools make your dog eat more slowly, keeping him challenged and entertained (without getting fat!).

The Kong Wobbler is a hard plastic toy with a weighted bottom, so that it rights itself after every paw or nose-nudge, making the dog keep working to get the kibble or treats to fall out of the hole. Top and bottom are screwed together (like a jar lid) for easy loading and washing.

Purchasing information for examples of products in each category, as well as for each product seen here, appears on page 22.

If you're not using treat-dispensing toys with your dog, you're missing out on one of the greatest training inventions of the last 100 years – seriously!

These wonderful tools and toys can help you with a long list of dog-training and -management challenges, including boredom-busting, excessively fast eating, high-energy consumption, building mental skills, counter-conditioning, redirecting inappropriate behavior, and much more.

In the mid-1980s, when I acquired my first Australian Kelpie, food-stuffed toys were an unknown. A tennis ball was "the thing" – and Keli, my Kelpie, was quite addicted to hers. Then we discovered the Kong. Still perceived primarily as a fetch toy in those days, the hollow, snowman-shaped, hard, rubber toy delighted my dog with its high-flying unpredictable bounces. Almost as good as herding sheep! She switched her allegiance from ball to Kong.

Then one day Jean Donaldson – dog trainer, founder of the Academy for Dog Trainers, and book author extraordinaire, suggested stuffing treats in the Kong's hollow interior in order to entertain otherwise bored dogs. The food-dispensing dog-toy revolution was on.

The market has expanded since those early days when the Kong Company pretty much had a food-toy monopoly. Or should I say *exploded?* Today your options include an almost endless variety of products that contain food that will entice and challenge your dog. These products encourage him to chew, lick, nudge, paw, and toss in order to find and reach the food.

We still love the basic Kong toy, as well as the variety of other toys made by Kong. But we have to admit, we also love many of Kong's competitors in the food-stuffable toy category. In fact, there are so many it's hard to even have favorites anymore! But at a minimum, we think you should be aware of how many options are available to you and your dog today, so you can select the ones that are best suited to your own dog's needs and wants.

SNUFFLE MATS

It's a simple concept: short pieces of fleece tied onto a flat plastic or rubber frame, creating a tufted surface, ideal for scattering or hiding kibble or treats. Originally, the snuffle mat was a takeoff on the idea of scattering a dog's food in some grass, so it would take him a while to find and eat his meal.

When I first heard of snuffle mats, they were a do-it-yourself project. Not long after, I started seeing mats made by individuals and sold in a small cottage industry, and not long after that, the concept became quite commercialized. While you can still easily make a snuffle mat for your dog, you can also purchase several creative variations, with rubbery fingers instead of fleece tufts, fleece

Paw5's Wooly snuffle mat is durable. We have one that has held up to three years of daily use and frequent machine washing and drying.

tufts of varying lengths and patterns, and activity mats that include pockets and other treat-finding challenges in addition to the tufts and fingers.

These mats can serve several different purposes. They are perfect for dogs who eat too quickly and are at constant risk of choking on a bowlful of unchewed food or inhaling bits of their food. Sniffing out and retrieving bits of food from the many mat crevices is guaranteed to slow down the most ravenous speed-eater.

Snuffle mats are also useful for keeping your dog occupied during events when she might otherwise get fussy. My dog Kai's snuffle mat was a godsend while he impatiently waited his turn at agility class. The mat kept him calmly and happily searching for treats instead of barking from frustration and arousal at the sight of other dogs running the course.

The mats also may be used to keep your dog from getting bored when left alone (not recommended for a persistent or aggressive chewer!). Just load the mat, set it down for her in her "home-alone" space, and you're good to go.

Some dogs, especially the gentler, less assertive ones, need a little help learning how to use the mat. You may need to start by dropping treats on top, rather than burying them deep in the mat. As your dog gets the idea, you can start pushing treats deeper and deeper into the tufts, until your dog really has to work to get them.

BENEFITS

✓ Toss in the washing machine when they start getting sticky, stinky, or moldy; many can also be put in the dryer.

✓ The dog gets to use her sense of smell, touch, and taste to find food.

CAUTION

✓ Dogs can chew these up (and ingest them!). Do not leave your dog alone with a snuffle mat if she's an aggressive chewer and/or prone to ingesting non-food items.

FILL WITH FOOD TO LICK AND CHEW

The snowman-shaped Kong toy is still around, of course, and is still a great choice for stuffing food into, as well as a fetch toy. While not indestructible, the black Kongs are very tough and a wise choice for the aggressive chewer. In fact, I still have the original black Kong that Keli happily chased some 30-plus years ago. It's a little worse for wear, but it's still here!

In addition to the classic red and black Kongs, the Kong Company also offers "puppy" Kongs in pink and blue that are a little softer and easier to chew.

Between Kong Company and their competitors (including Busy Buddy, Idepet, Trixie, and others), there is an almost endless list of food-stuffable toys of various shapes, colors, sizes, and materials. Some are grooved, inviting your dog to lick squeeze cheese or peanut butter from the grooves. Some are hollow, encouraging chewing more than licking. You can stuff your dog's entire meal into a few hollow toys, and even freeze them, to slow down the fast eater and keep the bored dog occupied for a longer time. Our freezers almost always contain a few!

The classic Kong toy is still King in our households. They hold up well to countless trips to the freezer, the dishwasher, and back, and can even come back to work after a term of burying or abandonment in the sun.

BENEFITS

✓ Most are dishwasher safe.

✓ Wide variety of products; novel products will keep your dog engaged.

CAUTIONS

✓ Some dogs have little interest in actively chewing to access treats and food. You may have to encourage yours, or choose a different type of food toy.

✓ Dogs can chew these up (and ingest them!). Either select super-tough toys specifically designed for aggressive chewers or do not leave your dog alone with her food-stuffed toy if she's an aggressive chewer.

KIBBLE-DRIBBLING TOYS

I call these products "push toys," because dogs need to push and roll them around in order to get kibble to fall out of them. What they all have in common is a compartment that you can fill with kibble or other small, hard treats, and a hole for the treats to spill out off, provided the dog rolls it over and over.

The first product like this that I ever saw was the Buster Cube – a hard plastic cube with rounded corners and a hole on one side for the treats to spill out of. Omega Paw's Tricky Treat Ball was similar, but made of a softer vinyl material that didn't make such an ungodly racket as a dog rolled and bashed it around, making the food fall out a piece or two at a time.

Today, there are many variations of these kibble-dribbling toys, including those original products. Look for products that won't spill all the goods too quickly, but aren't so difficult to

Omega Paw's Tricky Treat Ball is a little difficult to clean, and not the most durable push-toy on the market, but it's thankfully quiet, even on hard wood floors.

get food out of that your dog gives up in frustration. Another nice feature is the ability to open the toy in order to empty it completely every so often; you don't want pieces of kibble to get stuck inside, grow moldy, and only then fall out and be eaten by your dog.

Kong came out with a product that we like a lot: the Kong Wobbler, which is shaped like the original Kong, but made of two hard plastic halves that screw together, making it incredibly easy to load with kibble or treats and open afterward for cleaning. The bottom half is weighted so that the toy rights itself after each push, which increases the interactive nature of the toy and makes it a bit more engaging than some of the other push toys. Our pot-bellied pig, Dexter, happily eats part of his meal from a Kong Wobbler!

Note that, depending on the level of difficulty, your dog may need to be taught how to use these toys. Roll or push it over several times so she can see the treat fall out (and eat it) each time. Encourage her to use her nose and/or paws to engage the toy until she realizes that *she* can make the treats appear.

BENEFITS

✓ More interactive than most of these other products; playful dogs will particularly enjoy these.

CAUTIONS

✓ Because these toys are meant to be pushed or pawed around in order to dispense the treats, they are not necessarily able to withstand chewing (unlike the products mentioned in the previous category, which are designed to give up their food stuffing by being licked and chewed). These products would not be appropriate for dogs whose go-to tactic is to try to chew the food out of the toy. Dedicated chewers can damage, chew, and ingest pieces of these toys if they are so inclined.

✓ Be aware! These toys can be very noisy, especially on hard floors.

SLOW-FEEDER BOWLS

In contrast to the push-around toys, these products are designed to be stationary – though they, too, are meant to slow down speed eaters. Slow feeding is believed to decrease the potential for life-threatening choking or bloat, a not-uncommon problem in dogs who inhale their meals.

These products are usually grooved or have pegs in the bowl, requiring the dog to use her tongue to reach the food. They are often weighted and/or equipped with non-skid feet and a wide base to minimize spillage. They may not be quite as challenging as some of the other food-toy products, though this makes them a good choice for dogs who get easily discouraged and stop trying to get treats from the more difficult designs.

BENEFITS

Outward Hound makes a number of "Slo Bowls" in various designs, colors, and sizes.

✓ These products work equally well for feeding dry food, wet food, raw frozen, or home-prepared.

✓ Most are dishwasher-safe.

CAUTIONS

✓ The grooves in some designs can make these bowls difficult to wash without a dishwasher.

✓ Most of these products are made for larger dogs; fewer models are available for small dogs.

LICKY-STICKY THINGS

Compared to some of the other food-dispensing toys, "licky-sticky" is a relatively new concept. This category describes products that are meant to be filled with a type of food that the dog can remove only by determined and prolonged licking, such as peanut butter, cream cheese, yogurt, baby food, or a pâté-type canned food – and that are designed to be affixed to a stationary position (usually with suction cups).

Prior to the invention of these products, I've suggested to clients that they just smear cheese or peanut butter on the refrigerator door or shower wall. I can see how some might prefer this alternative!

The thing I like best about these is that they can keep your dog relatively immobile, happily occupied, and licking/eating, while you attend to a husbandry task that requires two hands, such as buckling a muzzle, bathing, grooming, taking a temperature, etc. That's so useful that I actually squealed with delight the first time I saw one!

BENEFITS

✓ Because the dog can't carry them off to enjoy in private, these are great for keeping him in one spot, without force or restraint.

✓ The dog's enjoyment of delicious treats may classically condition him to associate grooming (or whatever you are doing to him while he licks the food) with good things, making him more happier to cooperate and participate.

The suction cups on Chase 'N Chomp's Sticky Bone can be used to secure the toy to any smooth surface.

CAUTIONS

✓ These products may not be a good choice for a dog who has food-guarding behavior, unless and until behavior modification has been done.

✓ If your dog is prone to chewing up toys, don't leave him unattended with any of these products. Most are flexible and not durable, as they are meant for licking, not chewing.

INTERACTIVE TOYS AND DOG "PUZZLES"

Interactive toys have become very popular since they first appeared a decade or so ago – and with good reason. They make a dog work for her treats, with her brain as well as her body! Brain games are incredibly useful for keeping dogs mentally as well as physically healthy.

Swedish dog-toy designer Nina Ottosson started developing her line of interactive toys in 1990. Today, there are dozens of her products on the market, as well as many from other designers. Some are clear-cut imitators, others are quite innovative and original. All are guaranteed to provide dogs with fun and stimulation.

Just a few dog puzzles designed by Nina Ottosson.

BENEFITS

✓ These are fun for all dogs, but especially useful for helping to entertain and occupy senior, handicapped, or rehabilitating dogs who need to be kept calm.

✓ Because most of these were designed to have the human interacting with the dog as the dog interacts with the toy, they are also good for relationship-building.

CAUTIONS

✓ Some of these interactive toy puzzles are quite complex and challenging. Your dog may need some assistance, at least at first, to help her succeed and learn, and avoid frustration. Start with simpler toys and work up to the more challenging ones once she understands how the games are played.

✓ The early Nina Ottosson toys were made of wood – easily chewed and hard to clean. More recent models are made of plastic; still some have small pieces that your dog can chew up if you are inattentive.

✓ These toys are designed to be used under human supervision. Many of them are easily destroyed if left with your dog unattended.

ELECTRONIC TREAT DISPENSERS

Last, but by no means least, is a new generation of computerized electronic food-dispensing toys, giving a whole new look and feel to the treat-dispensing toy market.

The earliest products in this category allowed you use a remote control to release a treat to your dog at a distance from you. Next, they came with timers, so you could release meals or treats at pre-set or random intervals (helpful for preoccupying dogs with separation anxiety or isolation distress). Today, some allow your to dispense treats to (and sometimes, communicate with) your dog from remote locations, via an app on your phone or computer!

Many dog owners and trainers are fascinated with the technology. Some products can be set to beep randomly to signal to your dog that a treat is coming, and some will actually take pictures of your dog as she arrives to eat the treat.

I will confess I'm a technology troglodyte and am pretty intimidated by these products! But I do love the remote treat-dispenser function that allows you to signal to your dog the opportunity for a treat from 50 to 500 feet away, depending on the brand. This type of toy has many helpful applications, such as when visitors arrive, you can use its function to move your dog away from the door (as he runs to get his treats from the machine that you have set up elsewhere). Other training and management applications include situations where you want the dog to go to her bed, move away from begging at the table, stop obsessing over squirrels or UPS trucks outside, and more.

BENEFITS

✓ Brilliant for engaging dogs who are easily bored when left home alone. Anticipation of random treats can keep the canine brain engaged and out of trouble.

✓ Surveillance features (still camera, one- or two-way audio, video, and/or live-stream monitoring), ease owner anxieties about home-alone dogs, too.

CAUTIONS

✓ The remote treat-dispensing function can potentially cause problems in a multi-dog household, especially if there is competition for resources. Be careful!

✓ Some of the fancier high-tech products require a fair amount of Internet bandwidth to function. If you are on satellite/limited bandwidth, they may not work or be optimal for you.

✓ You do need to be somewhat tech-savvy – or have access to someone who is – to figure some of this stuff out!

✓ These can be quite pricey.

LOTS TO CHOOSE FROM

As you can see, there are many options for teaching your dog to play with her food. A list of examples of products in each category appears on page 22. Find the ones that are likely to appeal to her – and to you – and get started!

Author Pat Miller, CBCC-KA, CPDT-KA, is WDJ's Training Editor. She live in Fairplay, Maryland, site of her Peaceable Paws training center. See "Resources," page 24, for contact information.

BY CATHERINE ASHE, DVM

HEALTH

Save the Liver!

This important organ plays a central role in all metabolic processes in the body, detoxifies chemicals, metabolizes drugs, and manufactures critical blood-clotting agents.

Little attention is paid to the dog's liver, part of the hepatobiliary tree (which also includes the gallbladder and bile ducts). The oversight is odd, because the liver performs many important jobs in the dog's body. It's responsible for everything from production of protein and clotting factors to mobilization of glucose from fat stores to provide energy. It metabolizes drugs and filters the blood. It can even regenerate if damaged. As much as 75 percent of the liver can be compromised before any clinical signs are seen. Due to its many functions, it is also susceptible to infection, inflammation, toxins, and cancers.

Signs of liver disease can include lethargy, decreased appetite, vomiting, diarrhea, bruising of the skin (small patches of bruising are called petechiae; larger patches are called ecchymoses), abdominal distention, weakness, and a yellow tint to the skin and gums (called jaundice or icterus).

LIVER TESTS

If your veterinarian is concerned about liver disease, she may recommend several tests. The first and least invasive tests are blood tests, including a complete blood count (CBC) and chemistry panel.

The CBC evaluates red blood cells, white blood cells, and platelets, all of which can be affected with liver dysfunction.

The chemistry panel can evaluate values for individual enzymes released by the liver. These are the alanine transferase (ALT), alkaline phosphatase (ALP), gamma glutamyl transferase (GGT), and total bilirubin (Tbili). These tests are basic liver assessments, but they do not indicate actual liver function.

ALT is an enzyme that may be released with any source of damage to the liver. Blunt trauma, anaphylactic reaction, systemic illness such as thyroid disorders, and other problems that have nothing to do with the liver can cause an elevation of ALT in the blood. Just because ALT is elevated doesn't mean the liver is failing, however. This result is interpreted in conjunction with clinical signs and other bloodwork and imaging changes.

In contrast, the liver enzymes ALP and GGT are released only in response to a problem in

The signs of advanced liver disease can be quite dramatic. The dog below is displaying widespread ecchymotic hemorrhage, caused by low clotting factors. A yellow tint to the skin or gums, as seen in the photo below right, is called jaundice or icterus; it's caused by a buildup of bilirubin. A diseased liver can't filter and remove the bilirubin from the blood as it should.

This Pomeranian is in the final stages of liver failure. The "pot belly" is a result of fluid accumulation in her abdomen.

the hepatobiliary tree. ALP can also be found in the bones and intestines. Young, growing dogs will often have ALP elevations due to bone growth, while older animals with bone cancer can have high ALP levels, too. Again, an elevated value of this enzyme alone does not necessarily indicate disease.

Bilirubin is a yellow pigment found inside the liver and also in red blood cells. The liver metabolizes bilirubin, and when the liver is failing, blood levels of bilirubin will increase. This is what causes the yellow tint to the skin when a dog has jaundice.

The next assessment looks at the function of the liver. This is usually done with tests for bile acids, ammonia levels, and coagulation profiles. Bile acids are secreted by the liver in response to eating. Testing must be done while fasted; a blood sample is drawn, then the patient is fed, and another sample taken one to two hours later.

The liver is essential in making clotting factors. When it begins to fail, this ability is impeded, and uncontrolled hemorrhage can occur. There are specific tests to evaluate clotting times – called prothrombin time and activated partial thromboplastin time (PT and APTT).

Ammonia is a waste product, and when the liver is failing, ammonia levels will rise. All of these function tests are usually sent to outside laboratories for evaluation.

Imaging of the liver generally includes X-ray and ultrasound. More advanced studies may be conducted with CT scan or MRI with contrast. X-rays can determine if there is liver enlargement or large liver tumors, but it cannot show any of the liver's internal architecture; ultrasound, CT, and MRI are used for this.

Samples of the liver can be taken in two ways. In a fine needle aspirate, a small needle is introduced into the liver and suction applied; then the sample is evaluated under a microscope. In a biopsy, a piece of tissue is taken via exploratory surgery or laparoscopically, and is tested with a culture and/or with a microscopic examination.

TYPES OF LIVER TROUBLE

Given the complexity of this organ's work, it shouldn't come as a surprise that there are a number of different ways that the liver can be compromised. We'll organize them by the type of problem.

Congenital problems

The blood vessels in the liver normally have a very particular arrangement. Some puppies are born with extra or aberrant blood vessels called **portosystemic shunts (PSS).** Think of the liver as a blood filter; with a PSS, much of the blood bypasses the liver.

Symptoms of a PSS develop because the liver is not metabolizing properly due to the abnormal blood flow and the buildup of waste products in the blood. These symptoms may include abnormal behavior (particularly after eating), failure to gain weight and grow, and seizure activity. Liver function tests (such as a test for bile acids) and imaging can often identify the shunt. Surgery to improve blood flow to the liver is the treatment of choice in young dogs.

Some breeds are particularly prone to PSS. These include Yorkshire Terriers, Pugs, and Miniature Schnauzers.

Portal vein hypoplasia (formerly called microvascular dysplasia) is another congenital problem that can be present at birth or develop later in life. It is very similar to a PSS, and sometimes, it can be extremely difficult to differentiate the two based on the usual liver testing. The difference is that most dogs are asymptomatic, and the abnormality is found on routine pre-anesthetic screening bloodwork or at the time of another illness. The only change may be mild elevations of liver enzymes.

Infectious and inflammatory liver ailments

Leptospirosis is an infectious disease, caused by a bacteria found in stagnant water such as ponds and puddles. It is most known for causing kidney failure in dogs, but it can also induce liver failure. The initial symptoms are vomiting, diarrhea, lethargy, fever, red, painful eyes (uveitis), and sometimes muscle pain and stiffness or cough. Illness can be severe and life-threatening.

There is a leptospirosis vaccine, but it's generally considered a "lifestyle" vaccine – meaning that it may not be appropriate for all canines. For example, dogs who have little or no access to puddles or ponds may have little risk of encountering the leptospira bacteria, making the vaccine unnecessary. But the fact that leptospirosis is zoonotic (humans can contract the disease) makes some veterinarians (including me) recommend the vaccine for *all* dogs. It's best to discuss this vaccine with your veterinarian.

Hepatitis is a general word for liver inflammation. There are several types in dogs, including infectious hepatitis and inflammatory hepatitis. **Copper storage hepatopathy** is a well-described disease in which the liver accumulates too much copper. Predisposed breeds include Labrador Retrievers, Doberman Pinschers, Bedlington Terriers, and West Highland White Terriers.

Canine adenovirus can cause an infection in the liver. Vaccination has largely eliminated this condition

although it can still occur in unvaccinated dogs.

Toxicity-induced liver trouble

The liver is especially susceptible to toxins. As a filter for the body, it metabolizes many of the substances in the blood.

Xylitol is a common sweetener found in kitchens, especially those of diabetics. It prevents wide fluctuations in insulin and glucose in humans. In dogs, however, it can cause a hefty insulin release. This drives blood sugar down, leading to hypoglycemia. The symptoms occur within 30 minutes of ingesting xylitol, and include weakness, tremoring, seizures, and coma. If a large enough dose is ingested, liver failure will occur. This can take two days to a week to manifest, so just because your dog isn't showing any immediate symptoms doesn't mean the ingestion should be ignored.

Xylitol is also included in sugar-free gums and candies, as well as some compounded medications and peanut butter. Always check for the presence of this chemical before giving your dog a new treat or compounded medication.

Sago (cycads) palm are another source of deadly liver toxins. These plants were once isolated to subtropical and tropical areas, but today, sago palms are now available almost anywhere. They are extremely poisonous to dogs, leading to death within a day to a week after ingestion. Every part of the plant is considered toxic, so these should not be kept in homes or in landscaping where dogs are present.

The initial symptoms of ingestion are rapid in onset (within minutes to a few hours) and include drooling, vomiting, diarrhea, and lethargy.

If you suspect your dog has eaten sago palm, do not wait to see if symptoms manifest. Immediate and aggressive decontamination is needed. Your veterinarian will likely induce vomiting to remove any sago palm from the stomach, give activated charcoal to prevent further absorption, and then start intravenous (IV) fluids.

Aggressive treatment is absolutely imperative. Most dogs who ingest sago will spend anywhere from a week to two in the hospital. Treatment will include IV fluids, nutritional support, antibiotics for secondary bacterial infections, and other advanced therapeutics such as fresh frozen plasma transfusions and vitamin K administration. Liver values and clotting times will be checked at least daily and maybe more often. If your dog isn't eating, a feeding tube may be placed through the nose or IV nutrition given into the catheter.

Beware the Deadly Sago Palm

Dr. Kimberly Chambers is a veterinarian in Conroe, Texas. She knew that sago palms *(Cycas revoluta)* were poisonous, and so when she moved into her beautiful new home, she had the sago palms in her yard cut down and removed.

Some time later, Dr. Chambers adopted a puppy, Theo. Last June, at four months of age, Theo was digging in the yard and – apparently – dug up and chewed some roots of the palm that were still in the ground.

Dr. Chambers didn't see this happen, but about an hour after he had been outside digging, Theo vomited in the house. The bits of the root jogged her memory; she realized it was likely sago palm roots. She induced Theo to vomit some more, and then drove quickly to the closest specialty veterinary hospital.

At first, it seemed as if Theo might have been treated fast enough. He had only mild elevations in his liver enzymes. He was sent home with liver-supportive medications and orders for Dr. Chambers to monitor him closely. But his appetite was poor. He grew, but he remained thin.

Weeks later, since he was still underweight, Dr. Chambers had Theo's liver imaged with ultrasound. With that, the damage the sago had done to Theo's liver finally came to light. Despite its ability to regenerate, the liver can withstand only so much damage. Theo's liver had marked fibrosis (replacement of healthy tissue with fibrous, non-functioning tissue). He also had some fluid in his abdomen secondary to low proteins and a "leaky" liver.

Over the next few weeks, Theo's abdomen continued to accumulate fluid. Dr. Chambers would drain his abdomen via abdominocentesis, but because of his damaged liver, the fluid always returned. One day, Theo didn't want to come out of his crate and he didn't want to eat. His gums were pale and his belly was bloated. Dr Chambers knew it was time. She and her family fed Theo brisket for dinner and breakfast (with whipped cream). And then they said goodbye to him in the most peaceful way possible.

Theo fought a tough battle, but despite early and aggressive, expert care, he died. He serves as an important reminder to keep all sago palms out of houses and yards where dogs live.

The prognosis for survival, even with treatment, is only about 50 percent.

Exposure to the toxins in **blue-green algae** can be fatal within minutes. Blue-green algae (more properly called cyanobacteria) can be found in freshwater lakes, ponds, and brackish water but also in less obvious places, such as aquariums. Algae can be present throughout the year, but is found in higher concentrations in warmer months. Not all blue-green algae makes toxins, but you cannot determine that by looking. Thus, never allow dogs to swim in water with algal blooms.

Cyanobacteria can produce two primary types of toxins: anatoxins, which cause sudden death due to respiratory paralysis, and microcystins, which lead to liver failure. Symptoms of microcystin toxicity are similar to those of other liver toxins and include vomiting, diarrhea, lethargy, and lack of appetite. If blue-green algae ingestion is suspected, do not delay in seeking treatment. As with other toxins, it will center on supportive care, as there is no antidote.

Medications are a common source of deadly liver toxins. Several medications that are frequently used by humans have been implicated in canine liver failure. **Acetaminophen** can be used at safe levels in dogs. It is often used in oncology when combined with opioid medications to control cancer pain. Like any substance, the dose makes the poison. At high enough doses, acetaminophen can cause liver failure.

Carprofen, a common non-steroidal anti-inflammatory drug (NSAID) used for the treatment of pain, has been implicated in liver failure. Why some dogs develop this rare problem is unknown. Overall, carprofen is an extremely safe choice for pain control but, rarely, a dog will develop problems. This may be more common in Labrador Retrievers for unknown reasons.

Because of its reliance on the liver for metabolism, **phenobarbital** can lead to liver failure in some cases. This is a ubiquitous medication in veterinary medicine, used in the control of seizures. Dogs on phenobarbital will need monitoring of liver values, and if indications of hepatic damage occur, may be switched to a newer anti-seizure medication such as Keppra or zonisamide.

Acquired liver problems

Some liver ailments are acquired over time, not from an acute insult. **Vacuolar hepatopathy** is an age-related condition characterized by liver cells (called hepatocytes) that appear swollen and foamy under a microscope. Liver cells accumulate damage over a lifetime; when stressed, they respond by swelling and developing vacuoles – little fluid-filled cysts inside the liver cells themselves. This often results in an enlargement of the liver. This non-specific change can be insignificant or linked to a host of illnesses.

Some of the most common causes of vacuolar hepatopathy are long-term steroid use or chronic steroid overproduction (as in Cushing's disease) and the use of phenobarbital for seizure control. The findings on bloodwork can be nonspecific but generally include an elevated ALP. If your dog is otherwise healthy and asymptomatic, your veterinarian may not be alarmed by this test result. However, if there are symptoms of illness, more testing is indicated.

The liver does develop **cancers.** The most common are **hepatic adenocarcinoma** and **hemangiosarcoma.** There may be no symptoms as liver cancer develops. Sometimes, a large liver tumor is found on routine examination or through senior bloodwork. This is the ideal situation. If found incidentally, many liver tumors can be successfully removed. Hepatic adenocarcinomas are often completely cured by removal, as they are slow to metastasize.

Hemangiosarcomas, in contrast, are much more aggressive tumors. They grow silently and then rupture. Often, they are discovered when a previously healthy, older dog collapses suddenly. Surgery will address the hemorrhage and remove the source of bleeding, but by the time they are discovered, these tumors have already spread. Surgery alone can yield up to three months of survival time, while adding chemotherapy can increase survival to six months to one year.

Catherine Ashe graduated the University of Tennessee College of Veterinary Medicine in 2008. Dr. Ashe practiced ER medicine for nine years and now works as a relief veterinarian in Asheville, North Carolina,

Liver support

There are many medications that your veterinarian may use to treat your dog's liver disease. But there are also several good over-the-counter supplements that can help support a damaged and healing liver.

Denamarin and vitamin E have antioxidant effects in the liver, as well as some anti-inflammatory properties. Denamarin is a canine-specific product containing silymarin, an extract of milk thistle, which offers particularly good anti-inflammatory action. Vitamin E is a fat-soluble vitamin found in high concentrations within the liver. Both supplements can be used in addition to conventional medical treatments to support a damaged liver.

Turmeric has recently received increased attention for its anti-inflammatory effects in both human and veterinary medicine. While there are no large, controlled studies evaluating its efficacy, it is safe for use in dogs. A word of caution: Don't buy from sketchy online sources or administer human products. Seek out a reputable veterinary product such as CurcuVet made by ThorneVet (available from Amazon.com and many veterinarians). Internal quality control is essential in finding a good product.

BY BARBARA DOBBINS

CONSUMER ALERT

Bone Cancer Vaccine

University of Missouri veterinary oncologists partner with ELIAS Animal Health to study a promising immunotherapeutic treatment for canine osteosarcoma.

"Immunotherapy offers hope for cures, while this is rare in patients receiving chemotherapy," says the University of Missouri's Dr. Jeffrey Bryan. "The process is now available commercially, and we will be following those dogs that receive ECI treatment to confirm the positive outcome."

Osteosarcoma is the most common type of bone tumor diagnosed in dogs, affecting an estimated 10,000 dogs each year in the U.S. alone. Too many owners are aware that this disease can be extremely aggressive with a poor prognosis.

In October 2018 at the Veterinary Cancer Society annual conference, researchers from the University of Missouri presented their initial findings of a clinical trial of a new patient-specific targeted treatment: a vaccine created from the dog's own tumor that harnesses the power of the dog's immune system to eliminate the cancer.

The team partnered with ELIAS Animal Health to evaluate ELIAS' Cancer Immunotherapy (ECI). Fifteen privately owned dogs (not laboratory animals) with osteosarcoma were enrolled in the study. The 10 dogs who completed the therapy (consisting of the ECI vaccine and protocol) experienced extended survival times – a median of 415 days of remission. This greatly exceeds the median remission time reported for osteosarcoma patients receiving amputation and chemotherapy (about eight to 12 months). Half of the dogs who received all aspects of the therapy are still alive, without disease, well over a year and a half later.

Further, the study found the treatment to be safe and tolerable. Chemotherapy can have toxic side effects and destroy healthy cells, so it's really exciting that "it's the first time that dogs with osteosarcoma have experienced prolonged survival without receiving chemotherapy in a clinical trial," says Jeffrey M. Bryan, DVM, PhD, DACVIM Oncology, professor of oncology at MU's College of Veterinary Medicine and director of the school's Comparative Oncology Radiobiology and Epigenetics Laboratory.

HOW IT WORKS

The treatment involves a two-part protocol that takes about 60 days. Surgical removal of the patient's tumor by a veterinarian is the first step. The cancerous tissue is sent to the ELIAS lab where a patient-specific vaccine is produced and returned to the vet. The vaccines are administered on a weekly basis to activate the dog's immune system T cells to recognize his cancer.

The second step begins two weeks after the first step is complete. Using apheresis (a procedure that separates blood cells), a specialty center harvests the cancer-specific T cells generated by the vaccine from the dog. These T cells are sent to ELIAS, where they undergo a proprietary process to produce a tumor-specific population of activated cancer-killing T cells. These are, in turn, sent back to the veterinarian for administration to the dog.

The ELIAS process activates the dog's lymphocytes, priming them to identify, attack, and destroy the dog's unique tumor cells. This immunotherapeutic approach targets specific cancer cells; it does not destroy other rapidly dividing cells like chemotherapy does.

While the vaccine is not a preventative and is therapeutic only after diagnosis, "the body also develops a memory of immune targets, which may lead to long-term control of tumors," Dr. Bryan says. This could mean significant advances in survival and disease-free intervals.

The treatment is available through ELIAS Animal Health. "The collection of the tissue and administration of the vaccine and T-cell infusion could be performed by any veterinarian trained in the procedures," Dr. Bryan says. For more information about ECI and whether your dog is a candidate for treatment, see EliasAnimalHealth.com.

Having lost two dogs to cancer, long-time WDJ contributor Barbara Dobbins follows canine cancer research news closely.

BY KYLE GRUSLING, DVM

HEALTH

A Crucial Repair

Which surgery will best fix your dog's cranial cruciate ligament tear? Here are the factors to consider in the decision.

When your dog comes in limping from a play session, a lot of thoughts go through your head. Is a trip to the vet needed? What can I give to help? How did this happen?!

Last month, we covered one of the most common orthopedic injuries in dogs – the cranial cruciate ligament tear. This month, we're going to talk about how to fix it.

FOUR MOST COMMON OPTIONS

The most common options discussed after the diagnosis of a cruciate ligament tear are:

- **Braces**
- **Lateral suture**
- **Tibial plateau leveling osteotomy (TPLO surgery)**
- **Tibial tuberosity advancement (TTA surgery)**

There are other procedures out there, but there's a reason these are the four most common treatments offered.

The truth is, we do not have a perfect solution. Research is constantly evolving and we are still in search of the perfect fix. In humans, a synthetic or biologic ligament is placed where the damaged ligament used to sit. This was tried in dogs, but the outcomes were never good. The replacement ligaments were just not well tolerated. Consequently, something different had to be done.

BRACE YOURSELF

Bracing the stifle is no small task. It's an incredibly dynamic joint that provides spring, shock absorption, and the ability to turn on a dime. The key to a brace is stability and fit.

Braces for a cruciate tear may cost $1,000 or more. There are inexpensive options, but bargains are not a great idea when it comes to your dog's lifelong comfort.

Ideally, a knee brace is custom-fit for your dog, sometimes involving a mold made of his joint. This ensures good fit and appropriate flex. Remember, the knee still needs to bend to be useful! A brace cannot provide complete stability, but it can alleviate some of the pain from a joint that is moving improperly.

The two canine-brace companies most often recommended by vets are OrthoPets (OrthoPets.com) and Hero Braces (GoHeroGo.com). It's important to remember that a brace does not fix a cruciate tear, it simply helps to stabilize the knee. Success

The incision for a TPLO is impressively large, but with scrupulous control of the dog's activity in the days after surgery, most dogs recover quickly – perhaps because they are no longer in pain from their ligament injuries.

depends on selecting the right brace, a good physical therapy program, and a commitment to refitting as needed.

A LATERAL MOVE

The **lateral suture procedure** (also known as the **extracapsular repair**) is the closest thing to the repair done in humans. This does *not* make it the best choice. This is one of the first surgeries developed when it was determined that repairing the ligament directly was not a good option.

In this procedure, a heavy gauge suture is placed outside of the knee joint in the same direction that the cranial cruciate ligament used to run. A hole is drilled through the front of the tibia (the lower leg bone). The suture is passed through this hole and then up and around a small bone, called a fabella, behind the femur (the upper leg bone). The creates a loop that is similar in location and direction to the cranial cruciate ligament, but *outside* of the joint.

This is an important distinction. Because this surgery does not involve opening the joint, the meniscus (the cartilage cushion that provides shock absorption in a joint) is not always evaluated for tears. The jury's still out on this procedure, but most surgeons feel a torn meniscus can cause persistent pain.

Ultimately, the goal of this surgery is *not* to repair the cruciate ligament, but rather to direct the growth of scar tissue. Basically, the suture provides a scaffold for scar tissue to form along the same path as the torn cruciate ligament, thereby stabilizing the joint. Over time, this suture will break down. It's not meant to last forever, just long enough for enough scar tissue to form.

This procedure is quick, relatively inexpensive (typically $1,500 to $2,000) compared to other surgical repairs, and can often be performed by your regular veterinarian. However, it's not for every case.

If the suture breaks before sufficient scar tissue is laid down to stabilize the joint, the entire surgery becomes ineffective. If a dog is too big or too active, you can almost guarantee failure. Most veterinarians recommend this surgery only for dogs who are less than 40 pounds or dogs who are happy being couch potatoes. Having said that, finances are an important part of any veterinary decision, and this is definitely the least expensive surgical option.

LEVELING THE FIELD

The **tibial plateau leveling osteotomy (TPLO)** and the **tibial tuberosity advancement (TTA)** procedures are both aimed at mechanically altering the joint to make the cranial cruciate ligament unnecessary. Both surgeries require the surgeon to open the joint, so the meniscus can be evaluated for tears. These are somewhat complicated surgeries and involve a complex understanding of the knee joint, but we'll cover the basics.

In last month's article, "Dogs' Knees' Needs," I described the structure of the canine stifle joint and how it differs from the human knee. The slope to the tibia is one of the biggest contributing factors to this injury. In the TPLO surgery, this slope is taken out of play. A circular cut is made in the top of the tibia and the slope is rotated into a neutral position. A plate is used to secure the bone in its new position. This creates a knee joint that closely resembles the human knee joint. Without that slope, the cranial cruciate ligament is no longer as important; the knee is stable without it. This surgery is typically performed only by boarded surgeons and costs around $4,000.

This procedure has the fastest reported return to normal activity, meaning dogs who get this surgery are able to return to a comfortable life faster than any other procedure out there. However, it's not without drawbacks.

Aside from the cost, there is risk of failure. When a dog is too active immediately after surgery, the plate can break or move. Failure of the plate can be catastrophic. Recovery is an eight-week process, involving first crate rest, then physical therapy, and a gradual increase back to running in the yard.

Similar to the TPLO, the TTA changes the forces in the knee joint to render the cranial cruciate ligament unnecessary. In this case, a cut is made in the front of the tibia. This piece of bone is moved forward, which pulls on the patellar tendon and neutralizes the backward motion of the femur during weightbearing. This lets the dog move comfortably without an intact cruciate ligament.

In this case, a specialized device consisting of a "cage" and a "fork"

Don't Self-Medicate

When your dog hurts, you may tempted to look in the medicine cabinet for something to ease her pain. But there are very few over-the-counter human medications that you can safely give your dog.

Many years ago, we used aspirin for pain in dogs. However, studies have shown that the pain control offered by aspirin is pretty minimal and it has serious side effects. Aspirin increases bleeding tendencies by inhibiting platelets, a key component in clotting blood. Aspirin use also limits the options that your vet has to treat your dog's pain because of how it interacts with other medications.

Ibuprofen should never be given to dogs as it can cause irreversible liver damage and can even be fatal. Tylenol (acetaminophen) has its place in veterinary medicine, but only under the guidance of a veterinarian because, with certain other diseases, it can be very dangerous.

If your dog is in pain, resist the urge to toss her a human pain-killer. Your veterinarian has an arsenal of medications that are safe for dogs and will work much better than what you have at home.

is used to secure the bone in its new position. Over time, it heals fully and is very stable. If it were to fail, a TPLO procedure can still be performed.

The recovery time for these two surgeries is similar, but dogs typically take a little longer to be fully comfortable after the TTA surgery. The cost is a bit less than a TPLO, but it is also an expensive procedure – usually in the $3,000 to $3,500 range. It is typically performed only by boarded surgeons, but there are some general practitioners who are comfortable with it and have the necessary equipment.

DECISION TIME

Again, there is no perfect solution. Every single option is valid for a different circumstance. The important thing is figuring out which solution works for *your* dog. Older, smaller dogs who are less active often do great with a lateral suture repair! A two-year-old Lab with bad hips needs a bit more stability in the knee, so a plate repair (either the TPLO or TTA) would be a better option.

Your location might make the decision; most surgeons learn one procedure and stick with it, so both might not be offered near you. The two procedures have similar success rates and are both recommended for larger, more active dogs.

Bracing and what's often referrred to as "conservative management" is simply *not* as successful as the surgical options, but when surgery is not an option, it's better than nothing.

With time, the limp from a cruciate tear will improve without *any* intervention. Scar tissue will form and the joint will be useable, but the arthritis that will develop will limit the dog's quality of life. This is not an emergency injury, but the sooner it's addressed, the less arthritis and the better the long-term outcome.

At the risk of sounding like a broken record, talk with your veterinarian! Be up front about financial constraints, recovery concerns, and long-term goals so that you can come up with a plan that's right for you *and* your four-legged friend.

Kyle Grusling, DVM, practiced emergency medicine for three years before switching to a general practice, Northland Animal Hospital in Rockford, MI.

If Your Puppy Is a Lemon, Make Lemonade!

Shortly after our dog Agnes was born, she was considered the pick of the litter for Paws with a Cause, a local organization that trains service dogs. However, at her very first veterinary appointment at just eight weeks old, she was found to have hip dysplasia and "trick knees" – which, in her case, had her kneecaps slipping to the outside of the joint.

Because of these problems, she couldn't be a service dog and she couldn't be adopted to the public. She needed thousands of dollars in surgery to fix her back legs! Euthanasia was being considered for this little "lemon" of a puppy. In a lucky twist of fate, she found her way to our doorstep, just when we were looking for a new companion for our family.

Agnes underwent three major surgeries at just four months old. A local veterinary surgeon offered her services pro bono, using Agnes as a teaching case to learn a new procedure. Agnes' pelvis and both of her knees needed corrective procedures. Fortunately, her recovery was smooth and she grew into a lovely and beloved dog.

Shortly after she turned three years old, Agnes came up lame after playing with a puppy. Due to her history, we were immediately worried that it was one of her hips, but her limp was intermittent and it didn't seem painful when her hips were manipulated. It gradually became clear that one of her knees was the problem and she was diagnosed with a partial tear of her left cranial cruciate ligament.

For the next six weeks, Agnes was placed on strict cage rest and a physical therapy program to try to keep her injury from progressing. But three months later, when she was finally allowed to play, she immediately came up three-legged lame; she had torn her ligament completely.

We took her right away to a board-certified surgeon who assessed her knees and we came up with a plan. She underwent a TPLO procedure the very next day to repair her joint yet again. Because of Agnes' other orthopedic problems, her young age, and her generally wild demeanor, we decided that a TPLO was the best option for a good long-term outcome. This surgery stabilized her joint and decreased her risk of arthritis down the road.

A side x-ray view of Agnes' knee after TPLO surgery. The plate on her tibia holds her bone in its new position. The sharp point on the front of her tibia will remodel over the next few years, causing no trouble in the meantime.

Her rehab seemed far longer than the eight weeks it actually was, especially since she felt comfortable after just a day post-surgery! But the surgery was worth every penny and the rehab was worth every minute of activity restriction.

Now, two years later, she's back to her old antics and shows no sign of lingering discomfort! – Kyle Grusling, DVM

BY SASSAFRAS LOWREY

CASE HISTORY

Both Knees Now

How a fit, young Newfoundland injured both knees and had two TPLO surgeries at once – with great success.

Sirius suffered her first cranial cruciate ligament injury before her first birthday. Because her growth plates were not yet closed, her owners used conservative managment to help her recover from that injury.

At just eight months old, Sirius, my Newfoundland, partially tore the cranial cruciate ligament (CrCL) in her right knee. It was a shock to me, as she came from an excellent breeder, and because my partner and I had been very cautious about our puppy's activity levels and kept her from doing anything even remotely high-impact.

Because of her age and the fact that her growth plates were not yet closed, we decided the best option for the time being was conservative management, rather than surgery. Sirius healed well for a time and was medically cleared to return to low-impact sport training.

OOPS, SHE DID IT AGAIN

This past summer, at 20 months old, Sirius began limping again. Just as before, there was no precipitating incident, and we were being assiduous in maintaining her low-impact lifestyle; we always lifted her in and out of cars, etc. Yet diagnostics showed that she had – *again* – partially torn her right cranial cruciate ligament *and* significantly torn her left CrCL.

This time, thankfully, her growth plates were closed, making Sirius an ideal candidate for surgery. We began meeting with and interviewing veterinary surgeons.

At the time, we were living in a multi-story Brooklyn townhouse. For some time, my partner and I had been talking about a move to the West Coast; suddenly, this seemed like the perfect time to make the move. We realized that if we moved first and Sirius had the surgery there, she could have an easier rehabilitation than would be possible in a home with as many stairs as our townhouse. That's how we came to spend a couple of weeks sleeping on an air mattress and living downstairs (since Sirius couldn't do stairs) as we packed up our life and put our house on the market. Then we drove cross-country with our three dogs (and three cats!) to our new single-story home in Portland, Oregon.

SURGERY PLAN

As we learned in our independent research and from meeting with multiple veterinary surgeons, the TPLO surgery has become the gold-standard treatment for this kind of knee injury, especially in very large, strong, young, athletic dogs. While waiting for Sirius' growth plates to close, we saw firsthand how conservative management worked – and then didn't. We were looking for a treatment option that gave Sirius the best chance at the kind of fun and normal life she deserved, one that would allow her to return to the activities and sports training that she loved.

We had a surgical consultation scheduled for right after we arrived in Portland, and Sirius was scheduled to go in for surgery a few days later.

Sirius had bilateral TPLO – both knees operated on at the same time. It was determined at the time of surgery that Sirius had one fully torn knee (left) and one partially torn knee (right, with scar tissue from the months of conservative management we had to do when she was too young for surgery).

In addition, the surgeon recommended one more procedure: a meniscus release in both knees. There are actually two menisci in each knee, and in some cases, they can become "caught" on protrusions from the tibia within the knee joint, causing further pain and injury. In the meniscus-release procedure, some connective tissue is severed to divide the menisci and ensure that they can no longer get caught. The procedure decreases the chances of a subsequent meniscal tear, so we told the surgeon to go ahead.

Therapists adjust the water level in the underwater treadmill so that the dog floats to the desired degree, depending on the stage of her rehabilitation. This enables her to exercise and increase her range of motion without bearing too much weight.

RECOVER AND REHAB

I have to say – recovery was no joke. My partner and I both work from home, so we were able to arrange our schedules in order to provide Sirius with around-the-clock care and supervision when she came home from the hospital; this started the day after surgery. It was incredible to see how she was bearing weight already! We didn't leave Sirius alone for a *minute* until the staples came out, 16 days after surgery.

The day after the staples were removed, we began weekly visits with a veterinary physical therapist. Sirius' treatments included laser therapy, time on an underwater treadmill, and guided structured exercise. The latter was essential, as it also gave us a tailored daily exercise plan to work on at home, as well as a schedule for daily walks that increased in length and intensity under the guidance of her therapist.

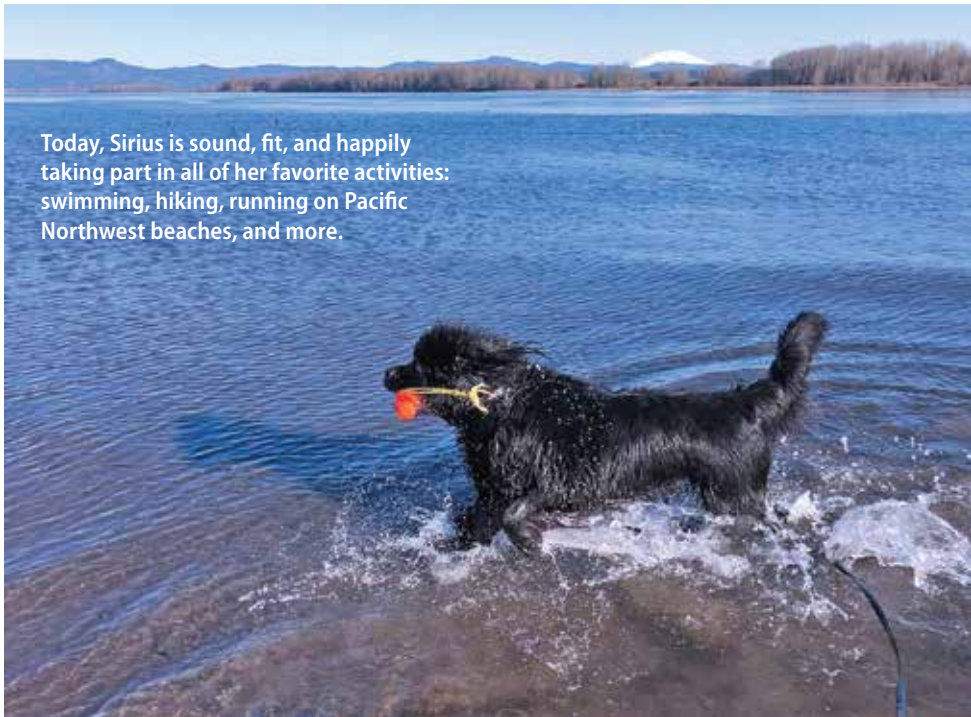
Sirius had her final surgical recheck at eight weeks post-surgery and had new x-rays taken. Her knees had healed beautifully. In total, we had done eight sessions with a physical therapist before Sirius graduated and was fully cleared to resume all normal activities and all sport training.

Prior to her knee injuries, Sirius was swimming regularly. To be extra safe, we booked a consultation with a veterinary swim specialist at a dog pool/swim center, to ensure that she was still a strong and collected swimmer. It was determined that surgery had no impact on her swim style and that it was safe for her to resume regular swimming and begin water work training next season.

At nine weeks post-surgery, Sirius returned to low-impact Rally obedience training; at 13 weeks post-surgery she competed in her first Rally trial.

Today, at not quite five months post-surgery, Sirius' quality of life is beyond what I could have imagined. She completed her Champion Trick Dog Title, has returned to Rally training, enjoys hiking and visiting the beach, walks for more than an hour a day, runs in the backyard with my other dogs, swims in rivers, and basically is loving life in the Pacific Northwest. TPLO surgery gave back my young, exuberant, athletic dog the ability to live life to its fullest.

Sassafras Lowrey is an award-winning author and Certified Trick Dog Instructor. Sassafras' forthcoming books include Tricks in the City: For Daring Dogs and the Humans That Love Them, Healing/Heeling, *and* Bedtime Stories for Rescue Dogs: William to the Rescue. *See page 24 for more information.*



Today, Sirius is sound, fit, and happily taking part in all of her favorite activities: swimming, hiking, running on Pacific Northwest beaches, and more.

Product Information

Examples of and purchasing information for products discussed in "Play With Your Food," pages 8-11

Information in red type corresponds to products pictured in article.

Reliable online sellers of these products include amazon.com, chewy.com, cleanrun.com, jjdog.com, petco.com, petsmart.com.

SNUFFLE MATS

Darkyazi Snuffle Mat/Nosework Blanket, $31
Amazon.com

Paw5's Wooly Snuffle Mat, $40
paw5.us, (215) 383-1654

Petvins Dog Feeding Snuffle Mat, $37
Amazon.com
SNiFFiz Smelly Matty, $55
shop.akc.org

Good instructions for a make-it-yourself snuffle mat: thehonestkitchen.com/blog/diy-make-your-dog-or-cat-a-snuffle-matt/

FILL WITH FOOD TO LICK AND CHEW

Busy Buddy's Twist'n Treat, $5-$14, depending on size. Available in pet supply stores and online, or from its maker: store.petsafe.net, (866) 738-4379

Idepet Dog Toy Ball, $9
Amazon.com

Kong, $7-$14, depending on size.
See the entire line of classic Kong toys at kongcompany.com. Available for purchase in pet supply stores everywhere and online.

Kong Genius Leo Food Dispensing Dog Toy, $5-$8, depending on size. Connect several to add to difficulty. Available in pet supply stores and online.

KIBBLE-DRIBBLING TOYS

Busy Buddy's Kibble Nibble, $11-$16, depending on size. Available in pet supply stores and online, or from its maker: store.petsafe.net, (866) 738-4379

Omega Paw's Tricky Treat Ball, $5-$8, depending on size. Available in pet supply stores and online.

Our Pets Buster Cube , $11-$12, depending on size. Available in pet supply stores and online.

SLOW-FEEDER BOWLS

Kyjen Slo-Bowl Feeder, $15
Available in pet supply stores and online.

Neater Pets' Slow Feeder, $27
neaterpets.com, (877) 917-7387

Outward Hound's Slo Bowls, $10-$20
Available in pet supply stores and online, as well as from their maker, outwardhound.com, (800) 477-5735

QT Dog's Brake-Fast Stainless Steel Dog Bowl, $10-$23, depending on size. Available in pet supply stores and online.

LICKY-STICKY THINGS

Aquapaw Slow Treater Treat Dispensing Mat, $11. Available from Amazon.com and from its maker: aquapaw.com

Chase 'N Chomp's Sticky Bone, $15
Amazon.com

Helpcook Dog Lick Pad, $13
Amazon.com

Hyper Pet's Lickimat Dog Mat, $6-$10
Amazon.com

Hyper Pet's Lickimat Dog Soother, $5 (for creamier treats)
Amazon.com

INTERACTIVE TOYS AND DOG "PUZZLES"

Nina Ottosson's dog puzzles, $10-$30
See complete line of products available at nina-ottosson.com. Available in pet supply stores and online.

Trixie Pet Products' Dog Activity Strategy Games, $10-$30. See complete line of products available at trixie.de. Available in pet supply stores and online.

ELECTRONIC TREAT DISPENSERS

Furbo Dog Camera, $199
Dispenses treats via phone app; also takes video and allows two-way audio.
shopus.furbo.com

PetCube Bites, $249
HD pet camera that allows you to monitor and talk to your dog and fling treats via app.
petcube.com, (888) 447-2522

PetSafe Treat & Train Remote Reward Dog Trainer, $120
Dispenses treats via remote control.
Amazon.com

Ready Treat Remote Treat Dispenser, $50
Dispenses only one serving of treats via remote control before needing to be reloaded.
Available from jjdog.com

Smart Animal Training's Pet Tutor, $299
Can be operated with remote control as well as phone app; can be programmed to release food randomly or at set intervals.
smartanimaltraining.com, (877) 250-2694

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Sassafras Lowrey, CTDI, is the author of the forthcoming books *Tricks in the City: For Daring Dogs and the Humans That Love Them; Healing/Heeling*; and *Bedtime Stories For Rescue Dogs: William to the Rescue* with illustrator Lili Chin. You can find all of her books for pre-order at Amazon.com and her website SassafrasLowrey.com

WDJ Training Editor Pat Miller is author of many books on force-free, pain-free, fear-free training, including:

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