



## Giardia: For Shelter Staff and Volunteers Video Transcript

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*Giardia* is a hearty organism that can cause unrelenting issues in the animal shelter. This talk, presented at the 2013 ASPCA/Maddie's<sup>®</sup> Shelter Medicine Conference by Dr. Teva Hoshizaki, Maddie's<sup>®</sup> Shelter Medicine Program Intern at Cornell University, will review best practices in managing, treating and preventing these organisms in your population.

*Dr. Hoshizaki:*            *[It is]* really a great honor to be here. Thank you for having me. I'm really excited to talk about actually one of my favorite parasites. When they said, "What do you want to do for the conference?" I was like, "*Giardia*. That's great!" So, I'll try to control my enthusiasm. I know you guys just had a big lunch, so hopefully I can give you some of my zest. Without further ado – we've got a lot to cover – let's take a look at *Giardia: For Shelter Staff and Veterinarians*.

First of all, when I say the word *Giardia* what do you think of? What is the clinical picture? What are you thinking of for humans or animals?

*Audience:*                Diarrhea.

*Dr. Hoshizaki:*            I'm sorry?

*Audience:*                Diarrhea. Diarrhea.

Dr. Hoshizaki:

Oh, yes. Yes. I'm like "Diarrhea. Absolutely." But, of course, there's more to it than just the clinical picture. What is *Giardia* in a grander scheme? Think about that, and I'm going to ask the question again in 20 minutes. Hopefully we will have clarified some issues.

*Giardia* is a protozoan parasite that lives in the small intestine and you can see here [the] little teardrop shaped protozoa on the slide. As you guys already know, or many of you know, diarrhea is what we think of – so gastrointestinal disease in dogs, cats and humans. This is a zoonotic disease, which affects humans and other animals. I just googled "*Giardia* Outbreak," and look, I got one really close to here, really recently. It's an important zoonotic disease that affects humans and you are going to see it in the news. Of course, in the shelter setting, where we're thinking more about cats and dogs, unfortunately, it is a very difficult disease to diagnose and to treat in that setting.

We have two varieties of *Giardia*, which we are going to think about.

We're going to think about the adults. These are the protozoa, which are in the small intestine. They are the ones who are causing disease. One of the reasons why they are my favorite is because I think they look like little smiley faces. I don't know. I'm not great with all of the other eggs, but if I see a *Giardia* I know what it is. It's smiling right back at me.

The other form of *Giardia* we think about is the cyst. These are “eggs,” which are in the environment, and these are what are infecting the other animals in the shelter. Coincidentally, I kind of also think they look like little smiley faces. I don’t know if anyone else sees that.

In order to treat *Giardia* effectively in the shelter, we need to know a little bit about its life cycle. Very simplistically, we begin with a cyst in the environment. It’s going to infect our host, which is our cat. One way or another, this cat is going to ingest the cyst and become infected. Once inside the cat, we are going to have the cyst mature into the adult protozoa and it’s going to make little friends. We going to cause disease and we’re going to keep multiplying and producing more *Giardia*. At a certain point, we’re going to start producing more cysts. They’re going to start reproducing, and they’re going to go out in the feces, in our diarrhea. So these cysts are going out, back into the environment, and they’re going to be able to infect more animals.

As we’ve already mentioned, transmission is primarily what we call fecal-oral, or poop-to-mouth in laymen’s terms. Somehow these animals are eating things, which are contaminated with feces. This can be through food, through water sources, and very importantly, in the environment. I have a picture, there, of some puppies out in a play yard. They are going to have cysts in the dirt. It’s going to be on the wire. It’s going to be on

all the food bowls, etcetera, and it's going to be on the equipment. If we're moving things between cages that could possibly be contaminated, that's another great way to spread your cysts.

Also shown in this picture very well is [contamination] through fur and grooming. The cysts come out in the diarrhea. They're going to stay on the back ends. If dogs are walking in it, it is going to be on their paws. If the cat goes around grooming itself, it is going to be licking up those cysts and re-infecting itself.

As I mentioned, *Giardia* is a potentially zoonotic disease, so it is important for us to think about ourselves and the staff members. The main species of *Giardia* that we're talking about today is *Giardia duodenalis*, and it has several sub-groups, which are called assemblages. Different ones have different zoonotic potentials. Some infect humans and some do not. A and B assemblages are the ones which can affect animals, cats, dogs, wildlife and livestock, etcetera. These are the ones that we're worried about to potentially cause disease in humans. Assemblages C and D are specific to dogs, and F is specific to cats. These are ones we're not so worried about.

Now the question is, [if] we have an animal with *Giardia* how do we know if this is going to be a zoonotic issue in our shelter? Unfortunately,

the answer is [that] we don't know, because we only can find out what assemblage an animal has if we do DNA testing at the laboratory. This is something which is expensive and time consuming. Most shelters are not going to be doing this on a routine basis. It's just the reality.

So the risk – and I've looked at a few papers on the subject. It looks to be [that] maybe half [of] animals are carrying potentially zoonotic forms of *Giardia*. Whether or not it actually goes on to infect humans is a different issue. Some studies have shown that there actually may be a lot of animals – your pet cats and dogs could be holding a zoonotic form of *Giardia*.

Going on for a bit more, [regarding] studies in the United States, there are a couple of surveys looking at pet cats and dogs and the prevalence or how common the disease is. [They report that it] is around four or five percent.

Fast forwarding to shelters, we can see that the prevalence is a lot greater. Same thing for kennels and catteries. Animals housed in group conditions with issues of hygiene and sanitation, obviously we're going to have more disease. But of course, it's going to vary where your shelter is. What are the ages of the animals that are infected? What are your protocols and your husbandry procedures for your shelter? That is really going to impact how much disease you have.

A couple of quick risk factors for giardia infection. We most commonly see it in young animals. These are animals under one year of age. In adults, it's less common, because we think they get an acquired immunity. They already have antibodies and they're able to fight off the *Giardia*. So, we're really looking at young animals for this disease.

The presence of other diseases. Quite often in our shelters we see young animals that have a variety of parasites – you know, roundworms, other protozoa, etcetera – and these are going to make your clinical disease much worse. It's not just the *Giardia* which is causing them to have diarrhea.

Very importantly with *Giardia* [it] is a seasonal pattern. When it's wet, rainy and cold [in] autumn and winter, that is when we're going to see more disease, because the cysts live happily in puddles and in wet environments. They are not going to be killed as easily.

Clinical signs. You guys already nailed it on the head. We're thinking about diarrhea, inappetence or anorexia, weight loss or a kitten that's not growing so well. These are all classic, clinical signs. We also can see vomiting, but it is less common. What I need to draw your attention to, which is very important, is [that] many animals with *Giardia* have no clinical signs. These animals are asymptomatic. They are infected and

they are potentially shedding and contaminating the environment, but we do not know just by looking at them.

Now that we know a little bit about *Giardia*, we need to go on the man hunt. How are we going to find it? The classic way for looking for *Giardia* is through a microscope of fecal samples. We need to do our examination with a special zinc sulfate flotation, which is not the normal way we do flotations if any of you have been involved in doing a little microscopy in your shelter. It's not the normal way we look for parasite eggs. It's a special solution.

The cysts are very small. They can look like yeast and are very delicate, which is why we need the special solution. Otherwise, we might not be able to find them. Basically, we need experienced personnel to look at these slides. Not just anyone can [take] a fecal sample to the microscope and find *Giardia*.

The other really important point I need to labor is that even if we go and get the sample from the animal that's sick, they may not have cysts in the feces at that particular moment. We need to go and get another sample and another sample. We recommend at least three samples over the course of several days, so we're screening multiple times to increase our sensitivity and likelihood that we will find one of those cysts.

Here's actually quite an unusual slide, now that I'm thinking about it – the trophozoite, which is a fancy word for adult *Giardia*, and one of the cysts. Usually, we are just looking for the cysts on the slide, because the adults don't survive well in the environment. It's really the cysts that we're concerned with. That just gives you an idea what they look like. If you've ever looked for other parasites under the microscope, you might recognize some of these eggs. We have the roundworm, the whipworm and the hookworm, [which is] massive compared to the size of a *Giardia* cyst. If you don't know what *Giardia* looks like, if you're not looking for it, you can see how easy it would be to miss [it] on a routine examination.

What other options do we have for diagnosis, since clearly, looking [for it] on the microscope is maybe not the best solution for everyone? Luckily, we have the magic SNAP test and I am sure most of your shelters have used SNAP tests. It is just like all of the other SNAP tests we use. It is looking for a special protein in the feces that's going to be present whether or not the animal is shedding cysts. That's really great for us. It's much more sensitive. We are more likely to get a good result using SNAP tests.

There are other lab tests available. There are amino assays and the PCRs, but for most shelters what we're really going to be dealing with is the



microscope and the SNAP test. Remember, in the back of your mind, there are other options.

Now we diagnosed our animal with *Giardia*. Now what are we going to do? We're going to treat it. The first question we have to ask is "Who are we treating?" If we have an animal, which is clinically ill, we SNAP them. We get a positive. Yes, we're going to treat them. What if we have done a fecal and we found *Giardia*, but they're not sick? Are we still going to treat them? If you have five kittens in a cage together and one of them comes up positive with *Giardia* are we going to treat all the kittens in that cage? I see some nodding in the back. Very good, alright. What I really want to labor is that our treatment is aimed to resolve the diarrhea. We want the animal clinically healthy so we can get them out to adoption or just out of the shelter. We don't necessarily want to make them SNAP negative. We're not necessarily going to get rid of the *Giardia*, and that's something really important to keep in mind.

[My] favorite choice of drug at the moment is fenbendazole, or you may know it Panacur<sup>®</sup>, which works in cats and dogs. Easy. Give it once a day for five days. Pretty good results to resolve clinical signs, lessen the diarrhea and get rid of the *Giardia*.

Another option, which some people have been experimenting with is febantel combination products, also known as Drontal<sup>®</sup> Plus, which is licensed in dogs. Some people have been experimenting with its use in cats, and there has been some success.

Another popular drug that people use for *Giardia* is metronidazole. It's gone out of fashion recently because high doses can cause neurological signs, can cause birth defects and shouldn't be given to nursing mothers. Of course, *Giardia* can become resistant to metronidazole, so you can see how that would be a problem. [With] resistant *Giardia*, people keep increasing the dose, and suddenly you have all these adverse effects.

Now that we've done our drug protocol, we need to focus on the rest of the animals and the rest of the shelter. Unfortunately, this means bathing our cats. We need to prevent re-infection. All the cysts that are stuck in the fur, we need to get them out. We've got to wash our cats and dogs. We have to clip them if they're going to be matted or getting really dirty in their hind end. We need to clean the environment, so whatever cage they're in we have to make sure that we are going to move them to a clean environment. We are going to move them out of the space where they were infected with *Giardia*, where all the cysts are in the environment. We're going to move them into a clean cage, so that they're not going to be licking the walls and getting more cysts. We're going to be promptly

removing the feces in that new, clean environment, because even though we're treating them they still could be shedding cysts. If they step in it or contaminate their food, it is just going to make the process harder. They're going to be re-infecting themselves.

So, now we need to deal with our original cage, which has been contaminated by all these feces and the cysts. The first thing we're going to do is we're going to scrub. We're going to physically get in there, manually remove as many cysts as we can with just soap and hot water and get rid of what we can. We're going to remove our soap. We're going to rinse it out and let it dry. The reason why we're doing these first two steps – getting rid of all of the gunk and newspaper and whatever is left in the cage and drying it – is so that our disinfectant is more effective. The disinfectant of choice that we're using is a quaternary ammonia compound, or QUATS. There are some brands you might be familiar with. These have been proven to be quite effective at getting rid of the cysts, so the cysts that we haven't scrubbed out should be killed by the QUATS.

We want to make sure we have a good contact time. We want to make sure we leave that QUATS on there for at least ten minutes. Check the label [of] whatever product you're using, because we really want to make sure we're killing all those cysts that are residual, still in the cage.

We're going to wipe it clean and then finally, most importantly, we're going to dry it. Cysts, like I said, they live in the winter. They live in the wet. They live in the damp. We need to get it dry, so we can desiccate those cysts, make them so they're no longer infective. They can survive for weeks or months in a damp environment, so we really need to keep that in consideration when we're cleaning our cages. You can't just hose it down and shove new animals in.

This is a picture from a shelter in New Zealand, where I did a couple of rotations where they had chronic, chronic *Giardia* and other parasite problems. You can see where it says, "Animal housed." Is it indoor or outdoor?

*Audience:* Looks like outdoors.

*Dr. Hoshizaki:* Outdoor and I'll tell you, New Zealand has about as much rainfall as Seattle. It's always wet, so this dog is in a place that they're never going to be able to clean this kennel, right? It's going to be always contaminated with these cysts, no matter how hard they try, just because of the nature of wood and being outdoors.

So, now we've treated the individual animal. We need to think about everyone else who could be affected by the *Giardia*. What we need to do

is prevent the spread throughout the shelter to the other animals. We're going to place appropriate signage. We're going to put a big, old sign on the cage and say, "I have *Giardia*. Wear gloves. Wash your hands." Ideally, limit handling to those who know about *Giardia*, know the zoonotic potential and know how to handle it, so they're not spreading it throughout the shelter. Not every volunteer should be cuddling the *Giardia* puppies.

We need to have appropriate cleaning protocols and this applies, of course, across all the diseases we're dealing with. If we have good protocols we're going to be eliminating all the different diseases, not just *Giardia*. By picking up the feces and keeping it clean we're preventing re-infection of all the diseases, not just *Giardia*. We are going to allow the cages to dry before we add animals again.

We're going to keep the animals separate. I'm not saying you have to isolate them. This isn't like upper respiratory, where they need to go into a separate room necessarily, but we don't want to mix them. If the puppy with *Giardia* goes out into the play yard and then you have all your other dogs come out into the play yard, what's that going to do? That's not going to be helpful for your treatment regime, because they're going to be contaminating that environment. They're going to be contaminating the community cat room or the hallway where everybody walks. So, you need

to be conscious of where you're taking these animals and what other animals have access to that space. Of course, we don't want to be mixing animals, especially litters. You don't want to be putting sick animals in with the non-sick ones. It's common sense, right?

Because young animals are more easily, or at least more commonly, infected – we see them as clinical disease in the young animals – we want to keep them in easily cleaned cages. We don't want to put them into the nice, posh cat room with all the furniture. We want to keep them somewhere that we can clean in case they do get sick.

I already touched on this. What are you going to do when one of those cats starts having diarrhea, we SNAP test it and it comes back positive for *Giardia*? We're going to get rid of all the furniture that we can't clean and all [of] the carpeting. We're going to get rid of all [of] those toys and all [of] the blankets. It looks like in this picture that they have cardboard little hidey-holes. [That is] great, because we can throw those away– the cardboard hidey-holes and cardboard litterboxes. These are things we can get rid of. It's not a great cost.

We are going to be treating that one particular animal and we're probably going to be treating all the other animals in that environment, because

even though they don't have diarrhea, they have been exposed. Chances are they could be asymptomatic, but still infected.

Of course, we are going to be putting up signs on this door. This looks like probably an adoption area, so we want to make sure that everyone knows what's going on in this room and we're not just tracking *Giardia* in and out.

What about this? There are a few interesting things in this picture. There's a pool, a very nice swimming pool, for the dogs. There's a wooden pagoda, and there's gravel. Gravel is not as bad as dirt and grass, but I'm sure you can imagine if a dog with *Giardia* defecates in that yard that gravel is contaminated. How are we going to contain that? Same thing with the pool and with the wooden pagoda. How are we going to contain that? We might end up having to resurface our play yard. That is not something anyone wants to do.

*Audience:* Is there any type of treatment where you can treat the yard?

*Dr. Hoshizaki:* That's a very good question, and I'm hesitant to give a direct answer to that, because I guess it depends. If the animal goes to the bathroom right away, and we're able to pick it up immediately, is all the soil around it infected? Or has it been chronically infected with *Giardia* and all the dogs

have been kicking up the dirt and it's that we have layers and layers of cysts in the soil? I'm not aware of any recommended protocol really for that, unfortunately. In some situations you just can't get around it.

Resolution. So we come back two weeks later, after we've been treating our animal, and we're going to do a SNAP test again or look under the microscope again. If the animal is still sick, we're going to still treat. No brainer. But, we need to think why did our treatment fail? Why did the animal potentially re-infect itself? Did we not sufficiently clean it? Did we not keep their environment clean? Did we put them in an environment, which has cysts still in it? We need to keep these things in mind, because re-infection is more common than treatment failure. We may want to consider a different drug protocol if we think we didn't use the correct dosage or the right amount of time for the drug to take effect.

We also need to look for other causes of diarrhea. Like I said, *Giardia* might just be one part of the problem. The animal might have some other issue, or other parasite, which is causing the disease and we need to make sure we have ruled those out as well.

Now we have to think about adoption. If we have an animal [that] we have treated for *Giardia*, it is healthy, but it's still SNAP positive, what do we do? We need to weigh the pros and cons and how we're going to



tackle this adoption. Of course, always in the back of the mind we're thinking, "We are adopting out an animal that has a potentially zoonotic disease and what does this mean for our adopters?"

We need to remember that immunocompromised humans are at risk, so people with certain diseases and children. *Giardia* can be very life threatening for them, so we need to consider what kind of home we're placing this animal in. Many shelters have chosen to do a waiver. Of course, client communication and education is very important. We are going to have someone sit down with them, and explain to them that they are adopting an animal with *Giardia* and this is what it means. We can have them sign a waiver to help negate some liability on the shelter's behalf, but as you probably can figure out, there's no great way of completely reducing the risk.

As another side, if you're adopting out a cat with *Giardia* and you're adopting it out to the nice old lady who has six other cats, what does that mean to her whole household? Are there going to be repercussions down the road – that you're going to feel quite bad about if she comes up with a bunch of sick cats?

I asked the question, "What is *Giardia*?" Now, in your mind, I'm hoping a few more light bulbs are going off. It's not just diarrhea, right? It is a

common disease. Dogs, cats, humans and other animals, we need to be aware, have *Giardia*. It's a challenge to control depending on what kind of rooms your animals are housed in, what kind of cages and what kind of sanitation protocols you have. Control really depends on how you're taking care of your cleaning in that shelter.

Always remember, animals that are healthy could still have *Giardia*.

Animals that you treat could still have *Giardia*. We need to consider the risks, and decide what is best in our shelter situation of how we're going to deal with this problem.

If you would like some light reading, I can offer some excellent references. That's the end. I would like to thank Maddie's Fund<sup>®</sup>, the ASPCA and Cornell University for having this talk and for having me. I'd like to it open up to any questions you guys may have.

*[End of Audio]*