The First 60 Minutes: Animal Sheltering's Critical Hour
Webcast Transcript

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Laurie Peek: Now it's my honor to be introducing Dr. Brian DiGangi, clinical assistant professor of shelter medicine at the University of Florida's College of Veterinary Medicine. Dr. DiGangi is board-certified with the American Board of Veterinary Practitioners in canine and feline practice, completed a three-year residency in shelter medicine, was a co-founder of the University of Florida's Student Chapter of the Association of Shelter Veterinarians and serves as a member of the board of directors of the Association of Shelter Veterinarians.

During his student years he regularly volunteered at the county animal shelter, organized spay/neuter wet labs for students, participated in Operation Catnip for community cats and fostered animals for local rescue organizations. His research focuses include: cleaning and disinfection in animal shelters, high-quality, high-volume spay/neuter techniques and enhancing the welfare of shelter animals.

This webcast is part of a series marking the launch of Maddie's Institute, a program of Maddie's Fund, which is the nation's leading funder of shelter medicine education. Our commitment to supporting shelter medicine grew out of our belief that in order to reach our goal of saving all our nation's healthy and treatable shelter dogs and cats, we needed a strong group of veterinary professionals trained to keep shelter pets healthy and to rehabilitate those who are not.

Saving those dogs and cats is the fulfillment of a promise made by Maddie's Fund's founders, Dave and Cheryl Duffield, to honor the love brought into their lives by their miniature Schnauzer, Maddie. They chose to memorialize her by creating a charitable foundation that would make this country a safe and loving place for all her kind. I want to thank Dr. DiGangi and everyone here this evening for being part of fulfilling the promise the Duffields made to Maddie. Please use what you learned here tonight to make the dream she inspired a reality. Dr. DiGangi, welcome, and thank you so much for being with us tonight.

Brian DiGangi: Thank you, Dr. Peek, and thank you all for joining us tonight. We have quite a variety of audience members out there. I know that there are some pet owners, as well as veterinarians and, everybody with various levels of expertise in the animal field in between. And so, with that in mind, I'm going cover a variety of topics tonight related to intake of animals into the

shelter environment, and I've chosen a few select areas that I'm going to focus on a little bit more heavily.

I've chosen areas that tend to be areas of confusion or areas that people tend to have a lot of questions about. I've also selected quite a number of resources, and I'm going to point them out as we go through the presentation. I really strongly encourage you to look at those resources at some point as we go along or after the fact use a lot of Web links there that you can download documents from. That's really going to supplement some of the information that you'll hear tonight, so if there's something that you want a little bit more detail on, please go ahead and make use of those resources.

So, with that we'll go over a couple brief objectives for this presentation. Now, you had a more detailed list in your registration materials, and we will cover all the things that are mentioned in those materials, but really to sum it up, I hope that everybody will learn how to use the first 60 minutes of an animal's time in a shelter to really maximize their chances of a live release. We've called this presentation *The Critical Hour*, and it really is. There are things that you can do and things that, if you don't do when animals first come into the shelter will really impact their success while they're in your care and their ability to have a live release.

And I hope, as a second objective, that you'll be able to create a comprehensive intake protocol for your organization when you're done with this presentation or at least that it'll serve as a nice guideline for you going forward. If you already have a protocol that's written, I promise you can go back and fill in a couple of the gaps and add some details into that.

So, as a brief outline of the presentation, we'll talk about a variety of topics, which I've kind of lumped together under the heading of "Intake Planning." So a bunch of background information that you'll need to know if you're going to create a sound intake protocol for your shelter, and then we'll discuss some specific medical health concerns that you'll need to be aware of. We'll talk about behavioral health concerns and, finally, documentation and communication of all the things that you found throughout the intake process. And most of the time is going to be spent on intake planning and medical health sections. That's not to say that the others are any less important, but they're the ones that are going to require a little bit more explanation for us at this stage in the presentation. So, there is a more detailed outline in the resources as well, so feel free to follow along with that.

Laurie Peek: Okay, so it looks like we've got a poll question here. For those working or volunteering at a sheltering organization, does your organization currently have written intake protocols? Okay, it looks like 51 percent of you said,

"Yes"; 15 percent said, "No"; 14.5 said, "I don't know"; and 18.6 "Not applicable."

Brian DiGangi: Okay, well, that's great information. I'm glad to see that the majority of you do have written intake protocols. Perhaps a better question is: Do you know where they are, and do your staff members know where they are and what they say? So that's an important component as well but the first step is definitely there, and, as I said before, for those of you that do have protocols, hopefully that'll give you some ideas of where you might tweak them to make them a little bit better, and those of you that don't, hopefully this can serve as an outline for how you might go about creating a protocol.

So, we'll talk for a minute about why do we actually need to have written intake protocols? And the first of many reasons—I've just put a few up here on this slide. The first is for problem prevention. So, problems that I'm talking about could be operational problems, people not knowing what the next step is when an animal comes into the facility. We could be preventing medical problems that we're going to talk about: vaccination and de-worming and things like that later on. So we're going to prevent infectious diseases. We could be talking about problem prevention for behavioral problems, and we really focus on prevention because prevention is easier than troubleshooting problems or treating problems once they've already occurred. Not to mention, it's much kinder to your staff members and to your animals if you could prevent problems from happening.

The next reason is for consistency, so you want to be sure that you know what's happening to every animal when it comes into the facility and that the same thing is happening to animals as they go through. You want to have accountability, so we'll talk about which staff members are performing which duties as they relate to intake planning. So you want to know if something got missed, why did it get missed, and is there something that we need to do to retrain an individual or a group of individuals to make sure things are happening the way we intend them to. And then, of course, you want to minimize stress, and, again, this is both animal stress, as well as stress on the staff members that are performing all these procedures. If people have a plan and know what to do it's going to be a lot less stressful than if there's sort of chaos and no one knows what the next step is. And the bottom line is that having good, sound intake protocols really are going to ensure the health and welfare of both individual animals in the shelter and the entire population as a whole.

So, who is involved in carrying out intake protocols? Well, it's everybody. Everybody has an important role to play, so, we have a few key groups of the people that are frequently involved in intake of animals listed on this slide here, so you might have receptionists who are interacting with the public when an animal comes in through the front door. You have your

animal welfare officers, who are picking up animals in the field and interacting with people out in the field. You have the animal husbandry staff and the veterinary team. These are the people who most places typically think of as the ones actually performing intake treatments, but they don't necessarily have to be the only people that are doing those—and I'm going to talk about a variety of things—procedures that you want to do during intake. And, really, unless there are specific laws relating to who can and can't perform medical treatment of shelter animals in your area, almost none of the things that I'm going to talk about require any kind of advanced training to carry out.

Of course, they have to have some sort of training. Ideally you're going to create these protocols in consultation with your veterinarian and there'll be an ongoing assessment of people's ability to carry out these things the way that you want them to, but there's nothing here that anybody who is used to handling animals can't learn how to do.

So, to start out, I would like to introduce this topic knowing as "pathway planning," and this is something that actually starts at intake, and so it's going to set a little bit of a foundation for some of the things that we're going to talk about to follow. And what pathway planning is: it's a proactive approach to animal disposition. So, what that means is that when an animal comes into the shelter, in most cases you have a good idea what the animal's most likely outcome is going to be, and so we want to get them there as efficiently as possible. So, for example, if a cat comes into the shelter with collar and tags on, of course that's a really rare occurrence, so you should be celebrating that you know that that's a cat that you're going to want to try to get it returned to its owner right away, so you could take certain steps to be sure that it gets returned to its owner as quickly as possible.

Another example might be a purebred dog that comes into the shelter. You might have a particular breed rescue that you work with and you know really well, and if a breed comes in that fits in that group's work, then you want to give them a call and have that pathway defined ahead of time. And so these pathways are defined at intake, but they're reviewed daily and they can change periodically throughout an animals' stay.

And so most commonly the pathways that we're talking about are animals getting returned to owner, animals getting transferred to other rescue groups in the region, animals getting adopted directly from the facility and, in some cases, animals being euthanized for severe medical or behavioral illnesses. And so I put a couple ideas up on those slides of things you might want to think about in order to get animals to those particular pathways as efficiently as possible, and the only one that we're going to talk about in detail tonight is microchip scanning, but first I think we'll have another poll question.

Laurie Peek: For pet owners and community members, what form of identification do you provide for your pet or pets? 2 percent said, "Collar only"; 13 percent said, "Collar and tag"; 15.8 "Microchip only"; and 65 percent "Microchip, collar and tag"; 1.2 "Other form of identification"; and 2.4 said, "No identification."

Brian DiGangi: All right, well, that's great. I'm glad to see that so many people have both microchip and a collar and tag on their pet, so this audience is very savvy and really understands that you've got to have both permanent identification in the form of a microchip, as well as a collar and a tag, which can occasionally get lost on your pet, in order to increase your chances of getting them back. So, as I said, we are going to talk a little bit about microchips scanning, and I really want to get into the reasons behind why we make some of the recommendations we do regarding scanning of animals. So we'll look at a couple of research papers that were published in order to get this information.

So, the first one is a paper that was published by Dr. Lord in 2009. In this paper they looked at over 7,000 dogs and cats in 53 shelters all across the United States, and they really wanted to find out what the shelters' habits were in terms of scanning. How many times did they scan animals? What scanners did they use, and how successful were they at finding microchips when they were there? And so I have some of the information that we got from this paper in the little table at the bottom there, and you'll see that just under 22 percent of stray dogs that did not have microchips were returned to their owners. Compare that to the stray dogs that did have microchips. Over 50 percent of them made their way back to their owners.

And then we have a similar trend in cats, although a much greater value. So, less than 2 percent of stray cats that did not have microchips were returned to their owners, compared to almost 40 percent of stray cats that did have microchips made their way back to their owners. So this is important information for pet owners. This is good information for why you want to be sure that your pet has a microchip and that it's registered and the information is up to date with the microchip company, but it's also important for shelters, and this is the reason why you have to scan effectively, because look at the difference of the number of animals that will be in your shelter if you were scanning appropriately versus if you're not scanning appropriately and not picking up those microchips.

Some other findings that they had in this paper were that only about 21 percent of shelters scanned animals one time only. The problem with that is that over 900 microchips were found during the 2nd or 3rd scan, so it's really important that we scan animals multiple times and not just one time. That's almost 1,000 animals that wouldn't have been recognized as having a

microchip if those animals were only scanned once. And the other piece of information that I want to share with you from this paper was that about 52 percent of shelters only used one brand of scanner, and so we'll see why that's important as we look at another paper that Dr. Lord published in 2008.

And so in this paper they looked at six brands of microchips and four different scanners. They took 10 microchips from each brand and scanned them 72 times in each direction with each scanner, so the bottom line is that was a lot of different scans, and they scanned them by holding the scanner perpendicular to the microchip and they scanned them by holding the scanner parallel to the microchip, so over 1,400 scans for each combination of scanner and microchip, so a lot of tries. And what they found was no one single scanner caught every chip every time, and whether or not they found the chip actually depended on the orientation of the scanner and the microchip, so the direction that they held the scanner mattered. And the other thing that they found was that the ability to pick up a microchip was improved the more scans that they did for an individual chip.

So, that's all good information, but that wasn't in live animals, so those microchips were placed on a table and were scanned just over the table, so we want to see how they work actually in animals. So they did a third paper and published it in 2008. In this paper they looked at about 4,000 dogs and cats that were implanted with microchips. Each animal was scanned three or four times by a different person using a different scanner. And, again, what they found was that no single scanner caught every single chip every time, and another interesting finding was that as an animal's body weight increased, the odds of missing a microchip increased. So that suggests that maybe the scanning technique was incomplete for larger animals. People may have been using the same technique for a large animal as they were for a small animal and it was not picking up the chip.

So, we're going to look at a couple clips here of some microchip-scanning techniques, and I'll just let you look at them and think about how you might change the scan technique based on the information that we talked about.

[Video plays]

All right, so that first clip was very short. It was only about six seconds long, and that was kind of the point. So, that scan was way too fast. That was an animal that was being taken into a shelter that I visited, and that was its intake scan, so it was way too fast to pick up a microchip that may have been there. One thing that I forgot to mention was that in the studies that I talked about, they scanned those microchips at a very slow speed, so they went about half a foot, or six inches, per second when they were moving the microchip scanner across the animal's body, and they still missed some of the microchips. So we'll take a look at one more clip.

[Video plays]

Okay, so hopefully everybody has viewed that now and that scan was a little bit slower, but unfortunately it was incomplete, so you'll notice that they did not cover the entire animal, and we'll talk about how you actually want to do that in a minute. That was a small animal, so remember, the larger the animal gets, the more likely people are to miss the microchips. So if they didn't get it—a complete scan on a small animal like that cat certainly is not going to find one on an animal that's any larger than that. So that was not a good example of good scanning technique either.

So, what can we learn from all these studies? What's the practical take-home message? And one thing that I want you to understand is you definitely have to use more than one microchip scanner. Remember, of those studies - no single scanner picked up every chip every time, so you've got to use multiple scanners. And you've got to use a scanner that's able to detect all the different varieties of chips that are on the market, and so I've got those pictured here. There are four universal microchip scanners now. There's the Bayer iMAX Black-Label scanner, the AKC Companion Animal-Recovery Proscan 700, the Avid 1034 MiniTracker and the HomeAgain Universal Worldscan.

These are the only four scanners on the market that can detect all the different varieties of microchips that are available, so you want to be sure that at least one of these scanners, if not more than one, is somewhere in your scanning protocol, and you have to be careful that you're actually using the exact model that I have listed here. Some of these scanners, particularly the HomeAgain scanner, the AKC CAR Proscan and the Avid MiniTracker all look very similar to previous versions of these scanners, which are not universal scanners, so you want to make sure you have those exact model numbers.

So, what is the correct way of scanning an animal? So I came up with this acronym of SCAN, so you want to go very slowly when you're scanning an animal; remember, no more than half a foot per second. You want to hold the scanner very close to the animal, so think back to the study where they showed as an animal's body weight increased the sensitivity of the microchip scanner decreased, so you want to be sure that you're holding it really close to those microchips so you can get a good read on them.

You want to cover a whole lot of area, so look at the diagrams that you see to the right. You want to start up by the shoulder blades, where you would expect the microchip to be, but microchips can migrate, so you want to be sure that you cover the whole body of the animal. So, it's recommended to go down a snakelike pattern down the back of the animal. Turn the scanner

around and go down each side of the animal as well. And then it's real important to have some next steps laid out in your intake protocol. What is somebody supposed to do when they find a microchip? It does no good if they've found it and then they don't know what to do after that. So, if a chip is found, there should be a plan for contacting the microchip registry company and trying to track down that owner. If there is no chip scanned, for me the next plan is to scan them again, because maybe I missed it. So, now we'll take a look at a good microchip-scanning technique.

[Video plays]

All right, so hopefully everybody recognized the difference between that clip and the ones that I showed you previously, so it was a nice, slow, thorough scan of that dog.

So, we'll move on to the next topic in intake planning, which is animal identification, and here's a quote straight from the *Guidelines for Standards of Care in Animal Shelters*. Again, this is a resource that's listed at the bottom of your page there, so if you haven't heard of this or seen it, I encourage you to check it out. And it says in there directly: "A unique identifier must be established for each animal upon intake. Identification should be physically affixed to the animal, unless this poses a safety risk to animals and/or staff."

So I've given you a couple examples on this slide of how you might go about doing that, and there's a variety of different ways. So the Doberman on the top left has a disposable plastic collar, where you can write his name and information on it and slip that inside a piece of paper in the collar. The cat on the top right is wearing a collar and tag. The puppy on the bottom left is wearing a disposable paper collar, and then this picture on the right—I thought I would throw that in there too—it's a shelter that I visited in Israel that was actually making their own tags. They were able to inexpensively get a bunch of blank metal tags, and they just simply imprinted a number on each of those tags when an animal came in and then put the tag on the animal. So, there's lots of different ways of accomplishing animal identification.

And the second part, not only having an animal that has an ID that's fixed to the animal, is getting a good picture of the animal, too. So here are some photos that I took off the Internet. These are all, unfortunately, from a lost-and-found section of an animal shelter, and so you really have to pay attention to the quality of the photographs that you're taking and realize what they're going to be used for. These are posted on the Internet for people to look through and try to identify their lost pet. A lot of people are not going to come into the shelter, even though we all know that they should when they lose a pet. They're just going to want to look at the pictures

online, so I'm not sure that if any of these animals were mine I'd be able to recognize them based on the pictures that I'm seeing here. So, I'd hate for that to be a reason why an animal's not reunited with its owner.

On the top right you'll see an actual image of a cage card from a shelter that I visited, and there's no picture at all for that animal. It also doesn't have any sex listed or any age, so we know nothing about that animal that's in the cage behind that cage card.

So, here are some good pictures that you might consider setting up some of these examples. So, on the top right we have a shelter that's set up a little shower curtain in a little photo area to take some nicer pictures of their animals. On the left, a shelter painted a mural on their wall so that they could get a good background when they were taking pictures, and then just a couple of other photographs of some cats and a dog that really show off what these animals look like. It shows you a little about their size, a little about their personality, and that can go a long way in helping reunite these animals with their owners. And then once you have a good picture in the beginning it's a great photo to promote their adoption if they don't find their way back to their owners.

So you scanned your animal for a microchip. You've given it some identification. You've taken a nice picture and now we're going to talk about where are you going to put that animal. In some cases, the animal may already be in this intake housing area, which I'm referring to as a temporary housing area, not where it's going to stay while it's in the shelter. And housing site and style have been described in great detail in the guidelines that I referred to earlier, and, again, those are in your resource list, so I don't want to spend too much time on that, but you want to be sure that you have a designated area for animals when they come into the shelter. It should be an area that you can clean and disinfect well and be sure that you have an appropriate protocol for doing so, but the one thing that I do want to explain a little bit more is segregation.

So, we want to be sure that the intake-housing area is able to segregate animals, and what that means is separating them based on different characteristics. So, we know that one of the greatest ways that you can stress a cat is by putting it in a room with a strange dog, especially one that's barking, so you definitely want to be sure that you're separating species, so the picture on the right is obviously an example of what not to do. We have two puppies in a very small cage on the top and some cats on the bottom. You also want to separate animals by age when they come in, so different age groups of animals are going to have a different medical and behavioral need, so we need to be sure that we can accommodate those needs when they come in.

You want to separate them by sex, unless you're talking about littermates or housemates. We certainly don't want animals breeding while they're in the shelter. And then health status is one that you absolutely must separate them by. So, you don't want to have healthy animals next to sick animals, because then you're just going to spread disease around the shelter.

Some other things to consider: Some shelters like to separate animals by intake date. Necessarily all animals that came in together are kind of in a similar area, and as long as you're separating them by all the other things listed above, that might work for some people, and then if you have animals that are nursing or littermates, or housemates, you may want to house them in separate areas as well, not with each other but each three of those in separate areas. So, we'll take a look at a short clip of some intake housing.

[Video plays]

And, again, this video was an example of what not to do, so you use the first dog you saw was an older, small-breed dog, and then directly above that dog you had two young kittens, one who was obviously very stressed out and hiding in the back of the cage. And then you can pan over to the left and you saw the reason why the cat was stressed out was there was this cute little puppy, who was in the cage right next to him. And so each of those groups of animals, the older adult dog, the cute kittens and the young puppy have their own physical and behavioral needs that weren't being met in that environment.

So, the next thing that you have to think about is how are you going to move animals from one place to another, and that's what we call traffic flow. So, traffic flow or traffic flow patterns are the planned moving of people and animals throughout the facility to minimize disease transmission, and the key word there is "planned," so everybody should know what the appropriate route of walking through the shelter is, and sometimes that means putting up signs, locking doors, forcing people to go perhaps the long way around so that we don't endanger the health of the animals as we move through the facility. So, in general, you want to move from the most susceptible animals to the least susceptible animals, and so that usually means kittens and puppies before adults and healthy animals before sick animals. And we'll take a look at one more video clip of some traffic flow patterns in a shelter.

[Video plays]

So I just want to point out a couple things about that video. It starts off great, where the animal would come in if it was being brought in from the field, and it would come in through that gate that you saw in the beginning, and there was this great intake station set up right there, so as soon as the

animal came in it could get its intake evaluation and take treatments, which we'll talk about next. Then as you walk down the hall, as the animal would progress through to its holding area, you saw that we walked past all the trash and we also walked past a couple cages with some sick animals.

You'll notice that I zoomed in on a cat that was sneezing and had some respiratory disease, and that's where animals were waiting to be evaluated by the veterinarian, so every animal that walked into that shelter walked past all the garbage that was coming out of the shelter and past all the sick animals, so they were bringing in everything that all those other animals and garbage were carrying, they were being exposed to it and bringing it into the rest of the shelter. So, that was not a good traffic flow pattern to have. So, I encourage you to walk through your shelter the way an animal would walk through or take a video like that and go back and look at it and see what are the animals being exposed to as soon as you walk in the door that you might not be aware of.

Laurie Peek: We have another question. For shelter employees and volunteers, which traffic flow pattern is the most bio-secure: "Infirmary to adoption to stray holding," "Stray holding to nursery to adoption," "Adoption to stray holding to infirmary" and "Not applicable"? It looks like 6 percent said, "Infirmary to adoption to stray holding." 14 percent said, "Stray holding to nursery to adoption," and then 60 percent said, "Adoption to stray holding to infirmary," and then 19 said, "Not applicable."

Brian DiGangi: Okay, good, so most everybody got that right. The correct answer was the third choice, so moving from adoption to stray holding to infirmary. So, remember, you want to go from the healthiest animals to the sickest animals, and so adoption should be, in most cases, healthy animals ready to go out to the public. Stray holding should be healthy animals, but you don't know if they've been exposed to something, so they would be, come after, the adoptable animals, and then infirmary, obviously, is for those animals that you know are sick and are undergoing medical treatment.

All right, so we're ready to move on to the next section, which is medical health, and specifically we're going to talk about physical examination, some intake treatments that you'll want to do and a couple thoughts on diagnostic testing on intake. So, the first part of the physical examination is getting a medical history, so this can be either in written form or in verbal form. Verbal form is usually preferred. You never know when somebody can't read or can't write or is unable to fill out a form or simply unwilling to fill out a form, so we encourage you to have somebody actually interview the person using a standard set of questions so you can get the most accurate information possible. And then we'll go through each of these components of the physical examination independently. So description of the animal,

their age, their sex and neuter status, body weight and body condition score and then looking for any signs of infectious disease.

I'm sure many of you have seen the poster that I have on the right that I downloaded from the Internet of this cat that was found, and obviously that's not a cat, but it makes a good point about why we need to be accurate about describing the animals when they come into the shelter, so you want to be sure that you have a species recorded and that it's correct. You want to be sure that you have the right breed written down to the best of your ability and you want to have the appropriate color pattern recorded, and these are important for a variety of reasons—you want to have an accurate description should an owner come in looking for a lost pet. And even if the owner doesn't know the exact way of talking about an animal's color pattern or breed, those people at the shelter should know—should be using a consistent format that you all know what you're talking about with each other and you can help that owner find the animal that they're looking for.

This might be important in areas where there are breed bands, and you need to have an accurate idea of what the breed is so that you can record it in the records. Another time that this might be important is in the case of euthanasia. You want to be sure that you're checking the species breed and color pattern to be sure that you have the right animal before it's euthanized. So, there is—the other image on the screen is a cat identification chart. It goes through all the different color patterns of cats, and that's available, along with some other documents that you might find useful for the intake process. That's available online at UFShelterMedicine.com, so please go ahead and check that out. That's available for people to download and use in your shelter.

So the next component of the physical exam is determining the age—and this is important for a variety of reasons, especially when you're talking about vaccination, which we'll get to shortly. So there's a few ways of doing this. When you're talking about puppies and kittens you can look at some developmental milestones: So, at about two weeks of age their eyes will open. At about three weeks of age they'll start to get their baby teeth and they'll begin to walk and crawl around. At about four weeks they're really walking steadily and they may actually start playing and acting like puppies and kittens.

A couple other ways that you can guess age on dogs and cats: The first one is actually for cats only, so it's the pound-per-month rule, so this is the idea that a one-pound kitten is about one month of age, and you can use that rule up to about seven or eight months of age for cats. Another way of doing it is by looking at their permanent teeth. Cats and dogs get their permanent teeth at a very predictable rate, and there's different information out there about exactly when the teeth come in, but one that we tend to use here is that

the first set of incisors come in at 12 weeks. The second set of incisors come in at 14 weeks. The third set come in at 16 weeks and the adult canine teeth start to come in at about 20 weeks and they're fully erupted. You'll see the third bullet there; the permanent canines are erupted by about five and a half to six months of age. There is a nice step-by-step color chart of all this information that you can post in your intake are also on our Web site at UFShelterMedicine.com.

A couple other tips for aging animals that are a little bit older: If you're talking about intact male cats, they tend to have really large jowls, so that's the kind of big, fluffy cheeks that you see on the cat in the upper right, and that's only in intact male cats, and they're usually about one and a half to two years of age when you see that. You can take a look at the amount of dental tartar that's built up in dogs' and cats' mouths. Usually you won't see much dental tartar until they're about two or three years old, so you can use that as a way of guessing. And then another way is looking at their eyes and seeing if they have what's called nuclear sclerosis, and that's the sort of bluish tint to the lens of the eyes. In dogs and cats it's much more common in dogs than in cats, but usually you won't see that until they're about seven years old.

You want to be sure that you know the sex of the animal, and that's important for a variety of reasons. Like we mentioned before, you're going to segregate animals by sex for housing. If you're trying to return an animal to its owner, you're going to need to know the appropriate sex, because the owner sure is going to know. For adoption, people want to know if they're getting a boy or a girl, and then for spay/neuter planning. If you have to plan enough time to do surgery on a boy versus a girl, you'll need to know that. So, kittens are usually much harder than puppies and dogs to figure out the sex, so we'll go through that really quickly here.

There's two ways of figuring out the sex. In males, this first method of looking at is called the anogenital distance, so that's the length of the space between the anal and genital openings. In the male it's a lot longer than in the female. And another method is in a male you'll see two circular openings, rather than in a female you'll see a circular opening followed by a, more of a slit shape, and so it looks kind of like a colon and a semicolon to some people.

And then, of course, you want to check the neuter status so that you can determine do we really need to spay or neuter this animal and get it on the schedule. Some ways of doing that are looking at the body condition of the cats and dogs. They tend to be overweight when they're spayed and neutered, making sure that you're looking for—so that's the cat in the upper right, obviously. On the bottom right you'll see a little green mark—don't forget to look for tattoos. Animals that have been spayed or neutered

hopefully are getting a tattoo so we can tell that. The cat on the bottom center has a tipped ear; this is a cat in a managed feral cat colony. And then on the left, this one may take a little bit more skill to get used to doing, but you have male cats that have spines on their penis if they're not neutered, and the spines go away once they are neutered, so that's another way that you can tell.

Another thing that you want to do during your physical exam is check out their body condition score. If you can get a body weight, that's great, but a body condition score is a nice, easy way of assessing their condition also. It requires you to put your hands on the animal, so you may find some other problems when doing that. And it also can be a good indicator of their physical and emotional health if they stay in a shelter for a period of time. So, if you get a good baseline at intake you'll be able to track any changes that happen as they go throughout the shelter stay. And then, finally, you're going to look for infectious diseases. On the left we have the cat that's being screened for ringworm. In the center we have a cat and dog with a nasal discharge, and I'm not sure if you can tell, but on the right we have a cat on the top cage that is having some diarrhea that's leaking down to the bottom cage. So, these are obviously things that we want to know ahead of time so that we can protect the animals in the population, separate these sick ones from the healthy ones.

And then, of course, don't forget about non-infectious diseases as well. On that top left this one is one that will take a little bit more skill to figure out, and you may need to consult with your veterinarian, but this dog has kind of a potbellied appearance. He was actually in heart failure from heartworm, so he's got a lot of fluid built up in his belly. We have a dog on the top right that was starving, so obviously it's going to need some special nutritional considerations. The puppy on the bottom with demodex, mites and then a dog on the left with some severely overgrown claws. So we frequently confiscate pets for signs of neglect in our animal shelters, so we better be sure that we're identifying those conditions if they're in our shelters and treating them if they need our care.

All right, so then we'll move on to vaccination, which is another very important step in the intake treatments. We'll answer the questions that you see there. We'll go through these one by one. So the first question: Is it necessary to vaccinate animals? So there are still a number of shelters that are not sure and so I pulled out a couple news articles—it's not too hard to find these—to really answer that question.

So, here's one that shows—it's called "Distemper outbreak hits shelter dogs again." I'll just read it to you briefly. It says that, "The county's animal shelter has suspended dog adoptions for at least two weeks after the discovery of canine distemper in two adopted dogs. The pets' veterinarians

informed the shelter of the problem and had to euthanize the dogs. This is not the first time distemper caused the shelter to suspend dog adoptions. An outbreak earlier this year led to suspension of dog adoptions and the shelter killed 17 dogs with distemper. 'From the first outbreak, what we've done differently is we vaccinate some of the dogs now,' he said. 'We vaccinate the ones we think can be adoptable.'"

And so what I learned from that is that they actually were not vaccinating dogs before this happened, and they're still not really vaccinating the dogs now. They're vaccinating some of them, so I'm not surprised that they had an outbreak.

And a similar story: here's "Cats euthanized after the virus spreads through an animal shelter." As we cut down to the bottom paragraph, you'll see that there is a vaccine that guards against the disease. The shelter will investigate on Tuesday to make sure it has the right drug combination moving forward. So, again, here's a shelter that was not vaccinating, and sounds like they're still not, so hopefully that answers the question of whether or not it's necessary, but in case you wanted some more scientific information, we have that for you.

So, I just want to show you some research data that we've collected at UF. This relates to the presence of protective antibody titers, which, if you listened to Dr. Schultz last month you know all about those. On the left you see the percent of dogs that had protective antibody titers, and that's shown by the gray bar, and the percentage of dogs that did not have protective antibody titers is shown by the red bar, so on the left we have canine distemper. On the right we have canine parvovirus, and in this study they looked at over 400 dogs and took a blood sample when they came into the shelter to see if they were protected or not. And, as you can see, most of them were not protected against canine distemper and about a third of them were not protected against canine parvovirus.

And so they wanted to see, well, could we tell who is protected and who is not protected by looking at some other characteristics, such as where they came from. So the source didn't matter. It didn't matter if they were relinquished by an owner or picked up as a stray, and it didn't matter if they were healthy or not when they came in. They couldn't distinguish based on those characteristics which dogs would be protected and which would not.

Last summer I did a similar study in cats to figure out what percentage of cats coming into the shelter were protected against these diseases: feline panleukopenia, feline herpes virus and feline calicivirus. I really wanted focus on the panleukopenia virus, since that's the one that can kill cats in shelters and it's also the one that we have a vaccine that can prevent them from getting sick. So just focus on that for a minute and you'll see that over

50 percent of the cats that came in were not protected against panleukopenia. And we also look to see if there are any other characteristics that might allow us to predict which cats were protected and which weren't, and we found that whether or not they were healthy at intake didn't matter. We couldn't tell based on that whether or not they were protected.

Here are some other findings that we got from that study. Cats that were neutered were more likely to be protected against panleukopenia and herpes virus than cats that were not neutered. As the cats got older, they're more likely to be protected against herpes and calicivirus, and then cats that were relinquished by owners versus stray cats were more likely to be protected against calicivirus.

All right, so hopefully that's enough to convince you that animals are not protected when they come into a shelter and there's no way to distinguish which ones are protected from which ones are not so that we actually do need to vaccinate everybody when they come in. And then the question is: Does it matter when vaccination occurs? Do we really have to do it as soon as they come into the shelter, which is commonly recommended?

To answer that, we need to know how long it takes an adult to respond to a vaccine, and this is a graph of an animal's antibody concentration, which, again, antibodies are the things that are going to protect an animal from developing disease if he gets exposed to a disease, so an animal that's never been vaccinated before, he gets his vaccination on Day 0 when he comes in, and it's going to take him between 5 and 7 days, in most cases, to develop a response. That's going to be enough to protect them against infection, so that's why you always hear the recommendation before you're going to a boarding kennel or for a spay/neuter appointment that you want to vaccinate your animal a week before.

But, the good news is that most animals have seen a vaccine at some point in their life before that, so in these animals that have been vaccinated once before, the black line is what happens to their antibodies, it only takes them between one and three days to develop a response. The problem comes that we can't tell which animals those are. We can't distinguish the animals that have been vaccinated before versus the ones that haven't, and that's the data that I've showed you from the studies just a few slides ago.

That's all related to adults, but the case is a little bit different when you're talking about puppies and kittens. Puppies and kittens, when they're born they nurse off of their mother and they receive antibodies from their mother, and these are good things. These antibodies protect them against disease, but the problem with these antibodies is they prevent vaccines from working. And we don't really know how long they last in individual animals, so we have this bluish-gray line going right down the middle

representing most animals, most puppies and kittens. That's how long the antibodies will last, so around up to 15 weeks of age or so, but we don't know, so we have dotted lines on either side. They might disappear by 10 weeks of age. They might disappear by 18 weeks of age, so somewhere in that window those antibodies are going to be gone.

Those animals are going to be at risk for developing disease, but if we vaccinate them when they have those antibodies, that vaccine won't work, and so the problem, again, is we don't know when that's going to happen. If we vaccinate these guys before those antibodies have disappeared, the vaccine is not going to work, so that's the—to the left of that blue line, where you see the unhappy face. If we vaccinate them after these antibodies have disappeared, the vaccine's going to work and we're going to be all set. So, again, we don't know when these antibodies are going to go away in individual animals, so to get around that we have to vaccinate animals every two weeks when they're puppies and kittens until 16 weeks of age to be sure that they are protected, because most puppies and kittens, these antibodies will be gone by 16 weeks of age.

All right, so just a couple references for people that might be interested in this sort of things. Here are a couple studies that I found that told you exactly how long it took for animals to be protected against the diseases you see on this chart here, and so the point is that all these animals had not previously been exposed or vaccinated before, so this is the first time they saw a vaccine, and though some of them responded in a few hours, some responded in a few days, so it does actually matter when we vaccinate them. If you give it to them as soon as they come in, you can actually make a difference in animals' ability to fight off disease that they're exposed to in the shelter.

And then one more question about vaccination is: Does the type of vaccine matter? There are two basic types of vaccines: modified live-virus products and inactivated or killed products. And just like everything, there are pros and cons and risks and benefits to both. We just got finished discussing how the most important thing in the shelter is to be sure that they get protected as soon as possible, and in our case, for most shelters and the rescue groups, that rapid response is the most important thing to us, so the benefits of using a modified live-virus vaccine outweigh all the cons, and so we really encourage people to use modified live products in their shelters.

One other question about vaccines that often comes up is: What about intranasal vaccines for respiratory diseases, bordetella and feline herpes and calicivirus vaccines? And these are great. They stimulate immunity at the site where infection occurs. They don't interfere with maternal antibodies. You don't have to worry about the problem that we talked about earlier, and there's evidence that they may provide stronger, faster protection against

respiratory diseases, which is all good, but there's one very important exception, which is that intranasal vaccines for cats for feline panleukopenia do not provide a strong enough immune response quick enough to be effective in a shelter environment. So if you're going to use these intranasal vaccines for your cats, that's great, but you still need to use an injectable vaccine for them as well, to be sure that they're protected against panleukopenia.

We have vaccination schedules here for shelter animals. Dr. Schultz talked about this last month, so I'm not going to spend much time on it. These are here and have been agreed upon by the American Animal Hospital Association, it's written about in shelter medicine textbooks, and you have those resources in your list if you want to look up more information on that, but those are the basic protocols for dogs, and then we have the basic protocols for cats. Again, they're written specifically for shelter animals by the American Association for Feline Practitioners and, again, in shelter medicine textbooks.

Some key points on vaccination: You want to be sure that you vaccinate every animal, regardless of its health status, regardless of its source, every one, because you don't know who's protected and who's not, and if an animal is not healthy enough. If you're so afraid of its health status you think giving it a vaccine is going to cause a problem, that's probably not an animal that needs to be in your shelter and needs to be evaluated by a veterinarian in an emergency hospital if you don't have a veterinarian around nearby. It's not one that should sit around and wait for something else to happen.

You also want to vaccinate animals before, if at all possible. If you can schedule intakes, get those animals vaccinated before they ever come into the shelter, if not, as soon after they come in as possible, so we're talking about between minutes and hours after they come in, not a few days. And you want to be sure that you use modified live vaccine products as well.

All right, briefly on parasite control: You don't want to forget about parasite control in the shelter. The Companion Animal Parasite Council has guidelines that are good guidelines to follow for de-worming animals in a shelter environment, and it's important to pay attention to both internal and external parasites, because both of these can cause clinical disease in animals. They make animals sick. They can also transmit disease to people, and they can really impact the shelter's image. So, think about what the public is going to think when they come in and they see a lot of worms, a lot of diarrhea, or they see fleas and ticks on the animals. They're not going to want to come back to your facility.

All right, so we will go into a couple issues regarding diagnostic screening tests. For dogs, some of the most common diagnostic screening tests at intake are for canine heartworm disease. The American Heartworm Society does recommend testing of all dogs that are greater than six months of age, and the reason for that is because dogs that are infected have more specific needs that we need to address. So, we can't just not worry about it because they have certain medical needs that we need to take care of, so they should be strictly cage-rested. They should be on certain antibiotics, and the other reason is that if you have infected dogs in your facility, they can actually serve to help spread the infection to other dogs. If a mosquito comes in, bites that infected dog, it can go and then infect other dogs in the shelter.

We realize that not every shelter can do that, so there are a couple of alternatives that a lot of shelters will do. One alternative is to test dogs that have been selected for adoption, and the other alternative is what I call the screen-and-test protocol. That's the idea that you screen all dogs that are over six months of age for microfilaria. So these are the—you can think of them like the baby heartworms. If a dog has baby heartworms it obviously has adult heartworms as well. If a dog tests negative for the microfilaria, then go ahead and perform the adult, which is antigen testing on them. That'll save you a little bit of money on those animals. I put a little chart up there about the different testing methods and how much it costs and the blood sample size that we would need, as well as how accurate the different types of testing are for anybody who's interested in that information.

And, similarly, we want to talk about testing for retroviruses in cats. So, the American Association of Feline Practitioners has put together a really nice document and there's a format of it that has one page specifically dedicated to shelters. I encourage you to take a look at that. They recommend testing of all cats for feline leukemia and feline immunodeficiency virus, but whether or not you test them at admission can depend on how you're going to house them. It's optional if you're going to house cats by themselves, because they're going to be less likely to transmit it to each other, but if you're going to house cats in groups, you definitely need to test them, and you do want to test cats individually.

The reason that that's important is you can't just test one cat in a litter and assume that all the others and the mother is going to have the same results, because one littermate may be positive; one may be negative. The same can go for the mother as well, so she may be positive but the kittens may be negative, so you can't just test one and assume the results will work for all of them. Some people will try to get around that by combining blood samples from littermates or from moms and littermates together, and that doesn't work either, because what happens when you—this is called pooling of samples—and you mix them all together, it actually reduces test sensitivity, and that means you're going to get more false negative results,

and that means that you're going to miss identifying infected cats. So, you might adopt them out to the public and not know that, and you might keep them in your shelter in a group housing situation. They might continue to spread the disease around. If you think of the test kind of like this fishbowl on the left and the virus is like the little beta fish, in a normal situation you're asking that test to find the beta fish, real easy. It's a one-gallon little fish tank, but when you combine all those samples together, it's like asking that test to find the beta fish in that giant, million gallon aquarium on the right.

At what age can you test kittens for feline leukemia and feline immunodeficiency virus? When you're talking about feline leukemia, that tests for the virus itself—so you can test kittens at any age. If you're talking about FIV, it's looking for antibodies, so indications of exposure to disease, and so you don't want to test kittens less than six months of age, because you might get false positive results.

All right, so that concludes the medical section, and we're getting close on time here, so I'm trying to hurry up a little bit, but I do want to show you this clip as we move into the behavioral health section. And just take a look at this dog and think about what you think his behavioral health is.

[Video plays]

All right, so I'll tell you that that dog was doing that behavior for hours and hours. There was nothing happening in the kennel next to him. He would just jump up and down and run in that repetitive circle over and over and over all day long, so hopefully that you'll recognize that that's not a behaviorally healthy animal, and he may have perfect blood-work. He may have perfect physical examination, but something is out of balance. Even if all his medical health parameters are perfect, that's not a healthy animal, because we've not met his behavioral health needs.

And I like this quote here by Melissa Kaplan, I'll just read that to you. It says, "Knowing how to care for an animal in captivity is more than just knowing about the basics, such as temperature requirements, the right substrate to use, what type of food they eat and how to offer water. To really care for any animal in captivity, we need to know about how that species lives in the wild, how they make use of their environment and the signs that indicate when we are doing it wrong."

So I point that out because frequently those signs that indicate we're doing it wrong come in the form of behavioral problems. We have to approach behavioral health the same way we approach medical health, and that starts at intake. So, just like we do a physical examination, we'll have to do a behavioral examination. Just like we do intake treatments to prevent

problems, we have to do stress reduction and environmental enrichment to prevent problems down the road. And then, just like we do diagnostic testing for specific diseases, we have to do behavioral evaluation and modification to prevent specific problems. And not that we're going to do all those things at intake, but intake is the first step in identifying those problems and creating the plan for the next steps.

So, again, just as with medical health care, behavioral care starts with obtaining a history, because how can we meet the needs of an individual animal if we don't know what they are? And again, ideally, you're going to try to collect that information verbally but written works as well, too. There are some really nice sample behavioral information collection forms that we've put in the reference section for you to take a look at, but you want to find out what's the lifestyle of this animal. Are they used to living indoors? Are they used to living outdoors? Are they used to being around adults or children? What are they going to do when you scratch their ears or touch their feet? Are there any specific behavior problems that we need to know about if we're going to take care of this animal in a shelter? And then it's always good to ask about any tricks and talents that they might have, because that can go a long way to helping them get adopted and really promoting them while they're in the facility.

We'll talk just for a minute about stress reduction, and many of the behavior concerns we see in shelters arise out of stress, so that's why I want to touch on this, and when I say "stress" I'm talking about the abnormal or bad kind of stress. I'm using the definition that you see here, which is "An abnormal or extreme adjustment in physiology or behavior in response to an aversive stimuli." And you'll notice that the word "physiology" was in there. There are actual physical changes that happen in animals when they're stressed. It's not just, "Oh, well. He feels bad."—there's actual physical changes happening. So, when you're talking about short-term stress, that causes the body to release epinephrine or what's called adrenalin, and that can result in increased heart rate, increased respiratory rate, sweating—all the things that you see listed on the left there.

Really, particularly important for us in the shelter is the suppressed immune systems. We talked earlier about how important it was to have a strong immune system to fight off the diseases that animal might be exposed to in a shelter, and that should be of huge concern to us if we're going to depress their immune system just because of stress. And similar things happen because of long-term stress. So, with long-term stress you get cortisol released and various other physical changes happen, so an animal becomes dehydrated. Again, we have a depressed immune system. They might shed viral diseases. They might develop ulcers. They might develop insulin resistance. If we're trying to ensure good health and welfare in the shelter, we must include some provisions for identifying and responding to stress.

Again, this starts at intake with the way that we handle animals, the variety of stressors that we choose to expose them to during the intake process.

What is stressful to any individual animal is a combination of things, so it's a combination of genetics and what they're born with and a combination of their experiences and the environment that they've been exposed to. It's the same nature-versus-nurture argument that we hear about all the time, and we know that the shelter environment is inherently stressful, so we must take every precaution we can to not make it any worse. And so you'll see in the boxes in the center a couple things that make stress better or worse. The severity of certain stimulus can dictate how stressful it is, whether it's something brand new to the animal or something they've seen before. Whether it's predictable stress. Do they know what's going to happen next? And the duration, how long is that stressor going to last, can really make a difference as well.

Environmental enrichment is actually the tool that we can use in the shelter to help reduce stress, and here's another quote from the guidelines: "Enrichment should be given the same significance as other components of animal care and should not be considered optional." And we have some examples of ways you might enrich the environment of animals in your shelter care in the pictures here. There are also a couple handouts on the UF Web site about simple shelter enrichment ideas that you can use. So, again, you're going to identify animals' needs when they come in at intake. You can identify those stressed animals and you'll be able to set them up for success by enriching their environments in particular ways that are good for them.

So, the last thing regarding behavioral health care that I want to touch on is behavioral evaluation and modification. In my opinion, intake is not the appropriate time for a formal behavior evaluation or what people refer to as a "temperament test." I like to think of a behavioral evaluation as a combination of many things that happen throughout an animal's stay. I've listed a few of those things here, but you'll notice right at the top of the list observations at intake are a key component of this, and they really help you identify the needs an animal will have during its shelter stay, and so you can use that in combination with all the other things you see here to really get a good behavioral evaluation, a really comprehensive idea of what's going on with that animal and what its needs are.

And, for more information on that there's a bunch of resources listed here for you that have really good information. The *Animal Sheltering* magazine has really nice articles about behavioral health care in the shelter. If you're not a subscriber to that, I encourage you to take a look at it. You can view old issues online for free. The Center for Shelter Dogs has a great Web site with lots of good in-shelter training techniques and extensive information

about performing a formal behavior evaluation or temperament test. Open Paw and the Training to Adopt Web sites both have lots of really good practical in-shelter techniques and tricks that you can use to help enrich an animal's environment and train them using positive methods. Of course there's the *Guidelines for Standards of Care* and then I mentioned some of the resources on our Web site at UF.

We're on the last section here, which is documentation and communication. So you've collected all this physical and behavioral information about the animal during this first hour, and now you can use that to categorize animals, and so one way that is commonly used to categorize animals is using these Asilomar definitions, and I'm sure many of you are familiar with this, being this is a Maddie's Fund Webcast. And so what Asilomar is, in case you haven't heard of it, is a way of categorizing animals in the shelter and determining whether they're unhealthy not treatable, they're treatable or they are healthy.

And I just want to point out a couple of areas that tend to be confusing about using the Asilomar accord. The first one is demonstrated by this slide here. You'll notice that I've got the arrow from all the different categories going out to a successful adoption. The status that's given to an animal, the Asilomar status, doesn't necessarily define its outcome; it's just a way of categorizing it so you can track the information. In some cases even unhealthy, untreatable animals may be able to get adopted.

So the next thing is who does the Asilomar definitions refer to? And I've got some quotes directly from the document there, so it's community-based. It's based on what reasonable and caring owners and guardians in the community would do for their pets and how they would categorize their pets. So a lot of shelters might categorize animals based on what they can do for them in the shelter. That's not actually the way that these guidelines are meant to be used. There's lots of information on Maddie's Fund's Web site about how to actually go about figuring out what your community thinks should be in each category.

The second thing is that the Asilomar definitions talk about both physical and behavioral diseases, so you don't want to forget either side of that scale or member with one without the other leads to an unbalanced situation and an unhealthy animal, so we're talking about both physical and behavioral health. And then the last thing is when you're actually reporting these categories, these guidelines are a little bit vague but they generally ask for you to report the Asilomar status under euthanasia statistics, and I would really encourage you to count these descriptions both at outcome, as well as at the time of intake, which is why I'm talking about it now during this discussion of intake. Think about how useful it would be to know if an animal came into your shelter healthy but left sick. You'd want to know

that information so you'd want to figure out why did that happen and how could we make it better. At the same time, wouldn't it be great to know if an animal came into your shelter sick but left feeling much better? That would be a great thing to report to your funders and donors.

So, with that, we'll see what you guys are doing.

Laurie Peek: For shelter administrators and managers, at what point during an animal's time in the shelter do you record his or her Asilomar designation? It looks like 3.6 percent of people said, "At intake only"; 4 percent said, "At disposition only"; 15.9 said, "At intake and disposition"; and 18.6 said, "We don't use Asilomar definitions," and 57.7 said, "Not applicable."

Brian DiGangi: All right, so hopefully I've given those who are only categorizing at intake or only at disposition a couple ideas, and maybe you'll consider categorizing them at both time points just to kind of give yourselves a check and see how you're doing. Asilomar is one way of communicating externally with the public and with funders, but you can't forget about communicating internally with the shelter as well if you've collected all this great information during your intake exams, and you've got to be sure that you communicate that to your staff. So you're going to have daily observations on every animal, and usually that's performed by the animal-care staff every day. Are they eating? Are they drinking? Are they doing okay?

You're going to have what's called daily rounds, which is performed by a daily rounds team, and the point of this is to identify the physical and behavioral needs of the animals, each animal each day, and actually create a plan to respond to those needs. And then, finally, for animals that are identified as needing veterinary care, the veterinary staff is going to have treatment records that they're using to check on animals that are under veterinary care, and get them talking about this now, because all these things are going to have to be identified at intake and the animals are going to have to be set up to have these—to be on these—various lists of rounds at the time of intake so that they're not forgotten.

Sorry that we're running over time. I hope people have stuck with us here. I really think even though this took over an hour to explain to everybody it really doesn't take all that long to actually carry out once you're trained and you have a plan in place and you know what you're going to do. If you can create and actually utilize really sound intake protocols, you'll be able to protect the physical health of your animals, minimize stress and meet their emotional needs and maximize their chances of a live release and really set yourselves and your animals up for success.

And just a final thought: I like to think of animal intake as an opportunity to protect the health and welfare of the animals in our care, so, like I

mentioned earlier, we confiscate animals from bad situations and open our doors to unwanted pets, so it really is our responsibility to take advantage of the opportunity to give them the best care that we can. And with that I'll turn it back over to Dr. Peek.

Laurie Peek: Thank you, Dr. DiGangi. Thanks, everyone, for joining us tonight.

[End of Audio]