



Maddie's Institute

A program of Maddie's Fund®

How Stress is Sabotaging Your Dog Adoption Efforts

Webcast Transcript

January 2016

Are dogs in shelters developing health and behavior problems because of stress? And does that make adoption more difficult and less likely for those pets?

Certified veterinary behavior specialist Dr. Sheila D'Arpino has worked with shelter dogs since the 1990s, and seen the harmful effects of stress on sheltered dogs. Through her work at UC Davis, the Center for Shelter Dogs/Animal Rescue League of Boston, Maddie's Fund® and others, she's developed strategies to recognize those effects both in individual dogs and in the whole shelter population – yes, it happens!

Learning Objectives:

- The difference between adaptive and maladaptive stress
- To differentiate acute, episodic and chronic stress
- The definition and meaning of stress
- How a pet's personality influences intensity of reaction to stressors, recovery from stress, and behavioral response to stress
- Factors that cause stress in a shelter
- The role of stress and welfare on health, disease and well-being in shelter and rescue dogs
- How to clearly identify and characterize stress and poor welfare in dogs
- The impact of stress on a dog's likelihood of adoption.

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[Beginning of Audio]

Lynne Fridley:

Good evening everyone. Thank you for being here tonight to learn about how stress is sabotaging your dog adoption efforts. I'm Lynne Fridley, program manager for Maddie's Institute. Our speaker tonight is Dr. Sheila D'Arpino, director of research for Maddie's Fund, where her aim is to develop and support research that increases pet adoptions and improves pet well-being.

After graduating, Dr. D'Arpino worked as a general practice, emergency vet, shelter veterinarian at various hospitals and agencies. Then, in 2005, she graduated from Maddie's Shelter Medicine Program at UC Davis, becoming the first in the nation to complete a 3-year post-graduate behavior specialty training program with an emphasis on shelter animals and shelter behavior programs.

Before we start, let's talk about a few housekeeping items. Please take a look at the left side of your screen where you'll see a Q and A window. That's where you'll ask questions during the presentation. We urge you to get those questions in early because Dr. D'Arpino will address them periodically throughout the presentation.

If you need help with your connection during the presentation, you can click the Help widget at the bottom of your screen. The green file widget contains the presentation handout and a printable certificate of attendance for people attending this live event. So, be sure to download, save, and print. Dr. D'Arpino, thanks for being here with us tonight.

Dr. Sheila D'Arpino: Thank you so much, Lynne. Thanks for having me. I want to welcome everyone here. It's nice to see so many familiar names in our list of attendees and such a great registration for this topic. I'm really excited to be talking about stress and dogs. This is one of the first topics I ever spoke at conferences and I haven't had the opportunity to talk about it in quite a while. A huge thanks to Maddie's for allowing me to talk about stress.

There's going to be three sections to this webcast with a short break in between each section. And that short break is going to be for you to ask questions. So, if there aren't any questions, we'll move on to the next section. But if there are, we'll take a short break for that. So, please be sending in your questions.

The other thing I wanted to talk about before I start talking about stress is taking Pulse. Periodically throughout this webcast, I'm going to take your Pulse, which means there's going to be something that pops up on your screen.

If you're watching an on-demand version of this webcast, you're not going to see that pop up. But if you're watching it live here, you're going to see that pop up with a green thumbs up or a red thumbs down. That's checking in with you seeing how things are going and tell me whether you give a thumbs up or a thumbs down.

So, our agenda for today, we're going to talk about stress. I think we all know what that is and I'm going to take our Pulse for the first time. Don't

answer yet, but the question I want to ask you all, are you currently experiencing personal stress at a level that you feel affects your well-being?

So, go ahead and green check if you think you're under some stress that's affecting your well-being and a red thumbs down if you're not.

All right, and we've got the answers coming in here. So, right now, we have about 68 percent of people who've answered and it's closer to 50/50 in terms of who is feeling stress, who's not. But it looks like more of us are feeling stressed than people who are not feeling stressed, which is not surprising. Thanks so much for chiming in on that.

The stress is pretty ubiquitous. We don't always think about the role it plays, though, in the behavior and the likelihood of adoption of our shelter pets. And that's why we're all here today. In our first section, we're going to be talking about stress and what it is.

In our second section, we're going to be talking about stress again and how shelters and individual pet personalities affect their stress levels. And then in the third section, we're going to be talking about stress and welfare. The first section is just our introduction about what stress is and we're going to be talking about physiology and things like that.

But I'm going to start with a little story. You can see the cute puppy up on the screen who looks a bit stressed about being in that *[audio]*. That's not who I'm going to be talking about. I'm going to be talking about a dog like Virgil, and I know that all of us have stories about dogs and stress. Virgil, at the time I met him, was a friendly, well-adjusted dog with no problems. He was a great, great dog. But he was black, which some people are less likely to be interested in black dogs. Other people love them.

And he was also a Pitbull type dog in Boston. And in Boston, it's challenging for us to find homes for Pitbull type dogs, just like it is for many, many shelters across the country. Virgil, despite being a friendly, well-adjusted dog without any problems – and he was about seven years old – didn't get adopted.

We waited, and we tried to find him a home, and we tried to find him a home, and we waited, but no adopters came through the door. And Virgil began to deteriorate despite walks three times a day, play groups, and extra attention – because he was a staff favorite.

And Virgil ran out of options over time. He was with the shelter for several months, but his quality of life and his behavior – some behavior

problems appeared – deteriorated to the point that the shelter was unable to find Virgil a home.

And it was a very sad and life changing experience for a lot of the people who loved Virgil, but it really brings home the idea – and I know we all have our Virgil stories and that’s why we’re all here today – but that stress impacts our adoptions.

Virgil came in as a healthy, wonderful dog and he did not leave that way. It causes the deterioration of wonderful dogs like him who we might be able to save if we are able to recognize and develop preventative strategies early on. The story is sad, but it’s an important point.

And by learning about stress, we can prevent other dogs like Virgil in the future. You see this picture here and of a Vizsla and a Spaniel. And in looking at this picture, which of these dogs is stressed? Is it the Vizsla? Is it the Spaniel? I think most of us would agree that Spaniel is pretty stressed by that mouth coming at him.

I would argue that both of these dogs are stressed. There’s something stressing out the Vizsla to make him behave aggressively. I would argue that both of these dogs are stressed and they’re both experiencing it. But what really is stress? It’s our physical and physiological – which includes emotional – response to a threat. These two dogs are certainly experiencing it.

It is what mobilizes our body’s resources to keep us alive when we’re exposed to a significant stressor. And when I say stressor, I’m talking about something that causes stress. Could be another dog like in this picture for the Spaniel.

In this picture, that stress and the Spaniel’s response to that stress might be saving that Spaniel from harm by enabling him to move away from that threat. However, if the harm is a fight over a valued resource like food, it might also be what enables that Spaniel to fight back and secure a resource that is necessary for him to live. Especially if resources were very scarce.

Stress is our fight or flight response. It’s what protects us from really bad and scary situations. So, there’s a very valuable purpose for stress and our stress response, but it can also cause some challenges when things don’t work exactly as we would want them to.

Physical signs of stress. So, you can see a word cloud here. And there are many physical signs of stress, some of which you can see on this slide. You can see decreased appetite, that’s a pretty common one. When we

think of our own bodies, many of us eat more when we are stressed. That can be true with pets, but decreased appetite is a lot more common.

All the items that you see up on the screen there are more common signs of acute onset stress. And they're the classic signs. Things like tense muscles and dilated pupils that we think about related to stress, but it's really important to remember and we're going to be talking about frequently in this webcast. That stress can manifest as almost anything.

And that's a challenge, right? Because if it can manifest as almost anything, how do we know if a dog is stressed? How do we know if it's the stress that's leading to the behavior change versus some other thing that is causing that behavioral issue?

We'll be talking about all this today. We're going to be watching two videos, next, taken at a shelter. I'm going to have you all watch and then answer a question about whether you feel the dog is stressed and if so, how stressed is the dog? Here we go.

[Video plays from 10:30 to 11:35]

All right. So, that is our first Pitbull type dog that we are going to evaluate and comment and give our opinion about his stress level. We're going to go ahead and launch our first poll.

Lynne Fridley:

The first poll is "How stressed is that dog that we just saw? Not stressed at all, slightly stressed, moderately stressed, highly stressed, or you're not sure." Please answer on your screen, not in the Q and A box.

And while you're answering on your screen, I'm going to ask you to submit your questions to Dr. D'Arpino. We'll be taking a break in a little while and she'll be able to answer some of them then. So, answer on your screen for this and in the Q and A box, send your question to Dr.

D'Arpino. "How stressed was this dog?" Let's look at the results. That's interesting. Dr. D'Arpino?

Dr. Sheila D'Arpino:

Yes, thank you so much, Lynne. Definitely some good results there, in that the majority of people are feeling that that dog was "highly stressed", "moderately stressed," and no one said he was "not at all stressed." And I would certainly agree with that.

This dog was displaying signs of fear in terms of approaching and backing away, and approaching and backing away, and dilated pupils, and tense muscles. And he was certainly demonstrating enough physical signs of stress that would make me put him in the "moderately" or "highly stressed" range.

I know these questions are difficult to answer. I would like to have a little more information to really classify him, but my vote for him was that he was “highly stressed.” Thanks for your answers there. We’re going to jump into our next video which is going to ask you the exact same question at the end. This video is much shorter. This is Smiley.

[Video plays from 10:30 to 13:50 to 14:00]

That was Smiley. So, now, we’re going to launch our second poll asking the same questions about Smiley.

Lynne Fridley: And it’s the same questions: “How stressed is this dog? Not at all stressed, slightly stressed, moderately stressed, highly stressed, or not sure.” With that smile on his face, I wouldn’t be sure, either. That was a really smiley dog.

Dr. Sheila D’Arpino: *[Laughs]*

Lynne Fridley: Please answer on your screen. And we’ll see how Smiley faired with the results.

Dr. Sheila D’Arpino: All right, well, Smiley’s results are kind of all over the board. I think the highest number of people said that he was “not at all stressed” or “slightly stressed” based on our survey respondents. But some people felt he was “moderately stressed” and some felt that he was “highly stressed.”

These two dogs, you probably notice the big gigantic collars around their necks. They were part of a custody case and had been seized from a home where they had had a lot of trauma in their previous home and were part of a dog fighting situation.

I would have put, by watching this video, Smiley in the range of “slightly” or “not at all stressed.” I probably would have put “slightly” because, for me, just the fact of being in the shelter, almost all dogs are going to be a little bit stressed. But, who knows? For Smiley, this may be the best life he’s ever experienced.

Unfortunately, he had that name because part of his lip was removed in a dog fight and that’s why he looked like he was always smiling. And the shelter tried to turn the negative into a positive by giving him a good name around it.

The reasons that I feel that Smiley is a lot less stressed than the first dog is, number one, you could see a ball right between his front feet, and most

dogs aren't going to play ball when they're stressed. So, that gave me a hint and I guessed that he probably wasn't that stressed.

Some dogs might, but most aren't going to do any significant playing while they're stressed. The other thing we could see in that video was that his hind legs were laterally underneath him, meaning they were directed out to the side instead of tucked underneath him, and that is a relaxed and comfortable body posture.

And that doesn't mean it's out of the question that it's a stressed dog to display that posture, but that is a posture that I'm more likely to associate with a dog who isn't super stressed. As long as he's healthy otherwise.

He was also panting, and panting can certainly be a sign of stress, but panting can be a sign of other things, too. It can be a sign that he's hot because he was just playing fetch for quite a long period of time. So, there's a lot of reasons that a dog could be doing different behaviors, but I think most of us are in agreement.

And if this is something you want to look at and learn about more in terms of behavior and body language, there's lots of resources out there. The ASPCA and the Center for Shelter Dogs have some great ones about body language and stress.

I'm going to do a Pulse Check here. Does this all make sense to you? If you're a bit confused, give me a thumbs down, if it makes sense, give me a thumbs up. And just a reminder, as we're looking to see how everyone is feeling about what we are talking about so far, submit your questions to the Q and A area if you have them and we'll discuss them during the first break.

And it looks like we are in really good shape here, in that I don't see any thumbs down. That's great news. I hope that continues.

All right. So, now, some of you may have seen this slide come up and say, "Oh, goodness. This isn't what I wanted to learn about." I think it's important to learn about the underlying mechanisms of stress and why and how they happen because that helps us to understand why we see some of the side effects that we do in our dogs.

And you'll see a lot of humans in these slides because they don't make many dog slides with the same type of pathways, but our stress response is the same. We've talked briefly about external signs of stress, now we're going to be talking about our body's internal response.

I'm going to try to make this as painless as possible, but it's really important and that's why I want to share it. When we are stressed like that

Spaniel was with the picture of the Vizsla that you saw, our fight or flight response is activated. And it activates two main stems in our body.

The system on the left, you see it saying that big long word “Sympathomedullary Pathway” or the “Sympathetic Nervous System.” And on the right, you see the “Pituitary” – pituitary is in the brain – and the adrenal – which is right above your kidney system.

We have these two main systems that are activated in our body when we’re stressed. The Sympathetic Nervous System mobilizes our body to produce adrenaline and noradrenaline or – also known as – epinephrine and norepinephrine.

And it mobilizes our body to increase our heart rate, increase our respiratory rate so our breathing is faster. Increase our blood pressure so we can produce energy and respond to that stressful circumstance and deal with it appropriately. That was the left side of things, the Sympathetic Nervous System producing adrenaline and noradrenaline.

The right side of things, the Pituitary-Adrenal System. The pituitary gland in our brain sends signals down to the adrenal glands and causes the release of cortisol. You can see that blue corticosteroid is highlighted there. Corticosteroids and cortisol are the same thing. And these are what many people call our stress hormones.

Cortisol mobilizes the body to produce energy and it moves resources away from other areas of the body like our immune system, which is a pretty important system. That’s a very quick and dirty summary of how our stress systems work. When we’re assessing shelter dog stress, we can look at behavior but we can also look at these physiological signs.

There are lots of other things that can cause stress – Sorry, yes, there are lots of other things that can cause stress, but there are lots of other things that can cause physiologic signs of stress. So, we just talked about increased heart rate.

And that increased heart rate might be due to exposure to something stressful, but it also can be because we’re exercising and having fun and that is why we’re experiencing an elevated heart rate. If we’re trying to assess stress in pets and ourselves, we need something that is more specific that allows us to more specifically identify, is this pet truly stressed?

We can look at lots of different byproducts and factors in the body that we won’t be talking about today, but we can look at levels of cortisol in the body. So, you can see that that pituitary system produces cortisol and we can look at those levels of the cortisol.

We can compare the levels of cortisol to the levels of another substance in the body called creatinine. Creatinine is a byproduct of muscles metabolism and it's created by the kidneys at a regular rate. And we can look at the ratio of cortisol to creatinine in the urine to assess stress.

And this cortisol to creatinine ratio, as we call it, is not to be a highly reliable assessor of stress by most experts. There's not 100 percent agreement on it. I don't know if there's 100 percent agreement on anything, but most people agree that's a pretty reliable indicator that a pet is stressed, is looking at that elevated cortisol to creatinine ratios. It's really important to note that cortisol to creatinine ratios are not highly correlated with behavior. So you would think that you would see high levels of behavioral signs of stress associated with this high cortisol to creatinine ratios. And that hasn't been found to be true.

My opinion on that is that it's likely due to the different behavioral manifestations of the stress. So, when I stress, I'm often times very quiet. So, I'm not like a dog that's jumping all over the place. And because there are so many different behavior signs of stress, that's probably why we can't find a strong relationship – or it's my opinion. I don't have research to back it up, why we can't find a high association between the two.

The bottom line is that things are pretty much impossible to measure on a day-to-day basis are the most accurate measures. So, we can't be going and getting this cortisol to creatinine from the urine on a day to day basis with our shelter dogs. So, it's a valuable tool when we're doing research, but it's not a valuable tool to help our shelter dogs.

So, how do we assess stress on a day-to-day basis? My opinion is that we establish a baseline for that pet and we spend time with them every day, even if it's just observing them from outside the kennel, and look for changes. We look for behavioral indicators, we assume they're stressed when they're in the shelter – we'll talk about that soon.

So, I'm going to do another Pulse Check here really quickly to see how everybody is doing. We're going to jump forward from this slide as soon as we check in. Is this all making sense to you? Green thumbs up. If you're a little confused, red thumbs down.

All right. It looks like we are still in great shape. Thank you everybody for participating in these Pulse Checks. I enjoy seeing how everybody is doing and it looks like we have some people who are a bit confused.

I tried to make this as understandable as possible, but it is a scientific subject. For those of you who have a thumbs down, I do encourage you to type your questions into the chat area to see if we can help you understand it a little better in the Q and A session, or you're welcome to contact me after this is over, as well.

This is another slide talking about the physiologic signs of stress. It's talking about the specifics. You can see them all there in terms of dilated pupils and things like that. And it's important for us to remember that stress causes all of these changes whether it's as a person in this picture or an animal. These changes happen with exposure to acute stress and it's something that our bodies and our dog's bodies –

[Break in audio]

Now, we're going to spend a little bit of time talking about types of stress: acute stress versus chronic stress versus episodic stress. This is important to talk about because these types of stress have different impacts on our body.

So, acute or short-term stress can certainly cause emotional stress, it can cause things like headaches in people. Does it cause headaches in our dogs? I don't know if we know how to measure headaches in dogs, think that's a very interesting concept and I would love if someday we can know that a dog has a headache, but I don't know how to assess that. Stomach and intestinal issues, all the signs that we saw on the previous slide.

Whereas, when we're talking about episodic acute stress, this is acute short-term stress that happens too frequently. So, this is stress that comes and goes and it's characterized in people by people who worry about things a lot and it often occurs in people with a Type A personality.

I don't know if it's more common in certain types of dog's personalities. I think that would be a great topic for research. Lots of great topics for research. We talked about acute and episodic, now, let's talk about chronic stress. This is the one we're really concerned about.

This is long-term, persistent, consistent exposures to stressors, which often times result in behavior changes like aggression, depression, difficulty concentrating, and it's dangerous and unhealthy. What happened to Virgil – who I talked about at the beginning of this lecture – and it's the really, really big thing that impacts our adoptions if we're not on top of things and mismanaging our population.

Next, we're going to talk about different types of stress responses. On the left you can see that our dog was attacked by a dog. That's a stressor.

The dog's response at the top in the green, he may become more cautious or just an increase in behaviors.

So, doing something to make that dog go away. Most people would call that an adaptive response. We have adaptive and maladaptive stress responses. Whereas, if my dog was attacked by a dog and now he panics and attempts to flee every single time he sees another dog no matter what that dog is doing, or he attacks another dog every time he sees it, it's likely that this dog is having worsening stress every time he sees other dogs and this is a maladaptive response.

We want recovery from stress, we want an adaptive response, but often times what we see in highly stressful environments is this maladaptive –
[Break in audio]

What happens when they can't recover? What happens when we have maladaptive responses or we have situations where there's just stress, after stress, after stress and it doesn't go away. We'll be talking about this more later, but often times, we have a vicious cycle of stress and more, and more, and more behavioral changes. And this really influences our adoptions. And we'll be talking about this more as we go on this evening.

[Break in audio]

And we're going to take our first question –

Lynne Fridley: So, we'll take a little break for questions here, Dr. D'Arpino. And we have some good questions in the cue. I'm going to push this first one to the slide area. And we'll go from there.

“Is there research that supports correlation between an elevated cortisol-creatinine ratio at or shortly after intake to the shelter and eventual development of behavior issues?”

Dr. Sheila D'Arpino: There is research that supports elevated cortisol to creatinine ratios at intake to a shelter and that rates tend to decrease over time. I don't know of research related to cortisol to creatinine and development of behavioral issues. I think that's a great topic and there might be some research out there, but I don't know of any of it. That's an excellent question. Wish I had the answer.

Lynne Fridley: Here's another one that's related to that. “Would the cort-creat ratio differentiate between an acute stress and a chronic stress?”

Dr. Sheila D'Arpino: Often times, in most situations that is not going to differentiate between an acute stress and a chronic stress. With chronic stress, sometimes our

whole pituitary-adrenal axis and our whole stress system can get completely out of whack and cortisol levels are not what you would expect them to be despite exposure to a very high level of stress.

I would say that acute stress, they're probably more reliably going to be elevated. But I don't know of evidence that we can easily differentiate between acute and chronic with looking at that urine test.

Lynne Fridley: Okay, thank you. Here's the next question: "Do you have suggestions on getting a valid baseline on a shelter dog? Dogs can burry and hide symptoms. If we don't know what is normal for an individual, it can be hard to monitor."

Dr. Sheila D'Arpino: Excellent question and comment. My suggestions for getting a valid baseline is, number one, the dogs can hide symptoms, but they also sometimes want to hide – physically hide – when they're stressed.

I recommend giving them a hiding place when they're stressed. It may just be a kennel to retreat into. We can even use that as a tool to assess their progress. For me, the ideal way to get a baseline would be to take the dog out of its kennel and get it into a room and spend some time with it, but I understand that most of us are not going to have time to do that.

And in those types of situations when we're dealing with a very large population, I assess – or a small population, but not very much time – I assess by going from kennel to kennel and standing outside the kennel and doing a couple things: just observing their behavior, are they hiding in their hiding place, are they coming forward and saying, "Hi?"

And I also assess whether the dog is interested in taking a treat or taking, actually, just a piece of kibble. Because stressed dogs are often times not going to eat, as we talked about earlier. If he doesn't take that piece of dog food, then often times I'll offer a special treat and I'll continue to observe his behavior and his reactions to environment, as well as me.

And I do that on a daily basis so I can see his progress. I don't know what's normal for him, but I do know what I see on that first day and I can see how that changes over time. It's never ideal when we don't have a history, but we can evaluate changes over time, which is very valuable. I hope that's helpful.

Lynne Fridley: Yes, very. "Should shelters be measuring cortisol levels of their long-term dog populations, or is monitoring behavior enough?"

Dr. Sheila D'Arpino: That's a really good question. I think that the scientist in me says it would be awesome if we could be measuring cortisol to creatinine ratios in our

long-term shelter dogs, but the realist in me says that I would rather direct our resources to spending time with that dog and doing things to attempt to reduce its stress.

Because most pets that are in a shelter long-term are going to be stressed, unless they're pets that have a ton of enrichment and social companionship and don't enjoy being around people that much.

Most of them that are there long-term, - even in really, really good environments – are going to be stressed. I recommend going with behavior.

Lynne Fridley: Thank you. “Would it be advisable to take a dog that seems constantly stressed to a vet to see if it's due to a medical issue? I have a personal dog with Addison's disease, which is treated with medication to control her cortisol levels.”

Dr. Sheila D'Arpino: So, you're asking a veterinarian – And whether to take a dog to a vet, of course, I'm going to have to say “yes.” Thank you for suggesting that. Yes. A dog who seems constantly stressed – Actually, my foster dog, Fin, who's next to me right now is one of those dogs who seems constantly stressed. And that dog does need an evaluation.

Because, yes, stress certainly can occur – as we'll talk about in the next section – due to – and be highly associated with – different medical problems. But it can occur because of medical issues. So, when we're dealing with stress and we can't figure out a reason for it – and even when we can figure out a reason for it – a physical examination to be sure we're doing everything we can for that dog is very valuable. I hope your dog with Addison's disease is doing well.

Lynne Fridley: We have a lot of questions, Dr. D'Arpino. We'll take one more and move on and hold the rest for later. Hopefully, we can get to them at the end.

We will have another break for questions coming up shortly before we get to the end of the presentation.

Here is the next and final question for this section: “Will stress increase in long-term shelter dogs who have little contact with staff members and the public, as opposed to dogs who spend more time in the presence of staff members? I.e. dogs who are segregated from the main shelter.”

Dr. Sheila D'Arpino: Great question. When we're talking about stress, and shelters, and dogs, there's more and more research nowadays. But there's a lot of areas where we don't have research results to back up anecdotal evidence.

But this is one of those areas where we talk about physical contact with people where we certainly do have research that tells us that physical contact of people with dogs reduces shelter dog stress. I don't know whether you're asking about just presence of people and you don't actually have physical contact with them, because that could be more stressful that you see them but can't get with them.

But I can tell you that physical contact is very useful for our shelter dogs and certainly reduces their stress. We want to encourage that whenever we can. Especially in a ____ way. *[Audio break]*

All right. We will go ahead and move on to our next section which is Stress, Shelters, and Personalities. We began by talking about what it is, and now we're going to talk about different factors that affect why we experience it differently.

We all likely know that pets and people can be in a similar circumstance but have drastically different stress levels. My one foster dog is super stressed and the rest of the dogs in my house aren't. And that's what this section is about.

Why are shelter dogs so stressed? This page is full of reasons why shelter dogs are stressed. Things like disruption of routine, diet changes, loud noises, lack of social contact is a big one for our dogs who tend to be social. But remember that every dog is an individual.

Some dogs may not like people, some dogs may not like other dogs. The other big one – and why it's the number one right at the top of the screen there – is lack of control and choice. Being in an environment where you have no control over what happens to you and no choice over what happens to you is a huge source of stress.

And, certainly, something that most of our shelter dogs experience during their shelter stay unless we are employing enrichment programs. All of these are important and I could probably list a lot more that aren't on here.

And that's why the question is not if a shelter dog is stressed, the question, for me, is, rather, how stressed is it and does that stress increase or decrease over time?

For example, a homeless dog with inconsistent food sources before he came to the shelter and other threats, his stress might reduce fairly quickly when he enters a shelter. Whereas a pet dog who was trained every day and got to do agility and was on a good quality diet and had a lot of attention from his family, his stress might increase really quickly in a shelter because he doesn't have any of that in a shelter. We always look at

the dog as an individual and how these environmental factors are affecting that.

Our stress response is pretty darn complicated. You can see the top layer on this side, you can see things like “Environmental Stressors.” For a shelter dog, that can be things like the things you saw on the previous slide: the noise in the shelter, the barking dogs, and all the factors we talked about in the last slide.

“Major life events” I call being surrendered to a shelter as a major life event for a dog. Trauma and abuse. We don’t know about most of our dog’s history and probably less of them experience trauma and abuse than many people think, but that certainly is a factor. So, these are all background factors.

We also – if you look on the far left there – you see “individual differences.” Each one of us – each dog – has individual differences based on their genes, based on their development, and based on their personal experience. These top level things as well as our individual difference drastically affect how we perceive a stress.

You can see that laying over the brain: “Perceived Stress.” Perception is super, super important. Our backgrounds and our personalities strongly influence our perception of things. And I might perceive things as super, super stressful because of my past experiences, whereas everyone else in the world doesn’t think that is a stressful item at all.

Perception is probably the biggest factor that influences our stress response. Hopefully, our perception of that stress and our behavioral response to the stressor that you see there on the right leads to adaptation and a reduction in stress, but that is not always the case.

I’m going to do a quick Pulse Check here as I jump to the next slide to see how everybody is doing. Is everything still making sense or is it getting a little muddy here? Thumbs up or thumbs down. And while we’re getting answers there, I’m going to talk in a little more detail about an adaptive stress response.

In an adaptive stress response – In this example, our perceived stressed and our stressor is a shelter stay, in this situation. We might see behavior responses like attention seeking behavior and barking that also produces physiologic response in the body. And a stressor produces those physiologic responses.

And if those things may very well work to reduce our stress and we recover from that stress. This is an example of a situation where you have an adaptive response and a recovery.

And looking at our Pulse Check, we're getting more people who are a little bit confused by everything. But still, the vast majority of people are in pretty good shape, which is great. I'm going to close out our Pulse Check here for now and just remind you to type your questions into the chat area if there are specific things you'd like me to talk about in more detail.

This is an example of chronic stress and a loss of coping mechanism. This example is of a long-term shelter stay. We might have some of similar behaviors like attention seeking behavior, barking, and anxiety. And we might still have our physiologic response, but it also might be different at this point in time because of this exposure to the chronic stress of being in the shelter and other things that are affecting this dog. This increases our allostatic load.

What is allostatic load? It's basically the wear and tear on a dog's body. It grows over time. When a dog is exposed to repeated chronic stressors like what some dogs are exposed to in shelters. It can result – as you can see on the bottom right – in stress overload. We see lots of physiologic and physical consequences there. This is what we're really trying to avoid.

And the next slide here, you see a stress curve. When you're looking at this curve, stress levels increase as you go to the right looking at that bottom long arrow or axis. And "Humanness" is a slide based on people, but like I said earlier, we can extrapolate most everything to dogs.

That's a slide of "Performance." Performance is probably a little more difficult to evaluate in our dogs, but the purpose of this slide is to highlight the fact that that area on the left. You look on the right, a little bit of stress is normal and with no stress we can be inactive and bored, as it says there.

But when we're talking about high levels of stress, we can get sick, it leads to maladaptive behaviors, decreased ability to cope with that stress, and disease. This is the area we want to avoid.

Stress affects behavior. There's a famous little guy. If you're fans of *Star Wars*, you know that Yoda says, "Do or do not. There is no try." And when it comes to stress and behavior for me, I say, "There is no 'if.' There is only 'how.'"

And that stress is there. We've separated them from everything they know and love, even if it wasn't great, it still was something that they likely had been comfortable with over time.

Some dogs who've lived in horrific situations don't feel comfortable in a very enriched environment because change is a stressor, environmental change is a stressor. My big question is, how much are they stressed and what can we do to help them with it?

The next video that we're going to show illustrates the effects of stress on behavior very clearly. Let's watch Benny, a lucky dog who was adopted from Carson Animal Shelter in Gardena, California.

[Video plays from 46:05 to 47:57]

I don't know how many of you have seen Benny's video. Someone shared it with me a couple of weeks ago and I thought it was just such a wonderful example of, number one, a happy dog. But, number two, of the effects of stress.

Because we see Benny scared, scared, scared, and stressed, stressed, stressed. And then, once he gets out of that kennel, he is jumping for joy and also getting his self out of that area and those barking dogs as quickly as possible. And this dog, for me, just brings home the point of the effect of stress on adoptions so much because people tend to want a dog that seems to like them, that comes up and says, "Hi."

Benny was unable to do that because he was so stressed and scared. Luckily, someone overlooked that and adopted him anyways, or the shelter was smart and it introduced him in a way where he wasn't as fearful. This is an example of where stress did not influence adoption, but Benny was lucky.

A lot of other dogs don't have that same benefit and just stay there scared in the back of their kennel and don't receive any help and don't get adopted, which is a huge shame. But Benny is a wonderfully happy story and I wanted to share the quick change from terrified, terrified dog. It was that environment that was causing Benny's stress. He probably has a personality that has a tendency towards fear, but as soon as he was out, he was a different dog.

I'm going to quickly talk about stress and disease because the other way that stress really impacts our adoptions is through disease. We're going to revisit cortisol because stress activates our pituitary adrenal system and cortisol and that weakens our immune system.

It makes us more susceptible to many diseases, like are written on the screen. This is really related to people diseases. Our body is unable to fight off disease as well as it normally can when we are stressed due to our weakened immune system and it makes dogs more susceptible to things like kennel cough, Parvo, skin problems, and even things like Distemper.

We are going to take our next break – Oh, sorry. I forgot. We have a poll here.

Lynne Fridley: Yes, we have a poll here about hormones. “What hormone has most often been linked to behavior changes and occurrences of disease? Adrenaline, estrogen, cortisol, cholesterol, endorphins.” Please choose a choice here on your screen.

What hormone has been most often linked to behavior changes and occurrence or diseases? And we’ll quickly go to our answers here. Cortisol.

Dr. Sheila D’Arpino: Yay.

Lynne Fridley: That takes the ticket.

Dr. Sheila D’Arpino: Thank you. *[Laughs]* Thank you, Lynne. Yes, cortisol – our stress hormone. Adrenaline and epinephrine is one of our stress responders, but cortisol is the correct answer here. Good job.

Lynne Fridley: We have a break for questions and we do have some good questions lined up for you. Let’s take the first one. “Exercise and human contact. Is that good practice?”

Dr. Sheila D’Arpino: That’s an easy one to answer. Yes. We know human contact is great.

We’re going to be doing another webcast in the future, in a couple months, that we’re going to be talking about enrichment and things that we can do to reduce stress.

The focus here is really, what is stress and how it affects us? But exercise can certainly reduce anxiety, it certainly can reduce stress in people, and I know that it can help dogs. So, yes, those two things are –
[Break in audio]

Lynne Fridley: Okay. “We have a policy of holding strays two weeks before bringing them into our adoption program. During this hold period, we’re not allowed to take the dogs outside for walks so they receive little exercise and human contact. Is that good practice?”

Dr. Sheila D'Arpino: In my opinion, that is not good practice, in that if we are not getting many of the dogs. Even if we don't know their backgrounds, many of the dogs that come to us are house trained. And besides the fact that they're not getting people contact, they're not receiving enrichment in many of these situations. They're not able to maintain house training skills.

These are things that can potentially make stress levels get higher and higher and make things very challenging for how we manage our population. I really, really strongly recommend the development of programs and talking to your shelter leaders about the effect of stress on your population so you can change your policies and provide better welfare for your dogs.

Lynne Fridley: Thank you. Here's another question. "What kind of body language and type of speech or talking should we have as humans approaching a stressed dog in its kennel to lock it or let it out, etcetera?"

Dr. Sheila D'Arpino: Body language and type of speech talking. Body language – every dog is different, so different dogs are going to appreciate different things, but many stressed dogs are often times very scared or ready to start a fight with us.

We want to do everything we can to reduce our appearance of wanting to fight with them. That is doing things like not approaching them direct on. Standing sideways instead of facing them directly, not having direct eye-contact, sometimes crouching a little bit so that we're not so high and above them. And speaking gently to them, not speaking super, super loud, not speaking in a squeaky high voice because that can scare stressed dogs.

But speaking in a gentle voice – often times a normal tone of voice – because if you speak quietly in many shelters, the dog is not going to hear you.

Lynne Fridley: This is a good question: "So, it seems even more compelling that behavioral evaluations are far more accurate as to how the dog would be in a less stressful environment like a home. Seems like strong evidence to transfer to a foster home."

Dr. Sheila D'Arpino: Very interesting comment. We do have evidence that the behavior evaluations that we use are not highly accurate. It gives us a picture at a point in time and that's what most of the people have developed these evaluations will tell you. That it gives us a snapshot at a point in time so we can know how to best address the concerns that we find.

And, likely, a foster home can potentially be stressful, but in most situations. A foster home is going to be a lot less stressful than a shelter environment and that's why I really strongly encourage foster care. Especially when we're talking about long-term stays.

I see huge differences in dogs who are – I haven't been able to keep them in my home for a long time, just two weeks – but I get them to my house for two weeks and it just changes their world. And then we put them back in the shelter and they get adopted. So, yes, yes, yes. Foster homes.

Lynne Fridley:

We'll take one more question in this segment. It looks like we're going to run a little bit over, folks. I'd like to keep you all on the air because we do still have some good questions that Dr. D'Arpino can address at the end.

We're getting close to the end, but we're probably going to run over the hour. So, please stay with us. Here's our last question for this segment: "Should play, with people and or other dogs, be utilized to reduce stressed? Can it be a measure of reduced stressed? Particularly in fearful dogs."

Dr. Sheila D'Arpino:

Great question. And I don't know of research that supports this, I would love to see research on it, but play is something that is often times – A dog who is playing is not a stressed dog unless he is playing with someone who is causing him stress, I suppose.

Play, because it provides social contact, it provides physical exercise, it's a great way, in my opinion, to reduce stress. As long as that play is being managed appropriately. I would love to see us be able to use it as a measurement of reduced stress. Someone needs to do that research.

All right. Thank you for these excellent questions. I'm going to move on as quickly as possible. I apologize for going over, but we've had some excellent questions so far. I'm going to spend this last little bit of time talking about stress and welfare. I hope it's not too stressful to be learning about stress today.

I know a lot of these concepts can be very complicated, but they're important to know about. This is our stress brain loop. I have this slide up here because that little box in the lower left corner is really, really important.

With chronic stress, we have a decreased ability to pay attention, to perceive and understand things, we have a decrease in short-term memory and learning. If you're wondering if and how stress can – and especially chronic stress – can affect our shelter dogs, there it is right there.

A big huge factor. Behavior problems are exacerbated by stress. Given what you've learned so far today about what you've learned on effects on behavior, learning, and memory, this slide shouldn't be very surprising. But it's really important to really acknowledge. Anecdotally, I've worked with many dogs.

Dogs like Virgil, who I talked about at the beginning, who didn't seem to have any problems when I first met them. But long-term, even trying to do everything we could to reduce stress, the stress of being in a shelter and not in a home with a person turned a non-existent or a mild problem that we couldn't even detect into a big one.

I can't talk about stress without talking about length of stay because we have a vicious cycle here, in that the longer we're in the shelter, our quality of life potentially decreases. That causes our dogs to display unappealing behavior.

And it's just this cycle of the more stressed, the more behavioral challenges we have and that makes us stay in the shelter longer because no one wants to adopt us. There's a great chapter in the *Shelter Medicine* book that you can see there on the bottom about quality of life, stress, and emotional pain by Dr. Frank MacMillan that I encourage you to read. Welfare. What is welfare? One definition is the balance of positive and negative experiences. We want to maximize positive experience for our shelter dogs while minimizing the negative. We want to maximize positive affective states and minimize negative affective states.

I hope you're not sitting there saying, "Woah, affective states. What the heck are you talking about?" When I'm talking about "affect" I'm talking about the experiencing of emotions and feelings, which our dogs certainly experience. And when I'm talking about a positive state, it's the extent to which we experience positive moods.

And when we talk about negative affective states, it's the extent to which we experience negative emotions such as anger, fear, and nervousness. It's really important to remember that the absence of negative experiences isn't equivalent to good welfare because we need to be having some of those positive experiences to be bringing us happiness and joy.

And I don't think we know how to measure happiness in dogs, but I know dogs experience happiness and those positive experiences are super, super important. Because if all we have is negative, we don't have much of a life.

What about evaluating a population of dogs? On an individual basis, I recommend comparing today's behavior to previous behavior. How is

that changing over time? On a population basis, it can be really valuable to evaluate the entire population of dogs who are in your care.

We can use a welfare assessment protocol like you can see here on the screen. This is one that is being developed and validated and has a very nice protocol that you can use to evaluate your shelter dogs. You can get the aid of a professional group like the University of Florida or UC Davis or Humane Network to evaluate the welfare of your dogs.

But you want to be looking at things like housing. What conditions are they housed in? This picture is a situation where the dogs might look happy but they're pretty overcrowded. These dogs are just thrown in together without concern for behavior and there's a lot of stress in this shelter.

We can look at disease levels, cleanliness, enrichment, what type of enrichment is being provided. We can look at things like do dogs go on walks every day? Great form of enrichment for dogs and can drastically improve their welfare because it gives them sensory enrichment in terms of all the sensations and smells that they're experiencing outdoors.

Physical enrichment in terms of exercise, mental enrichment in terms of all that brain power they're using sniffing the ground and engaging their brain – not the grain. And it gives them a small degree of control if we allow them to choose a little bit where they're looking around and where they sniff. That gives them a little bit of control over their life which can be a really powerful thing for them. I love dog walking programs for shelters.

Is experiencing stress worthwhile? This is a big question, right? Is it worthwhile if it results in saving a life? This is really important and my answer is "yes." If we're actively doing something to help and actively working to improve their welfare and circumstances, I think experiencing some stress is worthwhile if it results in saving a life.

But if that stress is resulting in problems that then decrease the likelihood of adoption like we've talked about so much through this lecture, then we need to take drastic action. Because, in this situation, the circumstances and the housing and the situation that we're providing are likely resulting in that dog's death. In my opinion, that's just not fair to the dog.

What can we do to help? We'll be talking about this more in a webcast in a few months and there are lots of webcasts out there on enrichment and stress reduction that I encourage you to watch. You can see some of the options here. I look forward to seeing some of you in the webcast – I believe it's two months ago – to talk more about this. At this point in

time, I think I'm going to end it here and we're going to take some more questions.

Lynne Fridley: Yes, and we have some good ones lined up for you, Dr. D'Arpino. Here's our next question: "Are there meds that can be used to reduce stress?"

Dr. Sheila D'Arpino: Yes, there are medications that can be used to reduce stress. Things like lavender can have a calming – lavender oil, not necessarily a medication, but lavender oil. The scent, can have a calming influence on dogs.

Medications. There are behavioral medications that can be prescribed by veterinarians that can be used to reduce stress. Trazodone is one of my favorite medications for shelter dog stress because it tends to help to reduce their stress without a lot of side effects. But there are a number of different things that we can try.

I do recommend – very strongly recommend – going to the route of enrichment, and foster homes, and everything we can do otherwise if and when we can. But if all that is failing and we still have high levels of stress, addressing that stress is crucial to me. And those are situations where I feel it's our duty to use medication. Because we're acknowledging that the environment isn't ideal and we're doing our best to help our dogs.

Lynne Fridley: Thank you. Somebody is asking about fostering. "But can't fostering a dog and then returning it to the shelter also increase stress?"

Dr. Sheila D'Arpino: Really good question. Someone just emailed me about this topic earlier today and it almost makes me wonder if the question is from her. I don't know the answer to that. That is an excellent question because some people are very concerned that it can.

My opinion is that getting them out of the shelter for even one day can be such a positive experiences for them that I feel that it's worth it. But it's also really going to vary from dog to dog and personality to personality. Because is the stress of going back again going to be so horrible that it's just going to make them give up and be really depressed?

I don't know, but I do know that I have, anecdotally, seen many situations where fostering gets the dog adopted and that's great. Or fostering allows them to start feeling like a normal dog again and so that they then get adopted. But a great topic for research.

Lynne Fridley: Thank you. "What can be done for long-term residents that develop spinning behavior in their kennels even though their getting walked?"

Dr. Sheila D'Arpino: This is a topic we could spend hours talking about, but a big thing that you need in this situation, in my opinion, is environmental change.

I've had situations where dogs that have been in that situation and spinning for a long time in the same environment get transferred to a different shelter. And that shelter is doing similar things to what happened at the previous shelter, but just being in a completely new environment can change things up for the dog. And that spinning behavior can go away.

It's important to remember that that spinning behavior is often times a coping mechanism. It's how that dog deals with his stress, but it's not going to get him adopted in most cases. Environmental change can be a huge factor, getting them into foster home can certainly sometimes help in these situations. In some situations, nothing works. In some situations, medication works. You just have to try different things and try different things and not give up.

Lynne Fridley: Maybe this will work. "Can soft classical musical music help reduce stress in a shelter?"

Dr. Sheila D'Arpino: There certainly is research that was done a while ago now that demonstrated that soft classical music can reduce stress – I'm sorry, I shouldn't have said "can reduce stress" – Can result in calm behavior in shelter dogs.

Do I know that that reduces stress? I can't say that with certainty, but you can probably equate calm behavior with reduced stress. Yes, that is a good thing to try, but remember that change is important.

Because if you're playing the same music over and over, the dogs get habituated to it and don't listen to it any more. Soft classical music is good, but you also want to change it up and change the – can't think of the right word – change the person who made that music so that you're getting different experiences.

Lynne Fridley: Here's something that's interesting. "When I was in vet school, the teaching dogs did a lot of spinning. I put a DAP plug in the kennel area and they literally stopped spinning overnight."

Dr. Sheila D'Arpino: Wow. That is really exciting. And I haven't had as good experiences with DAP as you have. I haven't had negative experiences with it, but I haven't had a lot of situations where it's helped. But maybe I haven't tried using it enough because that is very exciting news.

For those of you who don't know, DAP is Dog Appeasing Pheromone. It's something that you can put on a dog via a collar or a plug-in into the wall – similar to Feliway in cats – that is supposed to help to reduce dogs' stress. Certainly something to try.

Lynne Fridley: “Can using Thunder Shirts in the shelter be a good way to reduce stress?”

Dr. Sheila D'Arpino: The idea behind a Thunder Shirt is that it wraps the dog very securely and that security helps the dog to feel comforted and reduce their stress. We did a short pilot project with this when I was at the Center for Shelter Dogs and we didn't find a significant effect using the Thunder Shirts versus not.

But it is one of those things like DAP, it doesn't hurt to try. But once again, remembering that if you have the Thunder Shirt on the dog all the time, he probably is going to become habituated to it and it's not going to be effective anymore.

Lynne Fridley: “Does one badly stressed dog affect the other dogs who seem less stressed and trigger more stress in them?”

Dr. Sheila D'Arpino: Really good question. I can only answer this anecdotally. I can tell you that when I'm making videos for lectures or things like that and I play a stressed dog's barking when I'm making that video, all of my dogs and look at me in a very concerned way.

And if I play a video of a happy dog barking, they ignore it. Dogs do speak to each other via barking and if that stressed dog is barking like they often times do, yes, he can certainly affect the other dogs.

He can also affect the other dogs in many different ways, depending on how he has contact with. But even not having contact with them, there can be odors that they can sense that could potentially make the other dogs more stressed and it's my opinion that that was one of the things that was causing stress in Benny, the dog that we watched early. All those other stressed dogs were making him really stressed. Could be wrong though.

Lynne Fridley: “We have a long-term shelter dog that's very fearful of people, especially strangers. The managers have decided to limit him to certain staff members. So, he is only being socialized by the same two people every so often. Is this hurting him more?”

Dr. Sheila D'Arpino: When we are working with fearful dogs, often times when we begin working with them, I do recommend working with just a small

number of people so that that dog becomes comfortable with a limited number of people. Because exposing that dog to lots of people when he's very fearful is very overwhelming.

Initially, a small number of people is great, but if you're trying to really help that dog, you want to gradually be exposing him to more people over time. That means, if necessary, educating staff about dog body language and how to behave and help a scared dog so that the dog can gradually become comfortable with more and more people.

Over time, is it hurting him more? I don't know if it's hurting him more. I'd say it's definitely hurting him just the same because my feeling is that if we're not doing something every single day thinking, "What can I do to help get this dog adopted? What can I do to change things that we are hurting him and potentially putting him in a downward spiral so that he gets more and more stressed?"

It's really scary when you have a fearful dog and you're worried about them behaving aggressively to expose them to more people. And that's why education programs from our staff and volunteers are so important.

Lynne Fridley: "How about office fosters for dogs that can't be placed in foster homes? The staff will bring a dog into the quiet area of his or her office for a few hours a day."

Dr. Sheila D'Arpino: That's a great idea and that's something that we often did when I worked at the Animal Rescue League of Boston. I had a shelter dog in my office almost every single day and I loved it. That gets the dogs out of the kennels and it gives them time to relax.

There certainly is evidence that shows that one of the best things for shelter dogs might be just time to relax and not necessarily active, running type enrichment, but just time to be quiet and calm and relax. When you're stressed, we all need that, right?

Some people like a lot of exercise and it's really good for us, but having that quiet time is invaluable. Office fostering is great if you have the office space. Sometimes it even means just keeping them behind a counter with you. Just giving them a little time.

Lynne Fridley: "Where can you get a DAP plug-in?"

Dr. Sheila D'Arpino: You can get a DAP plug-in at most pet stores. It's sold under a variety of different names, but basically, you're looking for the pheromone plug-in for dogs. It's not going to be called DAP. In the past it was

Comfort Zone. And I can't remember. I haven't used it in a little while so I can't remember if it's still called that.

Go to your local pet store and you can find them there. You can also certainly find them online. Look for pheromone plug-in. The pheromone is what is in the DAP that helps to reduce stress.

Lynne Fridley: Okay. So, we're going to take one more question and then we'll end for the evening. Any questions that Dr. D'Arpino hasn't answered will get up on our website in a Q and A format. Here's the last question: "What are your thoughts on the trend of group housing for dogs in large playrooms? Similar to a doggy daycare setting."

Dr. Sheila D'Arpino: My thoughts about that are it depends. I do like the idea, but I have some cautions about it in that putting many dogs together without thought for behavior can increase – can make a couple dogs really happy and a lot of other dogs really unhappy.

Because stress levels can be really high if we're not managing these dogs and matching the groups so that similar types of dogs who actually enjoy being together are actually put together. And we also want to make sure that they're all getting some downtime.

Most dogs don't want to play all day long. Do they have relaxation time and downtime where they're not allowed to play? I do like the idea in general. I think there are a lot of potential benefits, as long as it is very carefully and cautiously managed related to dog personality, as well as safety. In terms of avoiding dog fights.

Lynne Fridley: Excellent. Thank you. I want to remind the audience that we do have other resources on our website. One of those is a learning track which has many different components and it's on enrichment and stress reduction for dogs. Just got to www.maddiesfund.org.

That's the end of our event. We want to thank Dr. D'Arpino and all of you for your time tonight. We invite you to take a few minutes to complete our survey. Your feedback is important to us. Click on the link on your screen. If for some reason you do not see the link, it's also in the Resource file. The link will also be emailed to you in a few days.

This webcast will be available on-demand shortly and we hope you will share this presentation with your colleagues and on your social sites. Please take advantage of our free on-demand webcasts available on our website at www.maddiesinstitute.org and plan to join

us and Dr. D'Arpino on February 4th for a second installment in this series: How Stress is Sabotaging your Cat Adoption Efforts.

Attendees will learn the role of stress and welfare on health, disease, and well-being in cats in shelters and rescue groups. We look forward to seeing you then. Thanks for being here with us this evening and goodnight.

[End of Audio]