



Feline Leukemia Testing: One and Done for Everyone – Webcast Transcript 12/15/21

Thank you for everybody who's here already everyone who's still logging on, let me do some quick introductions and housekeeping before we get started.

My name is Monica Frenden-Tarant, and I am joined in this webinar by someone who needs absolutely no introduction to anyone on this call the amazing Dr. Julie Levy, and we're going to be doing Feline Leukemia Testing One and Done for everyone today.

And thank you to our hosts for this webinar Maddie's Fund, we've got Alison Gibson up on screen who's going to be helping behind the scenes of running the tech snafus we run into. And we have Cameron Moore with Million Cat Challenge who is your moderator for this webcast, she's going to be managing all of the questions that people submit. So if you have a question, please put it in the Q&A box down on the bottom of your screen, not the chat. The Q&A will help Cameron keep them sorted and keep us on track so, Dr. Levy I can answer as many questions as we possibly have time for. And we know that you have lots of them hopefully our webinars going to answer some of them for you.

Alison is also going to drop in a link to the chat for the [Maddie's Pet Forum](#), if you do have questions at the end of this that Dr. Levy and I have not been able to answer please go to that Maddie's Pet Forum link, and we will continue this conversation there and you can all engage with each other and talk about the greatest cats in the world, our FeLVs. I think we are good to go and get started, does that sound good to everybody.

Right. So Feline Leukemia Testing One and Done for Everyone, let's see if I can get my screen to cooperate There it goes. Okay. Really quick update before we get into everything that we're going to talk about and overwhelm everyone and confuse everyone along the way.

Here are some quick updates for 2021.

We know that there's a 2% to 4% prevalence in the United States for feline leukemia. And you can see on that map how it varies a little bit. Not surprisingly, higher rates of it in the south. I think because the Northeast has done a lot more spay and neuter than in the South.

It is not possible to determine a cat's infection status based on testing at any single point in time with any test. That was a big revelation that all of our studies, kind of really cemented was

that the feline leukemia infection may ebb and flow over time, it may change and any test is a snapshot of what is happening in that cat today, it can change.

We know that leukemia positive cats can be safely housed, sheltered and adopted with great success. I think the fact that we have almost 1,400 people registered for this webcast is indicative and proof of the statement that feline leukemia cats can be housed, sheltered and adopted with great success.

The fact that there are so many of you registered for this is beyond humbling and it tells me that people care. People care about leukemia cats so if you think you can't do this, you can remember this, that this many people, including nearly 700 vets are registered on this call.

We can do this, there is demand for these cats, we know we can do it.

Leukemia adoption programs in fact are now the norm in shelters, that's a huge change, but it is now the norm to be adopting these cats out.

We're going to talk about this a little later, we still don't know how long a naturally infected feline leukemia cat lives. We can't say what their average lifespan is but I promise you that we're working on it.

On the foundation of the giant study Dr. Levy and I started in Austin four years ago, we are still tracking those cats and how they're doing and we're working on.

We're going to get you a better answer, but we do know that for a whole lot of them they're doing really well, years down the road.

Lots of shelters are not testing for feline leukemia anymore at all.

And we're going to talk about why that is but it's okay, so if you're one of those shelters who's not testing at all. It's okay. We will support you in that. What we can absolutely reiterate, though, without argument without controversy there's absolutely no reason, we should be euthanizing a positive cat based solely on a blue dot. We can absolutely guarantee you that.

Retrovirus management guidelines have changed last year, the AAFP came out in 2020 with updated retrovirus testing guidelines, important takeaways from that was that FIV and leukemia testing is optional in shelters.

Recommendations for tests. We recommend that cats who are co-housed be tested and cats who need a diagnostic. But standard testing, blanket testing for everybody at intake may not be required for everybody, anymore.

The AAFP guidelines started classifying a feline leukemia infection into categories, these stages of feline leukemia were documented and they got broken down into abortive, regressive or

progressive, and that was new and we're going to explain what those on mean on the next slide.

We know that discordant cats move between those stages. So, for everybody on this call, you've probably gotten those cats who I'm positive this day on this test and negative the next day on that test and I'm back and forth, that's a discordant cat. Those are pretty common.

Because testing is confusing expensive, and each cat's situation is unique, the AAFP, Dr. Levy and I, all say now that the best recommendation, our new recommendation for shelters, is a simple one and done testing approach, and you can get those AAFP guidelines at catvets.com (<https://catvets.com/guidelines/practice-guidelines/retrovirus-management-guidelines>)

All right, we're going to start getting into the nuts and bolts of things here. So here are the stages of feline leukemia, that are classified under the AAFP guidelines and there's a couple more stages that get even trickier but we're not going to talk about them for the sake of getting this done in an hour today. These are the three most common stages that you're going to come across in shelters or in practice.

The abortive stage. This is great. This is the one that we would all ideally like. An abortive infection occurs when the cat's immune system eliminates the virus prior to proviral DNA integration in dividing lymphocytes. Cats with abortive infections do not shed infectious virus and do not develop clinical signs. For all intents and purposes these cats have gotten rid of the virus. They beat it entirely, it's not detectable, it's not infectious. They're pretty negative or entirely negative

The regressive cat. Now we start getting into tricky things. A regressive cat has controlled the spread of the infection prior to secondary viremia. And this is somewhat new, these cats are at a reduced risk of shedding the virus and developing feline leukemia related disease. Reduced risk, not no risk.

Although these cats may have or eventually clear viremia the feline leukemia pro virus is integrated into the cat's genome, it results on a lifelong infection, the Leukemia pro viral DNA can be detected in the blood by PCR.

So in those regressive cats there's no antigen or cultural virus present in the blood, the virus is not shed in saliva after these cats have undergone initial infection and their immune system has for all intents and purposes suppressed the virus.

When a cat is regressive the cat is not infectious to other cats, except by a blood transfusion or if reactivation occurs.

Now the progressive cat. This is the other end of the spectrum account with a progressive infection has undergone infection in the bone marrow and a secondary viremia and is at

increased risk of shedding the virus and developing FeLV related disease. Those cats have shorter survival times and commonly succumb to leukemia associated diseases.

So those are the three big stages abortive, regressive and progressive.

Hopefully we haven't lost anyone just yet. Doc I think this is your slide.

So that's a lot, and that's what we try to teach our veterinary students, and even they have some challenges absorbing it all and remembering it over time and based on what I hear from veterinarians.

They also find that to be a little bit complicated and hard to hang onto, so we made this cartoon that hopefully makes it easier to imagine what's happening in the life of a cat with FeLV.

So what this shows is the grey cat on the left, gets exposed to the virus from an infected cat.

And if he has a strong immune response. He can possibly clear the virus completely, that would be the abortive infection, or he may suppress that virus to such low levels that we may or may not detect it.

But even if we can detect these low levels there have low levels of pro virus that's the DNA or and low levels of the antigen, which is what you detect on the in-office tests, and these cats are unlikely to shed virus so they're not contagious to other cats, and they're unlikely to develop the diseases that we associate with viral infection so they may live normal lives, and not be a threat to other cats.

However, if they have a weak immune response at the time of that initial infection. They don't control the virus it spreads throughout the body and into the bone marrow and if it gets into the bone marrow it's going to stay with the cat forever.

And these cats generally have high levels of DNA in the blood that we can detect with PCR and high levels of antigen that we can detect with those point of care tests.

Now all of that and these cats are likely to shed virus, they are contagious to other cats, and they are the ones that we expect, in general, to be more likely to develop a condition like lymphoma our infections that they don't recover from or wasting disease, and to have an earlier death. So these are two ends of the spectrum, however, and what makes it even more confusing is that cats can have a change in their immune system over time, so they can migrate ebb and flow between these two categories.

And that's why Monica said a test in a single point of time does not tell us what to expect for that cat over its lifetime.

There are some cats that are infected and their virus is so well suppressed that we can't detect it, we get a negative test. And there's other cats that initially start out with really high virus that their immune system gets it together and suppresses it later and they become regressive. So this is why this is so hard to hang on to, and it is the foundation of our new recommendations.

So given that, who should we be testing for feline leukemia?

At the shelter, the recommendations are that we're testing co-housed cats and kittens.

As a diagnostic, certain sick and injured cats and kittens should be tested.

You can go ahead test everyone if it makes sense for your organization in your community. And what I mean by that is we saw what the prevalence of leukemia was in the United States, 2% to 4%.

So if you are spending \$30,000 a year to test every cat, and you get a handful a year, and we understand that feline leukemia can be safely contained in the shelter and it's not easily spread amongst cats who are not cohoused and cats who are neutered. Does it make sense to be spending \$30,000 a year to catch a handful of cats, if that money can be better spent towards feline lifesaving in another way at your organization.

So what I like to tell folks and shelters, is that if you are doing really good in your community, all the cats are safe and you're you want to test everyone to provide better care, go ahead and test everyone, it's not going to hurt.

If you are a shelter that is struggling and you are low on resources and you could apply that money towards more proactive things like robust targeted TNR and spay neuter that might be a better use of your funds than blanket testing, everyone, and it is perfectly okay for your shelter to say we're not going to blanket test anymore we're only going to target test or test when we need to instead of testing everyone.

So you can absolutely do that if you're going to do that though we still recommend that you test co-housed cats and use that tool as a diagnostic to improve welfare for cats.

And of course, there are shelters, a lot of your transfer partners that require a test prior to accepting the cats, so we understand that too.

If you are a cat owner, everyone, you should test your cat via private practice before especially before introducing it to another cat. In fact, feline leukemia lends itself and all retroviruses lend themselves really well to that client patient relationship, that long term relationship that the pet and the owner and the DVM have in private practice so that can be successfully managed over the life of the cat in an in home like environment.

So, testing in the shelter is also very expensive. No matter what brand you use, it is very expensive.

It's also a snapshot in time, so that test result that you get today at the shelter on intake may not be telling you anything other than what's going in that cat today, if the cat was exposed to feline leukemia within the last 30 days that test may not pick it up.

You may you all you ever I'm certain that everyone on this call has gotten some sort of wacky test result which is why you're on this call looking for answers.

So you're familiar with like that one test may not tell you what's going to happen tomorrow.

We know that leukemia transmission is very easily controlled through simple measures and routine cleaning. I like to talk about this as a very weak virus, outside of its host it dies in the environment within minutes.

It is killed by the most common of cleansers This is not panleuk, this is not parvo this is not Covid. This is feline leukemia and it is a weenie of a virus outside of cat.

You are not going to pass it on easily through contact it's not through fomites, it takes prolonged intimate contact between cats to give feline leukemia, or mating.

So you aren't going to get it just by simple contact you're not going to pass feline leukemia on your hands as a shelter worker on your shirt. It's not happening.

Dr Levy to put out a famous study years ago that I call the chain link study specific setting and chain link fence is enough to prevent transmission between feline leukemia cats.

And so we've known this for decades. I know a lot of us are afraid and we've got fears of spreading leukemia, but it's time that we embrace science and acknowledge that it is not easy to spread feline leukemia that's simply not how the virus works, it can be contained.

Okay, so what's not changed in these 2020 AAFP guidelines.

In AAFP nothing has changed. It is still safe to house, care for and adopt these cats out.

We agree it's easily controlled with common sense precautions.

The leukemia vaccine remains effective, we know that, but we still do not recommend it as a core shelter vaccine.

And Dr. Levy, if you do want to if you want to comment on what you do think it's appropriate.

Again, I would say, only in private practice, but my take on it is unless your cat is outside and at high risk, I wouldn't vaccinate. Dr. Levy may have other thoughts on that.

Yeah, I would chime in here and say there's a couple places where I do recommend vaccination and I would say I've been a more liberal user of vaccines.

From the beginning, for a couple reasons. One is, a lot of people when they get a kitten and have a plan for its lifestyle it's going to stay inside they're not going to have any other cats.

And so we didn't vaccinate those kittens and then a year later they come in with an abscess or they've given the kitten away or they got three more cats and those didn't get tested.

And since kittens are more susceptible to FeLV infection. We eventually rewrote the guidelines to say that FeLV vaccination is considered core for kittens. And then I will give them a one-year booster and then make a risk assessment so the low risk cats probably don't need to continue to get FeLV vaccines and the high-risk cats, cats that go outside, cats that live with positive cats should continue to get those vaccines.

Again, all veterinary care should be triaged for what's most important. Often clients don't have the funding to perform everything we recommend, so we need to help them prioritize and that may fall off the list, even for kitties to go outside. In the shelter environment we generally don't recommend it, there's a couple reasons, it requires several doses, and it's not effective until weeks after all of the doses have been given, and our goal is to move cats quickly through the shelter system, so they're not lingering in our care, long enough to actually get the benefit of all those vaccines. It's also pretty expensive vaccine and most shelters that are working with cats have a problem with a shortage of resources and so we want to make sure that every dollar we spend being spent really effectively.

The one exception I would make for shelters is long term shelters or sanctuaries that are intentionally keeping cats in large groups together. That is where you could have FeLV slip in through a cat that has a false negative at intake screening and then live with large numbers of cats which is more stressful and increases the risk of spreading it. So that is where I would vaccinate cats at intake against FeLV.

And that should be exceptional because we know generally most cats do better in homes or back in their neighborhoods with TNR than they would in a sanctuary setting.

So speaking of TNR, we can give you a definitive answer on the next bullet point here we should absolutely not be routine testing our community cats that are coming in for service for spay and neuter services and then going back to the field, absolutely not doing that that's been long standing, a recommendation so that is still the guideline, do not routinely test those guys as part of TNR work.

The IDEXX ELISA (SNAP) test remains the recommended point of care test.

At APA in Texas we specifically recommend you do not use other brands. No other brands, and we can talk a little bit more if you have questions on the why about that.

But we'll get into so here are based on the AAFP guidelines and all of our studies that we've done with Dr. Levy and Maddie's Fund and University of Florida, we've updated our testing guidelines in Austin this year to reflect all those changes and after many a long conversation with Dr Levy in how to do this because we have an enormous feline leukemia program we have an enormous neonate program and this was a really big deal for us to get everybody on board and change the protocols that we built. If many of you on the call have ever sent us cats feline leukemia cats, you know, we used to do serum testing and we had a whole method of doing things and it all changed this year so here's what our new guidelines are in Austin.

At the top we've got kittens, or I'm sorry cats six weeks of age and older. We test everybody at intake, because we have the resources to do so but also because we have this really robust feline leukemia program and studies on going so we do test everybody at intake using whole blood, and an IDEXX ELISA a snap test.

If the cat is positive, on that whole blood and IDEXX snap, we consider the cat is positive, we're done, no more testing. If negative we consider the cat negative, we're done, no more testing they go off to their respective adoption programs.

For nursing or pregnant queens we test at intake using whole blood and the ELISA SNAP test.

Test all cats and kittens individually, you cannot just test the mother You cannot just test the kitten you cannot just pick one kitten and test they all have to be tested individually.

If positive, the cat is positive no further testing, she's going off to the leukemia adoption program. If negative, they're negative, they're going off to regular adoption.

If results vary amongst the litter, we do separate the positives from the negatives, and that's something that you will have to suss out at your organization. I get this question a lot about do we separate the kitten from the positive mother. If they're negative and my advice is if you can guarantee to keep that kitten alive without mama you've got the neonatal team who can raise an orphan, then do separate.

If not, you have to make that risk assessment of where the kitten is going to be better off if you can't raise her as an orphan.

If the cat tests negative, but there's been known significant exposure, we will retest that cat in 30 days using the same whole blood and IDEXX test. As a little aside down there in the corner, we quit testing for FLV entirely several years ago, so we only test for feline leukemia.

So those are our simplified testing guidelines.

Here is the written protocol, and you can download that at the link on the bottom.

So no more serum testing you used to remember that, after we got that positive on the snap test we would then spin down blood and use serum in that IDEXX SNAP and we don't do that any longer.

You can see on this that at APA! we do pool blood for neonates into one test.

Big asterisk there, the AAFP nor Dr. Levy recommend that you do that, so don't do that. Don't do that if you can. We do it in Austin, as a cost saving measure because we have upwards of 3000 neonates coming in every year and we're trying to work with as little low budget as possible.

If that pooled blood comes back positive we're going to retest everyone individually, but Dr. Levy would smack me upside the head if I did not put this in there that this is not recommended and that you do this test everyone individually.

Alright, so why are we doing this, why not the serum anymore. How is this ok?

So, our research has shown us definitively that whole blood is the most sensitive and accurate testing media, the landmark study that we started four years ago in Austin was set out to prove what is the best test, then brand and medium and what is the most accurate. We did not get the answers that we thought we were going to out of that study we got a whole lot more questions and we got answers but what we did, prove definitively over and this has been shown in other studies is that whole blood is the most sensitive and accurate. So way back in the day we used to say serum is more accurate.

That is not true, whole blood is the more accurate and sensitive. And we know that IDEXX has the highest sensitivity and specificity of any point of care test on the market it's the only one will use because of that and we are not paid by IDEXX, I wish we were to say that in any regard.

So, whole blood, and then IDEXX test is your most accurate and sensitive result, period. And as far as point of care goes.

So, what did the serum do that why do we stop with the serum testing, what we think was happening was that the serum testing was weeding out the regressive cats.

But for shelter purposes we now consider regressive cats positive.

So why would we keep testing.

If regressive means positive, then we don't really need to run that serum test anymore because regressive cats are at that reduced risk of shedding, but not no risk.

They can be reactivated, and viremia can occur.

So that risk of reactivation and viremia it does decrease with time, but they can still replicate and reactivate over time, possibly lifelong. So it's safer to consider that regressive cat positive.

So if we're going to consider regressive cat positive there is no need for us to run a serum trust and try to weed him out from an abortive cat or negative cat. Regressive just means positive so positive is positive, they go to the adoption program.

So even if the cat is regressive versus progressive we're going to house them with feline leukemia positive cats.

So you are once positive on a snap test we assume that you are positive period, you're going to be living with a feline leukemia cats we understand that you may be regressive and you may test negative in the future but you're going to live with the other leukemia positive cats, a regressive cat cannot get more leukemia from living with progressive cats, so you don't have to worry about that that's a question we get like are we going to make it sick by putting it in with the really positive cats. No, it's not going to get more leukemia.

If the cat ends up abortive versus regressive, the cat likely has an adequate immune response to remain leukemia free. So, it is okay, put him in with positive cats. Still those cats are still going to be adopted out as leukemia positive cat, and our recommendation is to enter only homes as a single cat or with other positive cats. And I know we're going to get questions in the Q&A now about well can't I have my negative cat living with a positive cat if I vaccinate my negative cat? We get this all the time.

It's, I know I know many, many, many people are doing this across the country.

I am never going to personally recommend that we deliberately house positive cats with negative cats because we do know leukemia, is a potential to be a fatal virus.

So we can't in good conscience say yes go forth and integrate those, those kind of cats. We do know that you might see people are doing it. And I think that's a big difference between individuals doing that and making a decision based on your household and your cats with your private veterinarian and shelters saying that as blanket policy that it's okay to do that.

All right. Confirmation testing. I giggle now when you hear the word confirmation testing because there really is no such thing. Oftentimes there's just no such thing as confirmation testing anymore. Repeated tests, often indicate discordant results.

So you run a different test, different brand on a different media with plasma or serum, you might get a different test result, and six months from now, it might be different, and back and forth, back and forth, back and forth, this is what our big study four years ago started showing

us this like some of these cats are just nuts, changing from month to month over different fluids and it was it was insane.

So up to 25% of cats behave this way, too. So you can run all the confirmation tests that you want your oftentimes going to go down a rabbit hole and keep getting discordant results anyway, and you may never get that answer that you're spending hundreds and hundreds of dollars now trying to get. The infection changes with time and circumstance. We saw this over and over again in Austin, with our study cats, when their stress levels would spike, so would their levels of feline leukemia. And suddenly a cat who's been testing negative four months will get stressed or sick, and that they would test positive again.

So time and circumstance does affect the testing result.

The only way to determine the stage of leukemia infection is with a quantitative PCR test with which Dr. Levy is going to talk about next. I find those best suited for private practice because of the cost and because of this ongoing management or retro viruses and the fact that you may be even more confused once you get that PCR tests back. Or reserve them for unique cases where extra investigation is really warranted - I don't think we should just be blanket testing everybody with PCR much too expensive. Do you want to talk about PCR Dr. Levy?

Happy to. So PCR is a kind of test that was developed, way back in the 70s, and what it did was allow us to detect infections or other genetic problems that are present in very very low amounts undetectable amounts and it does this by detecting a few copies of DNA, and then amplifying or copying those copies over and over again until they reach a threshold that we can detect and we used to run these on gels. And nowadays pretty much everybody is using these real time PCR which is very automated. And you see a picture here on the left, that shows the samples are in a plate and its robots run these tests, and they generate these curves and, in, in a kind of a nutshell the way that the DNA is quantified is that it looks at how many cycles of amplification it takes until the sample can be detected. So if it takes a lot of cycles like more than 30 cycles before you can even detect any FeLV, that means there's not very much there to start with. On the other hand, if the signal arises really quickly after just a few cycles that means there was a lot there we amplified it and it popped up right away.

Based on our big study that Monica referred to that we've been doing for over four years now, following a group of naturally infected cats, is we can actually set a cut point between the low level and the high level that segregates these cats into what we think of as regressive long-term survivors, or if it's above that level, then we see we are calling them progressive and they are more likely to have a shorter survival.

Now that is on average. So it's important to remember that. It's not that every cat with these numbers is going to follow lockstep, we have cats that maintain very high virus levels, and they are long term survivors and then we have cats that develop a disease when they seemingly have a low amount of virus. So when you submit for this quantitative DNA which right now

IDEXX in the US is the company that it's available from internationally there's other companies as well.

They've used the data from our study to, to share with the results so when you get a result from IDEXX of quantitative FeLV PCR, it will come with this interpretation that they detected, less than a million or more than a million, and it, it provides you with prognostic information.

However, even though this is a very, very, very, very sensitive test. There are some cats that don't have enough copies of the viral DNA in their circulation to detect, so we can have negatives false negatives on PCR as well.

And this just gets into the morass of confirmatory testing there's so many caveats where it can go wrong, that you can continue to test and retest and spend money and time that you don't have an especially from the point of view of a shelter where you're talking about doing what's best for the most cats.

We can have situations where that snap test, that point of care test is positive, and you get a negative PCR tests and in that case that's what Monica referred to as discordant, you don't know for sure which test is correct.

And similarly, you can have a negative point of care test with the positive PCR tests that again is discordant, you don't know which one is correct.

If the two tests agree that does become a confirmation test if both your point of care tests, and your PCR test agree that we can say that cat most likely is truly infected, or most likely truly not infected.

Now there's some reasons why we don't just say do a combination of antigen testing and PCR testing on every single cat that certainly would give us the most information, but it's complicated for one is the PCR you have to send away and it takes you know a few days to a week to get those results back, and we don't want to do anything to slow a cat's progress through the shelter, we want to trim off every day that we can because shelters are very stressful places for cats, there is a cost to this package to that is a little pricey if you're doing a lot of cat testing. So depending on whether you have contracts for with IDEXX for different kinds of laboratory services, or a shelter discount. The package that does test for PCR and antigen in the lab will cost anywhere from \$60 to \$100, and that is before a veterinarian markup. So that's the cost to the account holder.

And as we've already been talking about the results of the cat on one day may not be the results of the cat a month later or a year later. So trying to really pin down a status on a cat beyond any kind of insecurity is practically impossible.

So for these reasons, we usually reserve PCR for managing cats lifelong in private practice, we have clients that just want to know everything about their cats perfectly fine to test those

cats, or to try and go on a deeper dive for FeLV infection in cats that have clinical disease that are associated with FeLV but are screening out negative on their first for sample, or special situations in shelter medicine. The kind of situations that come to mind for me is, for example if you test four kittens in a litter, and one is positive on the screening test.

You can just wait separate them and test them all a month or two later. Some shelters want to know faster and so they can run PCR to get some more information on those cats.

So the stage of infection doesn't change our management of the virus, we're considering these cats positive, with a one and done test.

And I think this is really a significant point to kind of pause on.

In the old days, which sometimes wasn't so long ago and sometimes are still here.

The outcome of a positive test was a terrible event. It was an automatic euthanasia for a cat. And so it became very very important to understand whether it was a true positive or a regressive infection or another status.

Because life and death decisions are being made based on that result. Now we're saying and recommending that these cats should still be adopted we adopt them with precautions, so that they're not going to live with uninfected cats, but we have a very positive and optimistic attitude about them. So the consequences of misdiagnosing a cat as positive are not as consequential as, as they were in the past.

So this has really made streamlining our processes for life saving in shelters, much more practical.

So, very simple here is our new leukemia flowchart of testing, if you remember the old days, it went 26 different ways and retest here and retest there and then what happens on serum. This is the new testing protocol at Austin Pets Alive.

If you test negative on intake using IDEXX with whole blood, you're going to standard adoption if you test positive on that same exact test on your whole blood, you're done, you're going to leukemia adoption program and that's it. We're not testing you 30 days later we're not testing you on serum we're not testing you a year later, like we used to do, you're done, you get to be adopted as leukemia cat or you get to be adopted as a negative cat.

Either way, you're going to have a live outcome and you're going to get adopted.

But that's it. We've shaved off all kinds of money and testing all kinds of time.

The exceptions in a shelter like Dr Levy was talking a little bit about known significant exposure before intake but you tested negative, we will retest you in 30 days. And those highly unusual medical cases like doc was talking about.

When to order that quantitative PCR, if you're the cat owner who want to assess that stage and there are lots of cat owners I just need to know, I want all the hints I don't care how much money I just I have to have some sort of answer it's making me nuts. Go ahead and order the quantitative PCR.

And then you're going to get this all the time, this cat is just really weird. We can't figure it out. We're all, we're all of us are going crazy in the shelter trying to figure out what in God's name is going on inside this cat, go ahead and order the PCR It might give you some clues.

But be forewarned. This is a rabbit hole, you might not get an answer back ever, you might get an answer back today and if you retest that cat next year you might get a completely different answer.

And I get these emails every day. Here's the test result here's a test result in their back and forth and someone is just this poor cat owners just desperate looking for someone to say, you definitively have this.

And that's not a thing that happens anymore in feline leukemia.

Dr. Levy explained it really, really well a long time ago to me. I now think of it like herpes virus, where it can change it changes on your immune status on how you're feeling from time to time, it can change just like the feline herpes virus.

So that's a really helpful way to kind of think about it.

All right, here's the fun uplifting part of the conversation of the webcast.

This was another study we do it we did at Austin Pets Alive! based on outcomes of feline leukemia cats and we've done oh I don't know, two or three of these studies now with Dr. Levy her team in medicine. You adopt these cats out when they pop positive with the little blue dot, adopt them out. And this is a few of the results from a study we did on adopter satisfaction for positive cats, and there were some really interesting things that prove what we had kind of thought anecdotally for years, but you can see people rated their experience living with this cat overwhelmingly as very positive - the impact of the adoption on their life was overwhelmingly very positive.

We saw high attachment rates to cats we asked the question, how was the health of the cat compared to what you were told it would be and everyone said it was about the same are actually better, better, better, the health was better than you told me it was going to be. The one on the right is the is the graph that really speaks to me, it says how likely would you be to

adopt a leukemia cat again, if you were in the same situation but you knew now what you didn't know then. Would you adopt another cat again and 73% said. Hell yeah.

And this was something we've anecdotally known in Austin for years called FeLV fever. We often think of, who would subject themselves to this, I'm going to adopt a cat that is going to die soon and then you know who would subject themselves to this, as it turns out, over three quarters of people would subject themselves to this, and they keep coming back, and we would call it FeLV fever, a cat would pass away, they come back and go up another leukemia cat, and another leukemia cat and now I want two or three at home. Um, we saw anecdotally and this proved it, people want these cats they want to feel like a hero, they want to, they want to do good that's why they're at a shelter to adopt an animal, and once someone learns that their cat who's now the love of their life would have been euthanized. Five years ago, or it many shelters still around the country, they become fierce advocates for these cats, they become donors and volunteers and they come back and adopt them again even though they've been subjected to heartbreak, and they've lost their cat earlier than they would have liked.

They would absolutely come back and adopt that cat again, also kind of interestingly this study showed us that versus negative cats are adopters of leukemia positive cats were actually more attached to their cat that higher satisfaction with the adoption process and the shelter, and they were happier with their cat on a daily basis, then people who adopted a negative cat so I think that anecdotally proves to us that feline leukemia cats are the best cats in the world, and there's just no arguing it there. It's right there in science. You can access that study at the link on the bottom of the screen if you want to see all the fun questions that we asked

I did this because to me it emphasizes that we need to stop undermining our own efforts. I see a lot of questions in the Q&A about how do we get started, nobody wants to adopt we live in rural areas, we've tried to adopt these cats out and they stay in our shelter forever. And we certainly Monica can chat with you one on one to review your FeLV adoption program and give you tips, but something global that I really liked when I visited Austin Pets Alive!, was a few things about how they feature them so if you just go to the Austin Pets Alive website and you start searching and filtering on different things.

If you click on FeLV you get these really, like, enticing nice profiles about the cats. And then if you click deeper you actually learn all about the cats and their personalities and the FeLV is kind of something to discuss later.

So it's very transparent. You know that you're talking about cats with this virus but they don't lead with that. And then in the shelter, when I was visiting they had like a concierge matchmaker program.

So you could go in and either wander around the shelter and look at hundreds of cats and get kind of overwhelmed, or you could schedule an appointment with a matchmaker and put some criteria in about what kind of cat you want it so if you wanted a lap cat that likes other cats and

gets along with dogs or would like all these criteria, the matchmaker would prescreen for you and then take you around to meet the kinds of cats that met your expectations for a good pet.

And they would lead with that and say like introduced here to Flutters one of our FeLV positive cats and the FeLV discussion would become later it's like here so with the cat meet it see what you think.

Okay, let's talk about what's going on with this cat, he's got this test this is what it means and they gave great adopter support, including follow up medical care for any conditions that were related to FeLV, and it was very much within reason like they weren't treating lymphoma and things but they would provide good comfort care and that I think is one reason why these FeLV adopters were happier than generally general adopters was they really got a concierge service, one on one, and they were not left feeling like they were going to be out in the cold. So the cost, Monica you can remind me, was something like \$40 per cat when they needed medical care, so it wasn't like it was going to break the bank to offer that protection.

Yes and only 30% of the adopted cats ever come back to us for medical care. And again, we're not treating, we're not doing chemo for lymphoma, we're providing doxycycline and metronidazole and, you know, the same standard of care that other cats get.

But that has been one of the great successes that we've made in the feline leukemia program at APA and I'm so proud of our leukemia team there on the ground. It is concierge level service we did that very deliberately when you adopt a feline leukemia cat within 24 hours you're going to get an email that says Hi my name is Kelly, I am your feline leukemia concierge at APA you need anything you have any questions you come to me. I will find you the answer because I'm the feline leukemia expert here. If I need to go ask a vet she's going to do that, but she is your point person, you're going to get an immediate response right away. They know these cats they know the adopters, you do get concierge service there and it's made a huge difference.

It's been an absolutely huge difference. we've got a sign behind our adoption counselor desk in our cattery at the shelter that says think FeLV first.

So when someone comes in and says, Hey, I'm looking for a cat that is X, Y & Z and they don't have any other cats at home. We're going to go with, let me take you to the Leukemia adoption center or show them the positive cats that are in the regular adoption center, because we do that too.

You can absolutely adopt these cats out I promise that people are looking for them.

You can filter by them on our website because so many people are looking for them.

That so you don't have to weed through 1000 cats looking for the feline leukemia positive ones. Dr. Levy was talking about our cat matchmaker program.

We actually have a self-guided course on that through Maddie's Fund. If Alison can find it on our website she'll throw the link in the chat for you, where you can take that free self-guided course to learn about our feline matchmaker program that helps get these harder to adopt cats in the homes.

Yeah, it's all about marketing it's all being transparent explaining to people what it is not scaring them taking the fear away, and then letting them be heroes and love cats.

Okay, This one's for Dr. Levy.

OK, so we've talked a little bit a few times referring to our big study. And our goal, way back over four years ago, was to solve once and for all the puzzles of FeLV testing. We thought, if we could identify a group of cats and run every single possible test on them every month for six months. At the end of that enormous effort, we would have the answer that we were all craving, because we were very dissatisfied with the uncertainty that all of us have experienced in practice, and in shelters.

So, because Austin Pets Alive has this amazing FeLV program we designed a study, it was funded by Maddie's Fund and helped subsidized by all of the different test vendors, and we enrolled 130 cats that had a fresh diagnosis of FeLV, so not animals that have been in the system a long time but incoming new, new cats. And we tested them with a very extensive panel of tests, including PCR, a couple kinds of antigen tests, IFA, and we tested serum, whole blood and plasma separately.

So we ended up with hundreds of thousands of test results. And the bottom-line answer is, we did not develop clarity about what the way to know exactly the status of a cat.

It's an unknowable, but actually what that did for me was freed up my compulsion to fight towards a definitive answer, because I know it's not available now. I know that there are a fair number of cats that are just going to defy clarity and I'm good with that now, and especially now that I compare it with a positive outcome regardless of what the result is. So what you see here on this slide is the 130 cats that we enrolled in our study.

And based on that one intake blood sample what the virus level was the pro virus with PCR, we could break them into several groups so we had a group of cats that were uninfected they were referred as infected but by the time we got them they had negative test results, so we call those uninfected or abortive infections. That's the green line on the top, and then we had another group, which had low levels of virus on the PCR tests we called that the regressive group.

And then finally the progressive group had high levels of DNA on that initial test.

And what you see here across the bottom is their follow up time This shows three years of follow up time but we're actually up to four years already.

And then the survival probability on the Y axis.

And you can see very clearly from doing that quantitative PCR on that very first sample. We make pretty good predictions about whether a cat is going to be a long-term survivor, or in a group that has a higher risk of only surviving for a few years.

So we're still following these cats were in their holiday check in right now so results are coming in most of the cats that were alive a year ago are still alive now it does seem like if they make it past that early phase that they're good to go for a long time but we plan to follow these cats for life.

So we'll let you know in 10 years maybe have some more answers for you, we definitely know both from scientific studies and from our own anecdotal experience that reducing stress seems to be really important, and giving that cat a chance to be in the regressive group, and to have longer survival. So cats that are in homes outside of the shelter and outside of sanctuaries with few other cats and low stress situation will live longer and healthier lives than cats that are kept in confinement with lots of other cats. A whole other topic we need to have is the new successful treatment for curing FIP. It's just amazing. I never thought we'd see this in our lifetime.

Hopefully it's going to get easier and cheaper to do. But one thing that was unknown is could cats with FeLV respond to this treatment and be cured. And the answer is yes they can, some of them needed a couple rounds of treatment, but we actually surprised a lot of experts that these cats can respond really well to the new drug treatment as well.

But we still recommend because we know that cats can transmit at FeLV to each other. Most, especially among kittens. But, even among adults, we do not recommend knowingly placing FeLV infected cats with uninfected cats, an abundance of caution to protect the uninfected cats, is to keep them separate. If they're already living together and I've got clients like that what I diagnose FeLV and they've got three other cats. And I tell them they should segregate those populations and they sort of smile politely say okay and they really don't do it. So I would recommend vaccinating those other cats, if you do have a mixed household.

So as I said in the very beginning. These adoption programs for positive cats are not the norm, not to name and shame but if you are still euthanizing based on that blue dot, you're the outdated rescue or shelter.

I put a picture here of cats on the bus because the bus for feline leukemia is leaving. If you don't get on it, you're going to be left behind. We're getting there and have gotten there so much quicker with feline leukemia than we did with FIV. That took years to really combat and overcome in most shelters. We are there with feline leukemia. These programs are not wacky crazy new-fangled this only happens in crazy Austin.

These are the norm now adopt these cats out you can do it. There's huge donor, volunteer and public support for these programs, people want these cats and they want them to live.

We can't take every single leukemia cat in the world, down in Austin, but we can help you set up a program.

If we do accept cats from you and Austin our transfer protocol has changed - we no longer require that serum test but we are going to make you do an IDEXX test.

We are prepared to help you start your own program we're working on a couple initiatives this year of launching a US Facebook page to list everybody's leukemia cats that are available for adoption and start marketing them and promoting them professionally, so that people, we get all the time people from states away that want to come to us with leukemia can't like no Surely there's some closer to you, we want to make that easier for people.

So, if we can answer any questions our leukemia team is there to help you. You can reach out to them at any time.

But there's our new transfer protocol too.

If you have other questions, go to that link.

And Dr. Levy and I are going to answer them but first we have a little poll that we're going to pop up.

How comfortable are you with this one and done testing protocol, as we've talked about? Pop your answer in there and then we'll see what everyone says.

Cool. Alright so 38% of people said we're already doing something like that. That's awesome.

39% I'd like to dry protocol like that for us. 7% need to learn some more 3% but I'm not comfortable with that at all and 13%, doesn't matter because we're not routinely testing anyway, so I think that's really encouraging.

I'm really proud in, and what I like is the diversity in our field, we can't make one protocol that is right for every organization, but we can try to do what's best for cats.

And at this point, we're ready for Cameron to throw some questions at us and I see we've taken up almost all of our time and that there are over 50 questions in there so Cameron had her work cut out for her to find what was some common themes, but also we will be answering any unanswered questions in the Forum over the next few days so you will be able to if we don't get to your question. Go look for it there.

We had really great questions but I think many centered around the same things. When and how should you decide that you should do a PCR test once you have that positive snap test. I think people are still really confused. And also we know that it's costly to do that. So, when should we do it and when do we not need to do it.

Well I would say for animal shelters. There's not a very frequent need to do a PCR test as Monica said, we usually do it if we want an answer really fast, such as a mixed litter, a recent exposure, we don't want to wait months to retest, or if it's just a really confusing case that the veterinarians are trying to work through, the testing has been surprising and conflicting, it's one more way that we can get some answers for that for that cat.

I think the PCR testing really has more applicability to the private practice world where veterinarians are working one on one with their clients, trying to help an individual cat.

Okay. Another question is, if we have negative cats in a litter, mom is negative, kittens are negative and one is positive, do we tell the adopters of the negative kittens that they've been exposed.

I will tell you what I do and then I'd like to hear what Monica does. I do believe in full disclosure and transparency. These are the these are those cats that like maybe we should do PCR on everybody because we're just so confused you know how did they get a mom is negative and that happens once in a while and most likely mom has a regressive infection that we can't detect, but she's passing some virus infected cells into her milk and the kittens are becoming infected, or if they're coming from the field community cats often share mothering with each other and nurse each other's kittens and so you know they might be nursing a cat you don't know about.

That's what I would do is just provide all the testing but Monica, what's your approach. Yeah, I think if we know something we should provide that information and be as transparent as humanly possible and think that's the ethical thing to do. And it's okay to say, we don't think this will impact your kitten. Science doesn't think it will happen, but this is the world of feline leukemia, it might while we don't think there's any chance of that happening, we'd like to disclose everything and be perfectly honest. So, you know, if you can keep track of that and just say in the shelter software account like there was a positive in that letter. I think if we know something we should disclose it.

And as a reminder at what age are we recommending that these kittens or cats be tested. And why not younger than that age.

Well I can, again, it's different for different organizations. My approach was I test everybody at neutering age, because they're going to get neutered at seven eight weeks and then get adopted like immediately there so that's a reasonable time to do that all at once. I also didn't use to test underage neonates/orphans and ended up missing some, some cats that then were positive at eight weeks, and that caused a lot of problems with the foster care giver.

And also, I expose infected kittens to others so my approach changed and I started testing kittens as young as one day of age, but you can miss infections, they may be infected from their mother and not testing positive yet.

And so, I also retest them at eight weeks, and you're still going to miss some.

We start testing at day old in Austin.

And do you find that the results are any different or any higher than if you just wait until they were eight weeks?

Well again we can't because our neonates can't stay at the shelter, they have to immediately go out to foster so we have to be safe and responsible and not like Dr. Levy was saying we don't want to accidentally infect and expose so. What we do know from our big studies that new needs have something entirely wacky going on with the other caveat to that we're going to hopefully do another study on some time but they are special little things.

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Another question I know we're about out of time and there's so many questions so everybody go to the Forum and we can continue this conversation, but do Monica especially for you guys do you recommend for a foster home to vaccinate their house cats, their existing cats for FeLV as some kind of protection against their fosters?

For our fosters, if you are going to foster a feline leukemia cat you need to have other feline leukemia cats, or no other cats at home, unless we know you as a foster, you've been vetted, we know you're responsible and you're going to keep that leukemia cat away from your other cats. Those are pretty exceptional, like our staff can do that, people have been fostering for us for 20 years, but we generally say that you can foster leukemia cats are no other cats and then you need to have no other cats in your home just to avoid that situation.

But we would not recommend leukemia vaccine for in another instance. Just keep the cat separate, you're not going to give leukemia under the door.

I like to make one comment I saw brought up a few times, about the brand selection that based on our work we've done in some others we do believe that the IDEXX snap test is the most accurate, the most sensitive and specific, but it is also more expensive, and it's bulky and it has to stay in the fridge. If that test doesn't work for you and you need an alternative a second best, a close second best would be a Zoetis Witness test.

It's a little card you can get them sometimes cheaper, although your IDEXX distributor might match the price if you go to them.

And it can be stored at room temperature so my opinion that the Zoetis Witness test is an acceptable second choice.

The one I would not recommend also belongs to Zoetis now and that is VetScan and their whole suite of tests is problematic in my opinion heartworm, Parvo, everything else we just have seen so many inaccurate results. So, hope that helps with that question.

We maxed out, Cameron? I think we are. we're over time. Yeah.

This happens every time Dr. Levy and I present. In pre-COVID we'd be like out in the hallway with a trail of people following us, but it makes my day I love that this many people care about feline leukemia.

But the good thing is that we can all go to the Forum and keep talking and discussing, and I think it's great to for others to share their situations and ideas as well.

Cool. Well thank you so much to everybody at Maddie's Fund, everyone at Million Cat Challenge for hosting and answering and moderating today. Thank you so much to everyone who joined, please do join us on the Forum so we can keep this going so we can help you save more cats.

I'm here to help you do that. Dr. Levy will answer questions as best she can. She's got a couple irons in the fire as usual, but we're going to make sure your questions get answered.

Help does exist if you want to start saving these cats at your organization and I will personally help you do it, I promise you that we can, things are only going to keep getting better for these cats. We're going to keep learning more and more and become more comfortable with this. The time is now to get on the bus and join the rest of us who are adopting out these amazing cats.

Thank you for watching and for all that you do to help felines in your community.

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