



***Taking the Bite Out of Rabies:
Are You at Risk in the Shelter?***
Video Transcript

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[Beginning of Audio]

Dr. Newmark: Good morning everybody. Thank you for coming. I don't know if it's your thirst for knowledge or the free breakfast that got you here this morning, but I appreciate you being here. A little bit about me first, I was in private practice for about 12 years first down in New York City then I moved up to Rochester where I've been practicing since then. And up there in Rochester I started volunteering at the local shelter going in once a week or every couple of weeks doing rabies vaccines, examining some animals. And then the light went off over my head and I saw that shelter medicine was for me and as luck would have it the shelter was going through a renovation, put in a veterinary suite, asked me to come on board, and now I've been there about 15 years or so. So I don't know if I deserve a medal or should be committed, but anyway. *[Laughter]*.

So this morning we're going to talk about rabies. I'm going to give you a little historical view of rabies through the ages. What rabies does, how it works, and then more importantly are you at risk working with animals at

the shelter. Can you contract rabies? What would happen if you do?
What's the whole story with that?

So first I want to take a little poll. How many of you do work directly with the animals? Good. Almost everyone in the room except for Elizabeth over here. *[Laughter]*. How many of you have ever been bitten or scratched by one of these animals? Okay. How many of you have had at least a fleeting thought about rabies after that's happened? *[Laughter]*.

Okay, some of you, that's good. Okay. So first off, rabies kills about 55 to 75,000 people a year worldwide no one really knows exactly how many. Part of the reason is that it's, first of all, under reported around the world especially in third world countries and even under diagnosed even here in this country, which we'll see later. So here's a quote, it's a little quiz we'll start off with, you can read it for yourselves. So who am I? Who is this talking about? Is it this guy? *[Laughter]* For you younger people my daughter said, "Dad, why don't you put a picture of one of those *Twilight* guys on it?" *[Laughter]*. I said, who? What? What are you talking about? Is it some of these people that fit the description of that quote? Or what about this cute little puppy? Oh, wait a minute. *[Laughter]*. It's rabies. It's someone with rabies. Not a vampire, not a zombie, but a rabid animal that that quote's referring to.

So rabies has been around probably forever, probably people in one way or another have been thinking about rabies since dogs started sitting around the campfire way back in early history. This is what the rabies virus looks like it's a bullet shaped virus. It's in the rhabdovirus family. The list of virus is the genus and that's all we're worry about scientifically. Even 4,000 years ago they were talking about rabies. Archeologists found in some slab somewhat wrote an inscription for a man whom a rabid dog attacks and to whom it passes its venom. I do not know what I shall do for that man. Obviously, they didn't know rabies was a virus and so forth but they knew something bad was happening when these dogs were acting crazy and would bit someone and this person would then die a horrible death.

Moving on, the ancient Greeks, Homer in *The Iliad* writes about lyssa, which is an animal state beyond anger, rage or madness. Aristotle in his book *History of Animals* he wrote that dogs suffer from three disease; gout, sore throat and rabies. I tell you, vet school would have been a lot easier if it was only three diseases I had to learn. *[Laughter]*.

Moving ahead, 10th century Baghdad a doctor wrote about a patient in the hospital there. There was with us in the hospital a man who barked during the night and died. And he did not drink water and said it stinks and the stomachs of dogs and cats are in it.

Some ancient cures for rabies actually, the Romans would take the hair off the tail of the dog that bit somebody, burn it into ashes and put the ashes on the wound and that's where the expression tail of the dog comes from actually. The Chinese, ancient Chinese would take the brain out of the rabid dog and rub it on the wound too to try and cure the person. Obviously, these things didn't work too well.

Moving ahead, in 19th century Europe that became the time where people started having dogs as pets and keep them I the house. And that was great except unfortunately led to big rabies epidemics and the late 1800's they actually would round up the dogs and kill them because they feared rabies affecting people.

So finally, in the late 1800's Louie Pasteur when he was done playing around with milk and pasteurized it he set his sights on rabies. So that's after they finally found out that the germ theory of disease, that germs carry disease and not evil spirits or whatever may be going on. So he worked with rabbits and passed the virus to rabbits and through different rabbits, generations of rabbits to weaken the rabies virus enough to use as a vaccine and first to use it on dogs. And then he actually somebody had a child who got bit by a rabid animal and they came to him and they actually used it on this nine-year old boy for the first time in 1885. And the boy

did not come down with rabies and it took off from there as far as vaccinations.

In early 1900's in Brazil all of sudden all these cows and horses were getting this paralysis in their rear legs where they'd be looking like they were sitting in a chair. Then they were having trouble swallowing, they were foaming at the mouth, and dying and then a few years later they finally isolated negri bodies from their brains, which is a way to diagnose rabies. They look for these little inclusion bodies inside some of the brain cells and so now they finally figured out these animals were dying from rabies and then a few years after that they didn't know where these animals were getting rabies from but then finally they isolated it in bats in Brazil that were the cause of rabies.

The first confirmed rabies case due to bats in the United States wasn't confirmed until Florida in 1953 when some boy was bit by a yellow bat during the day and they capture the bat and were able to isolate the negri bodies from that.

So here's another quiz, since the 1980's what animal is most frequently found to be infected with rabies? Anybody?

Audience: Raccoons.

Dr. Newmark:

Raccoons. Wow, you guys sat through this before. You're right. Our friendly friend the raccoon there. So somebody had the bright idea in the mid 1970's and before that raccoon rabies was really confined to the Southeast, northern Florida, Georgia, Alabama, way down there. And in the mid 70's someone had the bright idea oh, let's trap about 4,000 raccoons from down there and ship them up to Virginia for people to hunt.

So they did that and of course many of the raccoons escaped. And of course many of the raccoons had rabies and that's how kind of raccoon rabies took off throughout the East Coast. You can see in the map on the left that's raccoon rabies in the mid 1970's and on the map on the top right in the mid 1980's already see there's a big cluster in Pennsylvania, Virginia, Maryland, around the mid-Atlantic states. And then the map on the bottom is raccoon rabies in 2006 and it's all along the Northeast. The red areas are the most concentrated areas of rabies and we see it's all along the Northeast now because of that trapping and releasing, so to speak, from the mid '70's. And raccoons, apparently, thrive in urban and suburban areas. They're able to get in and out of garbage cans and eat whatever's around so they're just situated to live in populous areas.

Here we are in New York so where's the largest density of raccoons found? Adirondacks? Anyone think the Adirondacks? New York City? A couple of people. Catskills? Couple of people. New York City has the

largest amount of raccoons. I grew up in New York, I mean I use to see rats all the time and big cockroaches but way back in my day we didn't really have raccoons down here but now it's very common. In fact, in late 2009, early 2010 there was big raccoon rabies outbreak in Central Park.

Moving on. So how is rabies transmitted? Most of you know this, it's through infected saliva, through bites, scratches, through mucus membranes. Also through transplants, corneal transplant, organ transplants even. In 2004 there was an organ transplant they harvested organs from someone and four people received the organs and unfortunately, a few months later they all died of rabies. More recently in 2011 a person died of encephalitis they did not find the reason why this person died of encephalitis, which is a brain inflammation. And his organs were harvested, given to four people also and 17 months later, early 2013 the person who got the kidney died of rabies. The three other people did not come down with rabies. The investigators really don't know why they didn't but fortunately, they're okay. They started in with the post exposure treatment and they're doing fine.

The big program with rabies is the incubation period that's the time from when the virus gets into the body till when you start showing symptoms. The incubation period is very variable. It can be anything in animals from days to weeks and in people even months and years. Years you can have

the virus in your body just hanging out and then all of a sudden it gets up to your brain and causes problems. And the virus goes from the bite site, gets down into the nerve tracks, bypasses the bloodstream where most of your body's defenses are to fight off any kind of infection, so gets into the nerves, works its way to the spinal cord and from the spinal cord takes the direct root up to the brain. And that's when symptoms start and then the virus spills over into the salivary glands and that's how it can be passed through saliva to the next victim. If you get to the point where the virus has made it to your brain, let me put it his way, don't make plans to attend next year's conference. And investigators have found that the virus travels about one to two centimeters a day on average. So it takes a while to get up to the brain. If you're bitten on the toe it's certainly going to take a lot longer for you to develop signs of rabies than if you were bitten on the face.

What are they symptoms of rabies? Well, most of us know these. There's a couple of different phases. There's an early phase where you might see some lethargy, the animal might have a fever, not eating. Behavior reversals happen sometimes meaning if you have a dog that sits by you all the time all of a sudden it's going to be very aloof and not want anything to do with you. A cat that's just hanging on and maybe a mouser all of sudden is going to become a lap cat. Humans talk about pain at the bite site starting, flu-like symptoms, headache, insomnia, things like that. And

that lasts for a day or two and then it could progress either to the furious stage or the dumb stage. And in the furious stage we see irritability, aggression, viciousness. That's kind of like me before my morning coffee, but, *[laughing]* self-mutilation, seizures in some animals, hyper-salivation.

In people about 80 percent of people go through this furious stage. They have mood swings, hallucinations, violent behavior, hyper-salivation, and then finally some people hydrophobia, fear of water and that's kind of the kicker that's when all the lights go off over everyone's head, ah, this person has rabies when you finally get to hydrophobia, if you get to that. Or instead of the furious stage you could go into what's called the paralytic or dumb stage where you have a progressive paralysis, also hyper-salivating, inability to swallow. Only about 20 percent of people go through this dumb phase so it's much harder to make the diagnosis unless someone says oh, I got bit by a raccoon the other day or whatever. Muscle spasms, paralysis, you don't have the behavioral changes, many of these people do not show fear of water therefore, no one's thinking rabies. And the longer you wait, obviously, the less chance that you're going to survive. Usually you end up dying due to respiratory muscle paralysis and your hearts not working right either.

How is rabies diagnosed? Well, in animals we euthanize them and take a section of the brain and they do what's called direct fluorescent antibody

test where anti-rabies antibodies are mixed with these brain cells where presumably there's the rabies virus or antigen and when it mixes together it turns that green color, fluorescent is green and that's how they diagnose rabies. Or sometimes in the older days they used to use these negri bodies, if they found them inside the brain cells too.

Obviously, in people, pre-death they're not taking a section of your brain out. Most people don't have enough to spare anyway so they're looking for antibodies in the saliva or in the serum, in the spinal fluid. They also do a full thickness skin biopsy in the back of the neck and look for antibodies there. The big problem is antibodies don't come along until about a week after the virus has made it into your brain so it's a lot harder to diagnose and by that time you're just about dead.

Here are some stats that I thought at least were interesting. From the *Journal of Wildlife Diseases* if you line up a bunch of rabid animals, a fox, a cat, a horse, a whatever the fox is the most likely animal to bite you in an encounter. And a grey fox more so than a red fox. Why, I don't know and who sat there and figured this out is beyond me. Seventy percent of cattle, 80 percent of sheep go through the furious rabies stage. Less than 10 percent of rabid ferrets show aggression; so most of them are very docile and you're not even going to know or suspect rabies. Fifty-five percent of rabid cats and 31 percent of rabid dogs bite people. I thought it'd be a lot higher than that but I thought that was interesting. Some more stats, back

in 1947 about 7,000 dogs in this country were diagnosed with rabies. Fortunately, today only 70 so obviously, with vaccinating our dogs it's come a long way in preventing rabies. And in fact, the dog rabies virus variant doesn't even occur anymore in the United States all our dogs have either raccoon or skunk or bat variant rabies. Human deaths in the '30's, 250 people a year in the United States were dying of rabies. Now it averages about two per year so that's a big improvement too, fortunately.

You've seen a little bit about rabies through the years, what it does to you, how it works, how it's kind of tapered off in the years, fortunately, since the early 1900's. So, what about you now? What about working with animals in the shelter or whatever organization you're with are you at risk? Are you potentially going to come in contact with rabid animals here in New York State? Here are some stats from 2011, New York State was number five in the country in rabies, total rabies in 2011. That means domestic animals and wild animals combined. Number five in the country with 381 cases. And we were number three in the country in domestic animal rabies, dogs, cats, horses, cows, all those things. Number three in the country. And the graph shows the breakdown of all the cases. From New York State in 2011 we see there's one dog on there, seven cows, there were 38 cats, and obviously, raccoons took the lead with 162. But looking at the 38 cats, 25 of those cats that had rabies were feral, so keep

that in mind those of you who trap, neuter, and release. Nine were owned and four were stray cats.

Here's a county map of New York State. For those of you who are not geographically challenged you can find your county and see how many cases of rabies were confirmed from your county.

Audience: What's the first number?

Dr. Newmark: The first one where

Audience: Eleven out of?

Dr. Newmark: Oh, the first number is the positives out of how many samples that were sent into the lab for diagnosis. As an aside I find it interesting that Erie County sent in 863 samples thanks to Dr. Chevalier over here. Where Monroe County where I live and practice and where Rochester is we only sent in 119. Now what's interesting to me is I think every county health department takes a different view of rabies. In our county we've been told unless the animal is showing signs we think it has rabies and it bit somebody they don't want the body. So if an animal comes into our shelter, it's foaming at the mouth, it has a neon sign over its head flashing rabies, rabies, rabies, if it didn't bite anyone our health department doesn't want us to submit it. Erie County apparently is different where if you're

just walking along the street and someone says look at that baby, oh rabies, okay, let's send it in. *[Laughter]*

It's interesting to know what different health departments do throughout the state. And obviously with budget cuts and economic problems they probably don't want to take as many samples and have to process them either.

Audience: Not to blame Erie County but there were 24 positives for them.

Dr. Newmark: Right. I mean probably the more you sent in the more positives you'll have also. So in 2011, Westchester was the grand prize winner with 61 cases. Erie County was second with 24, one cat. Tompkins County where we are today had eight, no domestic animals. Monroe County where I live had five, one cat, which we'll talk about a little later. Tioga County is the one with the one dog.

So let's talk a little bit about rabies in Monroe County where Lollipop Farm is where I work and live is. In 2000 there was a visiting professor from Africa who came to SUNY Rockport. Apparently he was bit by a puppy before he left his country, came here, six months later dies of rabies. In 2003 there was a rabid fox jumped into someone's yard and attacked the five-year old girl. In 2008 in the town of Parma some

homeowners came out to the back yard and saw their two dogs wrestling with a raccoon. They were able to kill the raccoon and preserve its head so they could send the brain out for analysis. Turns out the raccoon had rabies; of course, the people's dogs were not vaccinated. So they decided to quarantine the dogs for six months and unfortunately two months into the quarantine one of the dogs started showing signs of rabies and they both had to be euthanized. Also in 2008 in the town of Churchville a woman pulled a bat out of her swimming pool that had rabies. In 2013, a woman was walking her cat one day *[laughter]* and this woman works at Lollipop, by the way, but she's in administration so that explains a lot. And she and her cat, unfortunately, were attacked by a raccoon that ran away and she had to go to the post exposure treatment.

So this is Daisy. This was my dog. She was a slightly overweight *[laughter]* 185-pound English Mastiff that we got from rescue from way back when and she was about 11-years old or so in 2007. And we live in your typical suburban housing subdivision. Our back yard backs up to other people's back yards, no wood over there or anything. And one morning I let her out to go do her thing in the back yard and she waddles outside and she's out there and all of sudden I hear her barking, and she had a loud, deep bark, barking and crying and sounds that I never really heard her make. So I go look, I open up the patio door and she's wrestling around with something on the ground way in the back yard. And so I didn't know what was going on so I screamed, "Daisy! Daisy!" So she

gets up, she runs as fast as she could I haven't seen her run that fast in years, she's arthritic, she had other health problems going on by that point, and I see something's following here. So she barely makes it INT: eh house and I try to slam the door closed and halfway in the house is a fox.

The door is holding the front half of the fox in my house and the back half out of the house. And I look at Daisy and she's all bitten up around her rear end and her hocks and her legs and there's blood coming from her. And I look at the fox and he's spitting bloody saliva on the floor and on the wall. And then my wife comes downstairs and she's like hysterical and I don't own a gun so I have my wife hold the door and I go get a broom and going to try and fix the fox out with a broom. And the fox grabs the broom and aaahhh and shaking it. And then finally we're able to push the fox back outside and slam the door. And we never caught the fox but you tell me, so the fox is running around the back yards in broad daylight, attacks a 185-pound dog and then tries to follow it inside a house, if that fox doesn't have rabies I don't know who does.

Moving along, this was Emma. This is the kitten that Monroe County had the one cat rabies case. This kitten came into our shelter was admitted as a stray in July of 2011. It was six-weeks old, one and a half pounds. It's right rear leg was mangled, there were bite wounds on it, and it's other foot had some bite wounds on it. And it looked like the bite wounds were

about four or five days old it didn't just happen that day. So we stabilized her, gave her antibiotics, fluids, etcetera, etcetera. Decided to amputate the leg, she recovered from that. A few days later we noticed that her toe on one of her other feet was really nasty looking we amputated that, she recovered from that without a problem. One of our technicians, one of our new technicians actually decided to take her into foster care. That's great so let her recover. Then she decided well, I'll just adopt her and keep her and okay, that's great. So two months go by, the technician was off that day she calls into the clinic and I'm talking to her on the phone and she says, I don't know what's going on with Emma. Yesterday she was very lethargic, she wouldn't eat, she was laying there. She actually threw up some round worms and some fluids, so I'm like rolling my eyes how did she have round worms we wormed her a million times what's going on?

And then she continues with the story, so I separated her from the other cats and the dog and I put her in her own room overnight and this morning she's ravenous. She won't stop eating. She's vocalizing. She's screaming. And then this afternoon the vocalizing is getting louder and she's carrying on and she's scratching at the door to get out and throwing herself against the door and she's acting real weird. And then I went in there to calm her down, I'm sitting with her, and she bit me on the foot, on the hand, on the thigh. So I hearkened back to when this kitten came in and I'm pretty impressed because I can't usually remember what I had for breakfast in the

morning, but I remembered what she looked like when she came in. So I said, "Kelsey, I think we have a problem here. You need to bring her in I think she might have rabies." So she hung up the phone and she was coming in with that. I said I got to go, sorry, and I left. And left the other vet there to deal with this. But no, seriously, I did have an appointment or something. So I didn't see the kitten when she came in but the other vet told me she never saw anything like this in her life. The kitten was acting like she was possessed. Never saw anything like it. They euthanized the kitten, sent the head out, and sure enough, she's positive for rabies.

Let's think about this for a second, first off, it's a little strange, I mean how does a one and half pound, six-week old kitten survive an attack from a rabid animal? That's mind-boggling to me. Secondly, what would have happened if our technician did not adopt this kitten?

We were fortunate, quote unquote, that she did that it was in her house somebody who has some knowledge about rabies and what goes on with it. Acute little kitten like this, three legs, she would have been adopted in a heartbeat from the shelter. What would have happened if this kitten was in someone's house? The people let's say have kids, you've got plenty of kids playing with the kitten day in, day out. How many people would have had to have gone for post exposure treatment? A lot probably. What kind of PR message is that sending also? Oh, come to Lollipop Farm and adopt a kitten. They come spayed or neutered, it comes vaccinated,

dewormed, leukemia tested, oh, and as an extra benefit it can have rabies too. How many people are going to come in and adopt an animal after that would hit the press? So we were very fortunate in that sense that it was in the technician's home and not adopted out. What happens if the kitten was at Lollipop waiting to be adopted? What happens if she was in a cattery with other kittens? All those kittens would have had to be euthanized.

What happens if she was in a cage by herself you have staff interacting with her, volunteers interacting with her, the public coming in and maybe looking to see if they want to adopt her and interacting with her. What about the public health nightmare that that would bring trying to find all the people that potentially interacted with her as she developed signs of rabies? Another bad thing about rabies is in dogs, cats and ferrets they could be shedding the virus a few days even before they show symptoms so you're extra screwed with that.

What should we do? What kind of policy should we adopt in these kinds of cases? I don't have the answer. In Massachusetts, for example, they have a regulation that if an animal comes into the shelter with a bite wounds of unknown origin the animal either has to be quarantined for six months or euthanized. Who has the ability the quarantine an animal for six months in their shelter? Most of us don't. Who wants to euthanize animals that come in with bite wounds? Most of us don't, certainly.

People bring in animals all the time, they have bite wounds, the admission people ask them oh, how'd this dog get this bite wound over here? So, you know, the admitters might say oh, he was fighting with the dog next door or the cat was fighting with another cat in the house, whatever. But, you know, we all know admitters sometimes don't remember the facts, not forthcoming with the facts or how can I put this gently, they lie and lie and lie when they bring in their animals. So that's one problem with that scenario of bites of origin.

How many animals come in that have bite wounds in the field that we don't even know they have a bite wound or it's just a little scratch now. Well, I don't know where that was from. I mean what are you going to do, you know, you run into this problem all the time. And rabies could take, in this little kitten's case even, two months from infection to symptoms. So what do you do with these animals? I don't have the answer. We discussed this at the shelter for a while and no one could come up with a plan to avoid this scenario again and from getting worse. We're certainly not going to start euthanizing animals because they come in with a bite wound but it can turn into a big problem like this almost did. What do you do in your shelters? Do you have any kop kind of protocol as far as what happens when an animal comes in with a bite wound? Are you quarantining for six months to make sure it doesn't come down with signs of rabies? Are you euthanizing it? Are you turning it away? I don't know.

Moving on. In the 10-year period between 2002 and 2011 there were 24 human cases of rabies in the United States. Four of them were from organ transplants, which I mentioned earlier, 13 of those people had direct contact or were bitten by an animal. But here's the kicker, seven people who came down with rabies had no obvious animal contact. They have no clue how these people got rabies. That's pretty scary when you think about that.

Some cases from 2011, a 24-year old soldier serving in Afghanistan was bitten by a dog on the hand, comes home, he's in New York. Eight months later all of sudden he's suffering from some neck tenderness and inability to swallow; it progresses to the point where he's showing full neurological symptoms, and dies of rabies. A 40-year old Massachusetts man has leg pain, inability to swallow, confusion, he has weakness, fever, his symptoms also progress to full neurological symptoms, and he dies of rabies. They analyze what kind of rabies he has and it's a subtype that's only found in dogs in Brazil. When questioning his family well, was he in Brazil recently? Actually he was in Brazil and he was in contact with a dog that might have had rabies it was acting pretty strange but it was eight years earlier. Eight years this virus was hanging out in his body and then all of a sudden it took over.

[Cell phone ringing].

We'll wait for you to answer. Do you want me to talk to them?

Another Massachusetts man, a 63-year old man develops elbow pain, inability to swallow, and then hydrophobia, dies of rabies. Turns out he woke up one morning a couple two to three months earlier and found a bat in his bedroom. No history of bite from the bat or anything the bats just hanging out in the bedroom. Two months later he dies of rabies. In fact, usually if you do find a bat in your bedroom in your house and you don't know what was going on you're supposed to get treated prophylactically for rabies anyway because apparently you could get bit by a bat and not even feel it.

An eight-year old girl in California all of sudden is having sore throats, fever, difficulty swallowing. It progresses to paralysis, convulsions, neurological symptoms. She's diagnosed with rabies turns out two months earlier she was scratched by a cat in a feral cat colony near her school. Fortunately, she survived. The reason is because of this the Milwaukee protocol. This is the treatment that's currently tried, and I emphasize tried, on people who have symptoms of rabies. It was first used in 2004 on this teenage girl who was bit on the finger by a bat that turned out to have rabies and she developed signs of rabies. And what happens is you're put into a medically induced coma with ketamine and Midazolam, which some of use to induce anesthesia in our animals also. You're given antiviral and symptomatic treatment and the theory is you're giving your

body time to develop antibodies to fight off the rabies virus. Because the thinking is rabies doesn't destroy the brain it just keeps the brain from doing what it's supposed to do so if you're in a coma and you're artificially, you know you're on a ventilator, your heart rate is stabilized, those kind of things and you survive long enough your body will fight off the rabies virus. So it's worked in six people out of 35, so 29 people it did not work. Three of the people who did survive, unfortunately, have profound neurological problems.

So once again, I'm going to emphasize if you are bit by an animal and it turns out it had rabies if you don't do anything about it, if you wait till you have signs of rabies you're probably not going to survive.

Here's where I work this is Lollipop Farm in Rochester in Monroe County and this is our intake stats from 2009, '10, '11 and '12. So in 2009 we took in about 13,000 animals. About four percent of those animals came in with some kind of rabies vaccine history. 2010, 12,500 or so about three and a half percent of those animals came in with rabies vaccines. In 2011, 12,000 animals only three percent of those came in with rabies vaccine. 2012 about 12,000 animals still about three percent came in with a history of rabies vaccine. So that means 97 percent of the animals of the dogs and cats that come into Lollipop Farm we don't know their rabies status. We don't know if they've been in contact with an animal that had rabies, if they were bit or scratched by an animal in the past that had rabies. It's a

blank slate. All those animals potentially could have rabies that we're coming in contact with and working on and with.

What about rabies shots though? Are they effective? Are they 100 percent effective? Anybody have any guess? How effective are rabies vaccines in animals? Okay then. A study in the *Journal of American Veterinary Medical Association* in 2009 show that five percent of the dogs and about two and a half percent of the cats who were confirmed with rabies were previously vaccinated. So if you're putting all your trust in the rabies vaccine that the animals have gotten it's foolish because there are still some dogs and cats that will come down with rabies even being vaccinated. No one really knows what happened. You know was the vaccine not given correctly? Was the animal immuno- compromised and couldn't mount a response to the vaccine? They're so overdue from the vaccine that their immunity is plummeted. Nobody knows. But it's pretty scary that even when you get in animals with vaccines that perhaps it's not going to be effective and protected And if the animal already has rabies in it you could vaccinate it every day and it's not going to help they're going to come down with rabies.

At Lollipop Farm we have a large animal part hence the word farm I Lollipop. We have cows, horses, goats, sheep, emus, ducks, geese, all kinds of things running around. We back up to this big wooded area.

We have a whole petting area for people to come in and hang out with the sheep and goats. We know we have foxes because unfortunately we lose a couple of geese and ducks to fox attacks every year. We know there are raccoons around in Monroe County. What about these guys they certainly could get rabies too. We vaccinate them all for rabies but is it 100 percent effective? Who knows. For the goats it's off label 'cause the vaccine's not even approved for goats. What about the people who are coming in and hanging out with these animals and petting them and the sheep and goats are slobbering all over these little kids and who knows what's going on.

Fortunately, nothing's happened but it's certainly a potential risk.

So, now let's talk about us and what happens in your organization. Does your organization have a written SOP on what happens if you are bit or scratched? Yes? No? Everybody have one in their organization?

Everyone know? Good, some people haven't shaken their heads so I don't know. Is it written or do they just go around say oh, if you get bit just do this, that and the other thing but you need to have a concrete written statement on what should be done. Even if it's written down is it followed? Are people if they are bit or scratched are they filling out the proper documentation? Is it enforced? I'm sad to say that even where I work in my clinic some of the techs and assistants when they get scratched or bit don't report it, don't say anything about it. Why? Because they don't want these animals put on a 10-day bite hold to see if they develop

signs of rabies. They don't want them potentially euthanized after the rabies hold is up assuming they don't show signs of rabies because well, now this may be an aggressive animal and shouldn't go up for adoption.

They don't fill them out. It's my job to yell at them for numerous things, including this, to make sure they are filling this thing out. To make sure that they are protected in case this animal would end up having rabies.

What about the location of the animal that did bite or scratch? Are you taken out of the general population? Is it being put in isolation or quarantined somewhere by itself or are you leaving in the cattery with the other cats or in a dog group or play group or whatever and leaving it up front for everyone to come and see and play with and touch?

And, who's doing the evaluation of the animal when it's in quarantine? Is it a vet, a tech, a staff member with knowledge or is it the bookkeeper from administration or the pizza delivery guy to the shelter? Who's watching this animal? Who's looking at it to make sure during that 10-day period it's not showing signs of rabies?

Here's some bite incidents from Lollipop Farm where I am and our local municipal shelter Rochester Animal Services over the last couple of years. So people are getting bit. This doesn't even include scratches this is just

bite wounds. Think about how many bites go on from animals in your organizations. In our place, you know we're in the teens most of the time. In 2012 we had a big increase and what happened was we got a lot of new staff in 2012 and who gets bit usually, the new staff until they learn how to handle the animals and what to do, so we had a big increase then. But it's a problem it happens a lot. So you know the bite reports are filled out, the accident reports are filled out and the animals certainly are put in quarantine and we're monitoring them to make sure they're not showing signs of rabies during that time.

We've seen that rabies is in New York State. We know raccoons carry it. We see raccoons are over the place. We see these animals are coming to shelter with unknown rabies vaccine status. We know they come in with bites and scratches, sometimes we don't even know they had bites or scratches people aren't giving us the whole information. Rabies could weeks to months in animals to show itself. Are you safe working with these animals? That's the question. And what could you do to protect yourself?

The U.S. Public Health Service their advisory committee on immunization practices recommends that anyone in the frequent rabies risk category get pre-exposure vaccinated. There's four categories. There's continuous and that's for people who work in rabies labs and with the virus. There's

frequent, which are people who work with animals in rabies endemic area, which is us. There's infrequent where people work with animals in a non-endemic area and then there's, I think, uncommon, which is just for the everyday public.

We work in the frequent risk category area. How many of you are pre-exposed vaccinated? Good, most of you. About two-thirds of you that's good. A study just came out in this recent JAVMA actually of a survey of animal workers in West Virginia, which is also endemic for rabies, 93 percent of the vets are vaccinated who work in West Virginia in animal hospitals but only 29 percent of the techs and the assistants are vaccinated. That's crazy. I know in the clinic part of the job description for our techs and our assistants are it's your job to get bit and not let the vets get bit. So if anyone should be vaccinated it should be them. You need to be vaccinated. If you work in a shelter in New York or any other endemic area you need to be pre-exposed vaccinated.

At our shelter, Lollipop Farm will pay for the vaccines after working there six months. As I said, who gets bit usually? The new workers but they still have to wait six months until Lollipop will pay for it and the vaccines are expensive so it's tough. You know economically well, should the shelter invest this money in these people who might not last six months? We've had people start, go out for lunch, and never come back even. So do you want to invest all that money and it's about 900 bucks for the pre-

exposure series. It's a hard call. At RAS in the city of Rochester they get vaccinated when they're hired. In Erie County it's a little murky. From the information I got, basically, I was told that the full-time kennel staff get vaccinated, the veterinary staff gets vaccinated, two of the wildlife volunteers get vaccinated. Apparently they have a big wildlife department there and they have about 60 wildlife volunteers and only two of them are vaccinated. It's nuts. And even with that Erie County does not pay for titer checks every two years to make sure that everyone's immunity is where it should be with rabies.

At Denver Dumb Friends League, one of the premier shelters in the country out in Colorado, gigantic budget, they don't vaccinate their staff for rabies there.

At Tompkins County here I was told, I don't know how true it is that yes, the staff is vaccinated but at least the people I spoke to one knew the procedure or when they're vaccinated. Do you know?

Audience: I know that – are you saying random like some of the staff is vaccinated the ones who have been there for a particular length of time although there's no like six-months written in stone.

Dr. Newmark:

So it's kind of hit or miss. At BARCS, which is Baltimore Animal Rescue and Care Shelter down in Baltimore, Maryland where it's also endemic, upon hiring there.

What happens in your shelters? Are you vaccinated right away?

Anybody? How long after you're working there do you get vaccinated?

Or does your shelter even pay for your vaccines? A lot of people are shaking their head no. It's crazy. Maybe administration should put their economic resources into you guys instead of coffee and donuts sometimes.

Let's talk about the pre-exposure vaccines for a moment. Basically it's a series of three intramuscular injections and at least in 2011 in Monroe County it cost \$825.00 for the series of three. And after that kitten incident with Emma everyone went to get vaccinated in the shelter who hadn't gotten vaccinated so it cost Lollipop in one chunk about \$22,000.00 for the people who weren't vaccinated, but it had to be done or it should be done. And Lollipop doesn't go out of its way to tell people oh, you've been here six months you can go get vaccinated now they leave it for them to figure out themselves. So even with pre-exposure vaccinations you still need to go through the post exposure series but it's not as drastic.

You do not need to get the immunoglobulin injection, which I hear is extremely painful. You don't need four shots you only need two shots

post exposure if you've had the pre-exposure injections. It might help a little bit if post exposure treatment is delayed if it takes a long time for some reason to get the results back on the specimen if it does have rabies. And certainly it might help prevent you from getting rabies when you don't know you've been bitten by an animal that has rabies. If there was a bat in your bedroom for some reason and it flew out again and you didn't even know it was in there, whatever the case may be. Or you had a mild scratch or a bite from an animal that went on its merry way and you never found out it had rabies.

Here's another quiz. So what happens if you are bitten by an animal that tests positive for rabies or runs off and can't be found? Well, if you do nothing about it, as I mentioned, you're going to die. Otherwise, you could go through the post exposure treatment, which you should. And the post exposure treatment ends up costing the shelter more money because now you're throwing in more vaccines, the immunoglobulin injection also. About 40,000 people in the United States are treated post exposure, if that's a word, every year. Nobody from any research I could find, nobody has ever died from rabies who's taken the post exposure vaccines so that's great. So you're going to be cured and you don't have to worry about it.

Remember, you can only develop rabies if you're bitten by an animal that has rabies while it's shedding the virus, so a couple of days before it's

showing signs in a dog, cat or ferret or during that usually week or so period when it's showing signs of rabies, all the signs we spoke about earlier. So if you're bitten by an animal and a month later it develops rabies you don't have to worry about that. That's why you have the 10-day bite hold to give it that week to see and an extra few days to make sure it doesn't show signs of rabies in that time meaning it was not shedding the virus in its saliva at that point.

If you go on the New York State Department of Health website you can find a protocol for who's entitled to get post exposure vaccinations. What does an exposure mean and what are the different variables to see if you supposedly qualify to get post exposure vaccinated?

Back to the story about Emma, the little kitten who had rabies in our shelter. So obviously, the tech who was bitten and her boyfriend in the house certainly went for the post exposure treatment. They live in a different county, actually a neighboring county so it was done there. So our vet and the two techs who helped the vet euthanize the kitten wanted to go for the post exposure treatments. They weren't sure if they got bit or scratched. You know they all, obviously, we all have our scratches and bite wounds just from working with the animals anyway, any open wounds they didn't know if the kitten was spitting on them and saliva going around whatever so they wanted to go for the vaccine. So the health

department first said no, you don't need the vaccine. You weren't bit or scratched you can't say you were so no, you don't have to go for them. So there was a big stink made we investigated with the Erie County Health Department and some other health departments to see what was going on. The technicians called their doctors and the doctors said yes, of course you have to get the vaccine. So finally the health department acquiesced and aid okay, you can go for the vaccines.

They go for the vaccines and you know, not that the medical staff is up to date on rabies, they don't see it, they don't work with animals, you know the medical staff in the hospital but they couldn't figure out what to do for the vet and the two techs. They wanted to give them the hemoglobin injection. They wanted to give them the shots in the rear end where you're not supposed to get it you're supposed to get it in the deltoid muscle. They wanted to do all kinds of things and no one knew what to do. So fortunately the staff having some kind of knowledge was able to explain to the medical staff at the hospital what needs to be done. So it could have turned into a big nightmare.

As an aside to the story how crazy medical healthcare can be, you know sometimes after vaccine the doctor or nurse puts a band aid on the area. So apparently the nurse opened up a band aid, stuck it to her own arm and then put it on one of the workers. So the moral of the story is you need to

be informed, you need to monitor your own healthcare or whatever the case may be and don't be so trusting that everyone knows what they're doing with them. So if you have been pre exposed vaccinated you only need two rabies vaccines after that and you should be fine.

What's the bottom line in all this? The bottom line is rabies is here, rabies could easily come into your shelter, into your rescue group, into your organization, you need to be protected. If your shelter is not paying for your pre-exposure vaccines you need to keep bugging the until they do or if not you probably should pay for them yourself and to be protected.

Don't ignore bites and scratches from any animal that comes in even if it has a history of rabies vaccine you never know who they were in contact with, you never know what could be lurking and what has come out. And if you do develop rabies, signs of rabies you're probably going to die.

Here's another hard day at work at Lollipop. Notice they're all smiling with me on the surgery table, I wonder why.

[End of Audio]