Transcript: Tripawd Talk Radio
Air Date: 5/17/17

Topic:
The Impact of Amputation on Dogs and Cats.
An interview with Dr. Denis Marcellin-Little, DVM, Diplomate ACVS, VSMR and Professor of Orthopedic Surgery at North Carolina State University

Duration: 0:43:25

Transcript

TRIPAWDS: Thank you for tuning in to Tripawd Talk Radio, where we're spreading the word that it's better to hop on two legs than limp on four. Hosted by TRIPAWDS and TRIPAWDS and Wyatt Ray of the Tripawd Blogs Community at Tripawd.com **[0:00:29.6] [Indiscernible]** for canine amputees and their people.

[Background Music]

TRIPAWDS: Hello and thank you for listening. This is Tripawd Talk Radio and today is Tuesday, May 2nd, 2017. Today, we're going to talk about amputation and the impact it has on the bodies of dogs and cats. We discussed front versus rear leg amputations, the effective aids on patients and some of the advances being made in the field of pet prosthetics.

Joining us today, we are honored to have DR. MARCELLIN-LITTLE Marcellin-Little, who is an acclaimed veterinary surgeon and professor of Orthopedic Surgery at North Carolina State University. He is known worldwide for his design and use of custom orthopedic impacts in dogs and cats. And we have a lot to discuss so we're just going to go ahead and get started. Thank you for joining us, Dr.

DR. MARCELLIN-LITTLE: My pleasure. I'm happy to be here.

TRIPAWDS: Hi Doctor, this is TRIPAWDS speaking with you. Thank you so much for joining us today. I can't wait to get into this discussion.

DR. MARCELLIN-LITTLE: It's a real pleasure. I'm always thinking about amputation in one form or another and talking about it is very useful for me, very important. And I'm happy to share my experiences with you guys today.

TRIPAWDS: Well, thank you. It is so important for us to be able to talk to experts like yourself because you know as we know when somebody's cat or dog is going to lose a leg, they have a million questions. And…

DR. MARCELLIN-LITTLE: Mm-hmm, exactly.

TRIPAWDS: So we're turning to you today to help us with them. I would personally just ask you, how did you get interested in veterinary orthopedics? Is it a field that you always knew that you would pursue?

DR. MARCELLIN-LITTLE: I think so. I was very interested as a kind of teenager in Engineering, kind of building things and I was interested in companion animals. And so orthopedics is really at the crossroads between building things and you know and treating for or caring for companion animals so I think that I was kind of hesitant to be at first between Engineering and Veterinary Medicine. But after Vet School, I had the opportunity to get into Orthopedics and I think that's very fulfilling for me. It allows me to blend the creation and development of implants and helping animals with orthopedic problems. So, it fits my personality, it's great.

TRIPAWDS: Well, we're glad you decided to choose Orthopedics because you know we're all about helping animals live and have a great quality of life. And a long time ago, you know, if a dog or cat was going to lose a leg, I mean a veterinary would instantly tell the owner to put the animal down because you know, oh, animal can't live on three legs. And we knew that they can live on three legs now but now, what we're starting to understand is that they can have a better quality of life if, amputation is– it's the last resort and we can use other methods that **[0:04:10.9] [Indiscernible]** has developed.

So, you know we definitely want to talk about your work in implants and prosthetics. But first, let's talk about the basics about amputation. That's something like you said, you're always thinking about it and trying to avoid it obviously. But first, tell me what, what are the typical reasons that veterinarians will take or cuts the leg off.

DR. MARCELLIN-LITTLE: Amputation is relatively common. We don't have absolute numbers to my knowledge. It would be interesting to kind of compile the number of amputees. There are amazing statistics about amputation on the human side and they are you know, a lot of amputation being performed. On the human side, you know it's a vascular problem, maybe majority of the time and there are a few amputations that are performed for trauma reasons but they are kind of fewer and far between.

On the animal side, trauma, complex fracture, pressure injuries to the lower part of a leg generally are the results of motor vehicular accident is the seemingly the major cause of amputation. We see in dogs and cats. We see amputations also performed to address the tumors, particularly bone tumors but also soft tissue sarcoma and some other tumors that affect limbs where you kind of remove the pain caused by a tumor. This amputation doesn't seem to be making dogs that have tumors live much longer but they definitely alleviate the pain associated with the tumor and they control kind of it obviously, locally, they allow the removal of the tumor completely. You know the problem with tumors is that we got to remove them by removing a little bit of tissue around that, it's maybe sometimes about an inch of tissue in all directions

around them. So, if you have a tumor kind of in the middle of your leg it becomes difficult to remove the tumor and to save the leg.

So, we also see limbs that happen to be incomplete, partial limbs sometimes only a little bit, maybe half of the foot is missing or it's missing the portion below the wrist and practically at this state in medicine, we often will remove the remainder of the leg just because the potion that is left is too short or is not solid enough and the lower part does not really have a pad, and dogs and cats don't understand. They try to use the limb that's really not meant to be used in its current shape or condition.

And so, we'll remove limbs in patients that have developmental abnormalities, there are missing portions of their limbs or have other deformities or abnormalities of their leg. There are a few rare other situations or vascular things, the vascular problems, wounds, non-healing wounds, infected wounds. They are common in people but they are very rare in dogs and cats. Dogs and cats tend to heal quite well in many instances even big wounds can heal well but sometimes the logistics, cost, complications, associated with treating a big or large wounds lead to an amputation.

TRIPAWDS: Yeah, I– we have seen some really interesting cases where our member's dog had to lose a leg because of a snake bite or a spider bites.

DR. MARCELLIN-LITTLE: Yes, exactly. Mm-hmm.

TRIPAWDS: Yeah, very unusual.

DR. MARCELLIN-LITTLE: I did write a paper about a long time ago about a patient that had a snake bite to his ankle and then first we repair kind of the work we did **[0:08:26.7] [Indiscernible]** and then later on it became clear the ankle actually had a fungal infection. And then that leg ended up being amputated to save the dog's life from that unusual fungal disease. So those things are you know relatively unusual, there are many snake bites and spider bites that do not lead to an amputation on the bright side. But once in a while, wounds can get extremely serious and we've got a– we're losing a limb or we have to amputate the limb to save a life.

TRIPAWDS: Mm-hmm. Mm-hmm. Yes and yeah, we're **[0:09:02.5] [Indiscernible]** life gets saved. So you know, you had mentioned that sometimes they'll **[0:09:09.7] [Indiscernible]** leg if there's just not a pad on the end of the limb that's left because the animal tried to use it in the wrong way. And we've seen that where some vets will prefer to leave that leg there. And in the old days, I guess they would say, oh, the animals can use the leg anyway so I had them leave it there. But one of the big questions that we have in our community is why do some vets do things that way? Why do some vets choose to remove the entire limb and some only remove part of it even in a situation like you know, if there's a car accident like why did they choose the mid-

femur amputation versus all the way up to the hip sort of thing. And I was hoping we could get your insight on that.

DR. MARCELLIN-LITTLE: Yes. So, the main– I mean the true answer to your question is why do people do different things? And the answer is they do different things because we don't really have a standard of care that say if your dog has a problem at that level, you will amputate at this level. So, in other words, we still in a little bit of an early stage in Orthopedics or in Veterinary Medicine where people are free to do kind of what they want, which I think that was maybe you know 100 years ago on the human side. People would behave the same way, you know cannot– everybody you know, no one wants to make the wrong decision but people really don't know there is no absolute standard of care about what to do with a tumor that's affecting this part of tibia or that part of the foot.

So people end up making decisions that are maybe, they are deemed medically appropriate and also logistically appropriate. So, they will say, medically, you know, if I have a tumor to the tibia, I will need to go up maybe one joint and that leaves the knee. And then you know, if a dog has a leg that stops at the knee, it won't do much good. So we will remove it mid-femur or we will disarticulate the femur. We could go both ways, I don't know that anybody will you know get upset if you want at the idea of going mid-femur versus disarticulating the femur. Many people prefer living mid-femur because a portion of the leg remains and it tends to cover a fairly vulnerable part of the body. We know the area where you had the penis, for example if it's a male so is the male will look more normal, the rear end of the dog will look more normal. The femur is not particularly helpful. You could say maybe it has with balance or it normalizes gait a little bit but scientifically we don't really know that for a fact.

Sometimes people say, "Well, leaving that femur may present a problem, you might increase the chance of a tumor being in that bone or an infection if you really have to have a wide margin of a safety margin from what the problem was then they will disarticulate at the femur, at the top of the femur, at the femoral head. Sometimes even removing a portion of the pelvis if there is a tumor in the femur itself. Sometimes a portion of the pelvis is performed that where it is more invasive and technical but again, it can save a life. So that would be called hemipelvectomy and that is not sometimes done as part of a slightly more aggressive amputation.

So, in summary, there is no absolute standard of care so people are going to maybe make their own decision or offer their recommendation. There are reasons why we would want to leave a portion of the femur and there are reasons why we would want to remove a portion of the femur. And in the absence of these reasons maybe that's you know surgeon's preference or owner's preference, if the owner can manage to influence their surgeon.

I'll say one more thing, for injuries affecting the very lower part of a leg, maybe you know the toes we see some tumors sometimes affecting the base of the toes, the nail bed or the toes themselves. Then sometimes a patient or a surgeon will be tempted to remove the entire leg and I

think at that stage, it's often more a **[0:13:59.6] [Indiscernible]** or reason of convenience or logistics that the surgeons say, "Maybe we could do a prosthesis but I don't you know, I'm not trained to do prosthesis, I'm not comfortable maybe with guaranteeing success with the prosthesis. I don't have a prosthetist that works with me. It's going to be complicated, **[0:14:18.6] [Indiscernible]** expensive, so its success is no guarantee then therefore I can remove the leg and most dogs they're reasonably well on three legs so I'm simplifying my life and everybody else's lives and amputate that leg and we'll go from there.

So, partial amputation might not be necessary for some very distal problems below the wrist or the ankle. But the future in society, we're all busy and we don't like failures or a partial amputation up here is to be a bit daunting to some surgeons and some owners.

TRIPAWDS: You know, yes. I would totally agree with that. We have seen many members come to us where the dog or cat had a problem with just the paw and the veterinarian was recommending a full amputation and we said, you know, you might want to look into the possibility of a prosthetic because – I mean if only the paw is affected, why not try to save that whole leg? We would love to see that.

DR. MARCELLIN-LITTLE: I think similarly – I agree with you.

TRIPAWDS: Yeah. So we just tell them you may want to get a second opinion because that could mean the difference between a dog with a chronic spinal issue as they get older and a dog who doesn't have them. But we will talk about that in a bit.

Right now let's keep on this conversation about amputees. I would love to ask you what are the known differences between front leg amputees and rear leg amputees as far as their orthopedic needs and things like that go? How does the loss of a limb in either side of the body affects animals? Can we get your input on that?

DR. MARCELLIN-LITTLE: Yes, I think it all starts with understanding that the front leg carries roughly twice as much weight as – or resists twice as much weight as the back leg. So it's – you know, kind of losing your front leg is like losing two back legs in some way. So also you imagine that having a single front leg makes the head and neck become more involved in kind of creating a bit of a pendulum to try to shift weight back to the pelvic limbs and the residual front leg.

So the dog will develop some spontaneous strategies to try to shift weight back by kind of raising its neck and head and having a slightly shorter stand space during their gait where the portion of the gait where the leg is on the ground, so they will have a more altered gait with a forelimb amputation and with a pelvic limb amputation.

Shifting weight forward is very easy or easier for dogs. There is less weight that has to be accounted for when the back leg is missing and so dogs have to work less hard and are more successful at walking around on three legs and they lose the back leg and one in the front.

TRIPAWDS: So the altered gait of a front leg amputee is very obvious. I mean we saw that in our own dog and we see that our dog who we have now is that he's a rear leg amputee and we – he has an altered gait in the sense that he moves side to side and like his spine is like in S shape when he walks. To me that looks like eventually it's going to affect his quality of life if we're not careful. I mean do you see that in rear leg amputees?

DR. MARCELLIN-LITTLE: Not scientifically. I would say that's an excellent concern. I'm going to kind of step back from your question a little bit and say beyond the clear difference that walking on three legs is easier when you're missing a back leg and a front leg, there is the concern about – so that would be the present and then the future would be how well are you going to be doing a month, a year and ten years from now and I tend to not be particularly worried about the future. I tend to be more worried about what we can do to make the future safer.

In other words, I would say they are clear issues that will protect dogs from kind of future problems and they include identifying comorbidities, other problems that might be present in them very early, to kind of manage them as well as possible. So understanding what is wrong but has not been found out, hasn't been discovered yet is very important. I think that's maybe the first thing.

The second thing would be having a body that can take the excess work that an amputation brings. It is the second thing that could be done or should be done and meaning that I tell people with – and care for amputees that suddenly weight, body weight is critically important and much more important than it would be in – on the four-legged dog.

So understanding how healthy bones and joints are in the remaining three legs, understanding how important it is to be lightweight and strong and so the core strength, the abdominal and back strength and the strength of the residual limb also becomes a much bigger priority in amputees.

Then the third thing I worry about is what is the dog going to be doing to stay strong or become stronger. But also what is this dog going to be avoiding to avoid injuring himself or herself in such a way that that unique leg, whether it's a front leg or a back leg, is going to now have this daunting problem that is becoming critically important. It's challenging to do surgery on the single remaining leg whether it's a front leg or a back leg. So anything we can do to prevent injuries or understand disease early on, on that residual leg, should be done.

So I think by doing those things, screening the dog very well, and having a very strong and lightweight dog and engaging in a lot of good activities, we don't have to worry too much about the future.

TRIPAWDS: I love those recommendations. That is – thank you for that because we encourage our members to seek the input of a veterinary-certified rehab therapist. Even if they think their dog is healthy – or cat, to go out there and just get them evaluated as soon as they lose that leg so that they can find out what is going to be needed for this particular animal because as I understand it, different breeds as far as dogs go, different breeds have different gaits when they lose a leg. So a bulldog gait would be very different from a German Shepherd's gait. My understanding is that it just affects their bodies differently.

DR. MARCELLIN-LITTLE: The gait is very different. How well your body is put together is kind of a unique thing and this – maybe Shepherds that are very crouched and have a different kind of a gait and suddenly, we say, "Oh, it's an amputee and they it's much more challenging for them to move around," then obviously, we all know that like **[Indiscernible] [0:22:53]** move around very well and are very agile. But Bulldogs or Shepherds have their challenges built in from how their body is put together. And the consequences on that are not scientifically known but they had to be discussed kind of in an individual basis.

TRIPAWDS: Yeah.

DR. MARCELLIN-LITTLE: Let's be optimistic that in the future, also, I'm going to add, we should have maybe like a checklist of things that should be evaluated in an amputee, what disease to worry about in specific breeds that need to be particularly, the dogs need to be screened for, maybe general guidelines on how to improve strength or minimize body weight, what type of activities might be good for amputees. All these things and information could be provided and shared and developed first then shared to help amputees as much as possible.

TRIPAWDS: I love that idea. If every vet – if pet parent could leave the vet clinic with a checklist of things to consider for their particular animal when they leave the office with one left leg, that would be great, to have these guidelines for people because a lot of people leave the vet clinic and they have no idea.

DR. MARCELLIN-LITTLE: No, of course.

TRIPAWDS: A lot of the veterinarians, they'll say, "Oh, go ahead and just let your dog do what he did before or your cat." And they come to us because there's an injury a year later and it's tragic. It's tragic. I wish everybody left knowing this kind of information. Thank you for sharing it with us.

And while we are on the subject between differences of different types of amputees, what about young versus older amputees, is it better to lose the leg when an animal is young or older? And what kind of challenges do you see for both types of age groups whether it's a cat or a dog?

DR. MARCELLIN-LITTLE: I think it's better to lose a leg not too early and not too late. I'm particularly worried about young puppies losing a leg because the excess weight carried by the other three legs tend to lead to problems in these legs whether if they have any joint problems, it's going to greatly accelerate the progression of joint disease. Something like elbow dysplasia or hip dysplasia will be accelerated so they will have much more pain in their residual limb. But also, it will lead to stretching tissues during walk, maybe even deforming their limb, their bones because the loads placed on these bones are going to be very asymmetric.

You mentioned you have a dog missing a back leg and the remaining back leg, if you lose a major leg that you use, so it's kind of in the middle of the body rather than outside of the body. And if that happens, when the dog is growing, that will impair the shape of their tibia, the shape of their femur, so they will have deformities. Having a deformity to the bones often can lead to having a problem to the adjacent joints.

The shoulders for example in young amputees become very loose. They have – the shoulder is held together by a lot of muscles and these muscles are not quite strong enough in young puppies to hold the shoulder together. So we see a lot of shoulder problems, a lot of deformities of the femur and tibia, maybe knee, instability of the knees and other consequence of having undergone an amputation too early in his life.

If you're very old and you lose a leg, sometimes because you already have the core mobility, maybe you're not particularly fit or you are overweight, sometimes you can't just get up at all and it becomes very heroic to try to rescue you. So to be kind of a young adult in pretty good shape and losing a leg, again, I don't wish it on any dog. But it has to happen, losing your leg kind of the middle of life that gives the opportunity to be healthy. And dogs tend to adapt better. We have to continue to stay strong or become stronger and lose weight and dogs can move around reasonably well. So that's better that way.

TRIPAWDS: And what about cats? Does it matter for cats when they lose a leg?

DR. MARCELLIN-LITTLE: Same idea. If you see young infancy, they will have also growth. The growth of bones in dogs and cats is very dependent the loads and the use of these limbs. So we see the similar issues in cats except we have a little bit – they tend not to grow as much obviously. The average cat is a lot smaller than the average dog. And we tend to have slightly lower expectations with regard to their mobility because as long as you they can get into the litter box and find out food and water and find a nice place to move around and play a little bit, we generally tend to have slightly lower expectations on mobility in cats than dogs.

TRIPAWDS: That makes sense. It's interesting that you mentioned about how a leg will become deformed. If an animal loses it too early, the remaining leg will become deformed. Because recently, I thought a dog who is missing a front leg and I have seen her for many years. She lost her leg as a puppy and I saw her now and the dog is about 10 years old, and she has done very well that her front leg is bowed outward. So it's very curve and it looks like she struggles more than the average amputee whose leg isn't as straight as her. So I imagined that there is some pain with that too.

DR. MARCELLIN-LITTLE: Yeah. And there is stretch in joints or these joints are at risk of additional injuries. So yeah, all these things are dangerous situations that can get worse very rapidly.

TRIPAWDS: Yes. And that's where your expertise in artificial limb comes in. So now, let's talk about that and I would love to hear what – how did you get interesting in developing? I think you called them transdermal implant. How did you – when did you start doing that? I understand it was quite a while ago.

DR. MARCELLIN-LITTLE: Yeah. I'm interesting in all kinds of prosthesis whether they are those prostheses that you wrap the residual portion or a limb. But also, the surgical prostheses, I got interested in surgical prosthesis because I had seen a patient, Marvin Olmstead, operated back in the early 2000 so 15, 17 years ago. And I thought that surgery was interesting about maybe not quite as developed as it should be.

And so around 2004, 2005, we had the opportunity to – I had the opportunity to treat a patient that was missing both – a cat that was missing both of his back legs. And we started to develop implants. At that time we had our first metal 3D printer. So our plan was to develop 3D implants. And over time, we kind of increased the sophistication of these implants that are kind of customized to the patient and 3D printed.

And it's not ready for primetime. It's still in a very investigative procedure that's long and long planning and complex rehearsals and high cost. And not a lot is known about the long-term of these implants that are actually attached to the bone. The bone grows into them. And then the skin grows into them ideally. And they stick out at the bottom of the leg.

Clearly, they can be quite successful. I have several patients that have had them for years including a cat that has now has them for about 11 years that's doing quite well. And so, they are – we know as the proof of concept they can work. It's kind of our job to make them more safe and easier and maybe cheaper so we can continue to expand on the idea and make that idea successful in the future.

TRIPAWDS: It's fascinating to see. You had me look at a video of the 11-year-old cat and I was stunned. The cat's gait is beautiful it moves around like any other four legged cat, seems

very happy. And I'm thrilled because – do you see this as the future for animals and humans eventually? I mean how far ahead into the future can you see this being a routine surgery for animals so that they can have a normal gait?

DR. MARCELLIN-LITTLE: I think it's the future indeed. We tend to look at what we're doing now – what we're doing now is so much more sophisticated than what we were doing 30 or 40 years ago. So I think a generation from now, that will become much more routine. It takes a lot of little incremental progress to have a better ingrowth of tissues into the implant and have them become more resistant to infection. I think that's the key. Have that production become a little simpler and faster but with advances in codings and implant fabrication. I think we can achieve that in the next five to ten years.

TRIPAWDS: Wow! I can't wait. I cannot wait because it's so exciting. And I know my own dog could have benefited from that. So I would just – I would love to talk about what is the most critical thing that a pet parent should know before amputation surgery? I mean can they inquire about the implant? Should they inquire about them? Are there other surgeons doing them? I mean what should they know before the animal goes into surgery so they can make sure? Go ahead.

DR. MARCELLIN-LITTLE: I think people should read. Yeah. Sorry, I'm cutting you off. I think people should have access to information and I think that information should be very neutral and objective. Sometimes it's hard to find information – the information has to come from somebody who are some entities that doesn't have a lot to gain one way or another.

So I think it's a matter of having access to that information, seeing where things are, understanding just – here, we've talked about surgical implants. We've talked a little bit about conventional prosthesis for patients who lose only a small portion of their legs. And then we talked about having amputation at multiple levels. I think it's kind of needed to have a bit of an overview of amputation options. And everybody should have access to that information. Print it. Bring it to their vets. Bring it to their vet ahead of time if they don't know it or making sure that every vet receives it. And we can only hope for the best from that point on.

TRIPAWDS: Yeah. I know it's a lot of reading for people at a time when it's very, very stressful. But in the end, it does pay off. And if they can prevent their animals to losing an entire leg and having the possibility of a prosthetic, I mean that would be fantastic.

DR. MARCELLIN-LITTLE: Exactly.

TRIPAWDS: I hope that more veterinarians out there are looking towards the kind of work that you're doing so that they can look at all the options as well. Because I have seen where a lot of vets just – they've always done without really seeing the great responsibility they are having.

DR. MARCELLIN-LITTLE: That can progress them to be slow.

TRIPAWDS: It's too bad because I see what you're doing and I would love for it to become routine. I want to address a quick question that one of our members has. And she would like to know your opinion on aside from doing core strengthening exercises and rehabilitation therapy, is there anything else that they can do to maintain the health of the remaining legs?

You had talked about weight loss and activities. Can you give a little more specific on what types of activities we don't see a three legged animal do, dog or cat?

DR. MARCELLIN-LITTLE: I think it's important – it's an excellent question because the advice tends to vary. We don't have great list of exercise. We understand generally speaking how to make your core stronger and how to make your limb stronger. You got to use them. You got to use them safely.

In other words, you can't overuse them. You shouldn't be doing things that are extremely intensive or rapid or stressful. So you do an exercise that takes place maybe on a better surface, a safe surface that's not too slippery, at a reasonable speed so you don't have to do heroic things, jumping enormous heights and so on.

You would have to look at a specific exercise and say, "This exercise works these types of muscle. It's an all-around exercise. All the muscles work." And then you would say, "Well, it's good. It exercises all the muscles."

If you are trying to strengthen a specific portion of a leg, you could look for an exercise where extension of a specific joint or flexion of another joint is the desired activity and then you would say, "Well, I want to promote extension of the hips." So then we are going to walk uphill. Or, "I want to promote flexion of the elbow." And then we are going to be clearing an obstacle that's 5 inches off the ground.

So, specific exercise can be done to achieve specific movement. With regards to the fear of injury, you would have to look at the dog. We go back to what we were talking about earlier, specific breeds, the specific gaits, specific joint motion, some dogs are very square, very upright, and dogs are more crouched when they are longer.

And so, we would also look at the shape of these legs. Some legs are very bowed naturally. That's the way the dog grew. And so, if the wrist is already pointing toward the outside, the inside of that wrist, the medial aspect of that wrist is already working hard when the dog is walking. So we will have to take that into account when we design activities. We will say, "Well, we don't want a lot of impact on joint that's already kind of leaning to the side because impact will primarily stretch the inside of that leg.

So if your leg is very straight and your body is very square then you can pretty much do every exercise you want because exercise then does not really put particular stress on the portion of a leg. So there is both an exercise-based decision making that goes with what exercise due to limb but also, a dog-specific decision making that goes into doing this exercise so that we know that these particular exercises are not going to put a portion of limb at risk.

And that's why it's good to talk or work with somebody who has experience in exercising dogs and palpitated limbs. So the exercise cannot only be adaptive to the other three legs but also to the specific shape and form of the patient.

TRIPAWDS: I love that. Thank you. Yeah, absolutely. I mean if you aren't sure what kind of exercise is appropriate, always, always consult with a certified rehabilitation therapist. And the Tripawds Foundation even has a grant to help people pay for the first cost for their first visit. We will pay up to $200.

DR. MARCELLIN-LITTLE: Yeah, that's wonderful.

TRIPAWDS: Yeah. We love that. We really want people to get educated and help their animal be healthy and strong.

One final question from this member, she wants to know what your thoughts are about supplements. Do you have any opinions about them?

DR. MARCELLIN-LITTLE: I always want to keep an open mind with everything. And I also on the flipside want to know what the science and logic behind everything we do. And in the case of supplements, they are not particularly useful in the scheme of an amputee moving around. They might have tiny little bits as far as decreasing the inflammation that's already present in the joint. That's abnormal in the legs remained.

In the big scheme of having pain-free mobility and staying strong and mobile, supplements are really not a big piece of that puzzle. They are not going to be where the emphasis should be placed. It's going to be critically important. Losing a pound is a lot more important than eating glucosamine for three months for example. It's going to have a much more profound impact on the dog.

So we have things that are above supplements on our priority list. Some supplements are more effective and others at alleviating joint pain. As a go-to modality in all amputees, supplements don't make a lot of sense.

TRIPAWDS: Thank you for clarifying that. And I couldn't agree more. Losing weight, keeping it off, let's shoot for that instead of vitamins and supplements that may now work.

DR. MARCELLIN-LITTLE: Yeah. Exactly.

TRIPAWDS: Yes. Well, I cannot thank you enough. We had spent so much time with you today and it has been really, really valuable. So we appreciate it. Thank you and we will be posting our interview on our blog and just – we keep sharing all of the wonderful works that you're doing. Thank you so much for being here today.

DR. MARCELLIN-LITTLE: I enjoyed it very much. I hope to be back. It was great. And I thank you and your organization for all the good work you're doing.

TRIPAWDS: Yes. Thank you very much for your time today, doctor. And thank you for the work that you're doing. Listeners can learn more about that at CVM.NCSU.edu. And find all past Tripawd Talk Radio Podcast and many more helpful resources at Tripawds.com.

Until next time on Tripawd Talk Radio. Learn more about canine amputation recovery and find the best gear for canine and dogs at Tripawds.com.

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