



SoundBites Podcast Transcript

Episode: Dr. Peter Scheifele of FETCHLABS

Dave Fabry: Welcome to Starkey Sound Bites. I'm your host, Dave Fabry, Starkey's Chief Innovation Officer. Our guest is someone I've been excited to chat with for this podcast for some time, not just because he's a friend of mine, but because he's spent time researching hearing loss in Man's best friend. Dr. Pete Scheifele has his Ph.D. in animal science and bioacoustics speech and hearing science. And he's a professor at the University of Cincinnati. He's the executive director of FETCHLAB, which is an internationally renowned animal hearing and bioacoustics laboratory. Dr. Pete Scheifele, welcome to the podcast.

Pete Scheifele: Nice to be here. I'm happy that you invited me.

Dave Fabry: Well, of course, but I wish we were sitting face to face, but we'll have to handle this in the manner that we're doing so this way, where you're in Cincinnati and I'm here in Minnesota. But let's start from the beginning really. Briefly, what is animal audiology?

Pete Scheifele: Animal audiology is actually something that I dreamed up when I began working at the University of Cincinnati as a professor. Of course, we are all required to do research and everybody has their own individual desires. And my primary department is in audiology at the University of Cincinnati, but also then I work with the medical school and neurology and such. And so having had an animal background, not only with my degree in animal sciences, but also with the Navy, I decided that I would really like to expand audiology into the veterinary community. And my thought was pretty simple. It was, if an audiologist can work side by side with an ENT, then why can they not work side by side with a veterinarian? And since audiologists now with our Au.D.s have the expert knowledge of audiology, it should be able to be applied to an array of animals.

The canine area came first because in the United States today, there are 80 breeds of dogs that suffer congenital deafness. And that started out pretty much with dalmatians. I think when 101 Dalmatians came out, they were very popular. And unfortunately over time with the breeding, congenital deafness is showing up as one of the primary impacts to that particular breed. So that at this day in time, one out of every five dalmatians will be born congenitally deaf. And so now the breeders of all the different breeds are gathering together with the veterinary community, and I think Dr. George Strain at Louisiana State University is kind of the starter of all this, to try to do audiological testing for congenital deafness, what audiologists would call an ABR, or what we call a BAER test, to find out if puppies are deaf so that a non-deaf purebred puppy could be registered with the American Kennel Club. And so that's kind of what started the FETCHLAB.



- Dave Fabry: Sorry. So are you saying that AKC, the American Kennel Club, if one of those puppies, unfortunately, like a dalmatian, happens to have profound hearing loss, they won't register them with AKC as a purebred.
- Pete Scheifele: Yes. They're not considered to be, they're considered to be altered, which is a kind of a bad word to use. But yeah, the dog needs to be wholesome and complete in its health, and so that's kind of the way things are looked at. So the Orthopedic Foundation for Animals turns out to be the keepers of all of the congenital testing that's done on any puppy from 35 weeks old to about 12 weeks old. And so that is where the archives are for all the testing. So when we test puppies, the owner or breeder is responsible to, if they want the puppies to be registered, they're responsible to send the BAER test results to OFA, which archives them and then they go on from there.
- As a result of that, the Army research office approached me, being some ex-military operations guy, and said, we're having some issues with our dogs. One of the issues that came up right away was that handlers we're finding out that if they were on a long helicopter ride to a landing zone, everybody in the helicopter is wearing hearing protection except the dog.
- Dave Fabry: Except the dog. Yeah.
- Pete Scheifele: And handlers have tried over the years, various different things. Most of the dogs we use are Belgian Malinois and so, it's a shepherd-like dog, they'll try bringing the ear flap down or putting cotton into dog's ears or whatever like that. But the dogs seem to be coming out of the chopper a little bit confused and not taking verbal commands. And so I wound up showing by testing a number of dogs in the helicopter that the dog was not selectively ignoring the handler. The dog could not hear the handler because it had a significant threshold shift after a 30 minute or longer ride in the helicopter with no hearing protection. As a result of that, and because of my past military, I kind of got drawn back into it again. And so we became responsible for multipurpose canines and doing hearing protection and developing hearing protection and actually working with and training the veterinarians of the Army to conduct BAER tests. So I said, well if we're going to-
- Dave Fabry: Well, that background is just, it's fascinating to think about that. And how this pathway led you to, that. You talked briefly about your experience in the military, your animal science background, which we share. I started as an animal science undergrad.
- Pete Scheifele: Really?
- Dave Fabry: Yep. Back in college. I was first in my family to go to college. And when I came off to the University of Minnesota as a freshman, I was an animal science major and only found my way through audiology, to audiology, rather, through a lab



that W. Dixon Ward and David Nelson shared where we were working on damage risk criteria for noise exposure. And as you know, a lot of what we know about hearing really dates back to Georg von Békésy's work, where he won the Nobel Prize in hearing. And a lot of that work was based on animal models and a lot of the work that Dix Ward and many others around the world have done, and I got to participate in, is based on chinchillas or Guinea pigs.

And so, so much of what we know about human hearing is based on work that was based on animal research. And so, it is one of the reasons I just love the path that you've taken, because it is really based on... People just think, oh, that's a cute hobby, but you think about the depth of this research and the area that you focused on to not only help some of these service animals — and we'll talk more about that more in a moment — but really that has helped humanity in terms of our knowledge about noise exposure in humans and about signal processing and things that are found in modern hearing aids has been based in many ways on animal research from the past.

So what I'd love for you to do is spend a minute and talk about your hearing journey. And you highlighted a few things, but when did you first get interested in audiology? A chicken and egg thing, I guess you got interested in audiology first then were in the military, working on canines, but before canines other animals. And then in establishing the FETCHLAB, kind of found your way back through this. But talk a little bit about what your initial interest was in hearing.

Pete Scheifele: Well, initially, I was attending the University of Connecticut to get my Ph.D. I was in the animal sciences department, so we're brothers in arms there. And it turns out that, like all Ph.D. candidates, I needed to come up with a thesis and something I was interested in. And I had always been interested in canine hearing. So I found myself one day over in the Communication Sciences and Disorders department roaming through the hallway. And I ran into this fellow, Frank Musiek. And I began to talk to him and said, I'm kind of interested in animal hearing and audiology. And so he countered back with, well, what do you want to do? I'm not an animal scientist. But he said, what is your interest? And at that time, my interest was, and this is what I did my Ph.D. dissertation on, was the Lombard response in beluga whales.

Dave Fabry: Crazy.

Pete Scheifele: Yeah. And I did that because I happened-

Dave Fabry: Can you talk, for those who might be uninitiated, can you give a high level explanation, everyone knows a beluga whale, but can you give a high level explanation of what the Lombard effect is?

Pete Scheifele: Sure. So the Lombard effect sometimes known to people as the cocktail party effect is a reflex that we have where upon, if you are speaking and the noise



floor that you are, environment that you're you're in, raises up, your voice will automatically raise up to meet that noise floor for intelligibility purposes. And this happens to be a reflex that we have. And it turns out that only a few animals had been known at that time to have a Lombard reflex. Some tamarins and other types of monkeys and whatever. But because of the work that I was doing in the Navy, I was very much into working with marine mammals at the time. And the bulk of the work that I was doing was up in the Saint Lawrence River estuary, where all of the shipping comes into the Saint Lawrence river to head up to the Great Lakes.

And so I was working with the Canadian government and the whale center up there called The Group for Education of Marine Mammals. And so I told this to Frank, and I said, well, I don't know anything about, I don't even know what a Lombard response is. And so he said, well, you need to find out. And so we started to work together and fashioned out my dissertation thesis that ultimately showed that yes, beluga whales in the wild do have a Lombard response. And so that went back to the military and the military responded by coming back and saying, well, you need to come do some stuff for us. So it turns out that I actually retired with 22 year in the military in 1992.

Dave Fabry: Thank you for your service. Yeah.

Pete Scheifele: Oh, you're welcome. And then I got a visit in 2014 from a fellow from the Naval Investigative Service, who said, we are reinstating your clearance, and we need you to come back and do some work for us. So, welcome back. So that's when I started to actually do work with canines because the Army research office approached me. And so it has gone on since then to not only the Army, but working dogs. FETCHLAB. I'm also responsible for testing Cincinnati SWAT dogs, dogs that are exposed to either gunfire or explosives or whatever, high noise regimes.

But we also do a lot of work with exotic animals at zoos. My wife's degree is in exotic animal training and zoo management. And so we use those together to do things such as we do a lot of sound work to protect the animals at places like Georgia Aquarium, the Mystic Aquarium, the New Port aquarium. And so that's how things started, went on. Frank got me into the whole thing and that made me then make my Ph.D. go partially animal science and partially speech and hearing sciences. So here I am with all of this in the background.

Dave Fabry: It's amazing. I mean, Frank's influence has been so profound on this field, and I didn't realize that he had also served as a mentor to you. But it doesn't surprise me, given his knowledge base and his array and breadth of interest.

So when you talk about, I think it's fascinating when you talked about how in the military, when they're bringing some of the dogs along with the teams in the helicopter, that everyone was wearing hearing protection, except the dogs. And



then what other approaches... So you identified that the dogs were suffering from at least a temporary shift in their hearing from the ride in this noisy helicopter. And we know from advising people, if they're in noisy environments that just stuffing toilet paper in their ears doesn't work. So what did you do to try to protect those working dogs from acquiring a temporary or permanent threshold shift so that when they hit the ground, they could hit the ground running and ready to start doing what they're trained to do?

Pete Scheifele: Well, the Army research office took that in hand and they put out a small business innovation research grant thing out for proposals and a company by the name of ??? and ??? both won that. But the SBIR went to both of those companies with the stipulation that I was a consultant on it because of the audiological aspects. From that, we actually developed a hearing protection device, a tactical hearing protection device for those dogs, for the special operations dogs. And now anybody can get that if they go onto Rec Specs, they can get one. But they were originally designed for military dogs that are undergoing transportation, either by vehicle, fixed wing or rotary wing aircraft. And so that went a long way towards now getting rid of the problem that the handlers had, where dogs would come off the chopper and be confused. Not taking verbal commands, that kind of things like that. So we were able to do a good thing with the development of this canine hearing protection device.

It has now spilled over into other things. Lately, one of the things that they have me working on is another thing that I kind of brought up to them when it comes down to threshold shifts. And that is that in many bases, these dogs are kenneled, and there are quite a few dogs in the kennel. Kennels over the years, and to this present day, are built to be clean, not to be acoustically correct. And so what you're looking at are dogs that are in a concrete kennel with a concrete floor and concrete walls and so on and so forth-

Dave Fabry: On hard surfaces that are reflective in many cases.

Pete Scheifele: Yeah. And so many times, I mean, the noise levels go up and down during the day, but typically during the day proper, and especially at feeding time, those noise levels in those kennels can be as high as 110 DBA. And so-

Dave Fabry: Which is a damaging level for humans and for animals.

Pete Scheifele: Absolutely. Absolutely.

Dave Fabry: When they're in a sustained exposure. And as you say, when the dogs know they're going to be getting fed, they're going to start barking. So those levels, I'm surprised they're not even louder.

Pete Scheifele: Yep. I mean, when I go and do a kennel noise mitigation, which is now what they have me working on, because now everybody's concerned that I brought



up the fact that if you are starting off your day as a handler taking your dog out of a kennel that he's been in for 24 hours and the noise levels have been very high, then that dog is already starting at a deficit with a threshold shift. Now, if you take him out and start putting him on the gun range or whatever, you are adding to that. And again, for those of us in audiology, this is pretty common stuff. You get this, but this is not the kind of thing that the average person, and certainly not the military, even think about. So now the latest, like I say, the latest thing that they have me working on is mitigating kennel noise and kind of rewriting the design for military kennels that will allow the dogs to be more calm because they're not subjected to the noise. They're not having a threshold shift at the beginning of the day, and so on and so forth.

And you would know this very well, anybody that does audiology knows this very well. I think in large part of this, when it comes down, even to humans, audiology and worrying about your hearing doesn't appear at the top of the pile. It certainly doesn't appear at the level of heart disease and things like that.

Dave Fabry: It's taken for granted until it's lost.

Pete Scheifele: It is. And and I see this a lot, even with the people that come with their puppies or people that come with their dogs that are older and say, I don't think my dog is hearing. I come home and I walk over him and he doesn't wake up. And as we know, but people don't think about, hearing loss is not like a broken bone. It's not like a cut, nothing hurts. It's nothing mechanical. And so we don't think about it. And so typically what I'll get is a person that comes in, on Fridays is when we hold our lab or clinic for puppies and people that have dogs that they think can't hear, is that this has been happening over a long period of time, just like it does with a human, but there's no pain involved in it. So people don't even know that it's happening.

And typically I'll get a person that will come in and say, I have this dog. And I think the dog can't hear, for one reason or another, it's not reacting, there's no behavioral reaction or whatever. And they'll say, it suddenly lost its hearing. And I say, no, probably it didn't suddenly lose its hearing. This has probably been going on for some time and it has been losing its hearing, but you have not noticed the symptoms, and consequently, you are now at the point where yes, your dog in fact, if we run a BAER test, find out that the dog has lost its hearing. So-

Dave Fabry: It does sound like a lot of the discussions that I have with my human patients. That it is just insidious coming on over many years. And I do want to explore that, just sorry to interrupt you, but.

Pete Scheifele: No, go ahead.



Dave Fabry: But when you talk about in the military application where the work that you've done has identified, importantly, that the dog, if they're not protecting their hearing, the same way their human counterpart is when they're on an airplane or on a Humvee, that they're not ready to go to work as soon as they get to where they're going. So you've been able to help mitigate that. Have you also helped increase or make their service life, their service years, their working years longer as a result of this? By preventing them from being exposed unnecessarily to loud sounds in transport, have you lengthened their careers, if you will, by the unwanted high noise levels?

Pete Scheifele: Absolutely. And that's one of the things that I was able to portray to the Army Research Office and some of the higher level people in the military, is that you're extending the working life of this dog so that you're not having to constantly replace dogs into the military. And so, as a result of that, I mean, that is not only good from the point of view of the health of the dog, but if you're going to be a suit, a higher level person, you're also saving money because you're not putting money into having to constantly replace the dogs that you're using.

But I think even more important than that is that we realize now that military canines, dogs that are working with police, like SWAT teams and things like that, they are really protecting the people. A military working dog that goes out with a platoon is really protecting every man and woman in that platoon.

Dave Fabry: For sure.

Pete Scheifele: So if that dog is not hearing, if the dog has a deficit, not only is the dog at a disadvantage, but it's putting every member of that platoon at a disadvantage, if it goes into a fire fight or whatever happens to happen, or a policeman. So by having these dogs have good hearing, you are not only protecting the dog, but you're protecting the people who rely on that dog for doing its job.

Dave Fabry: No question.

Pete Scheifele: So yes.

Dave Fabry: No question. And let's segue into civilian life, then. I can imagine for service dogs, for those with poor vision, seeing eye dogs, as they were historically called, or hearing dogs, being able to, again, extend the service life of those dogs. I mean, I can only imagine, I have some rough idea how much it costs to train those dogs as service dogs, and to be able to lengthen their years of service by preventing them from unnecessary exposure, as well as hunting dogs. I know they're, as well, very expensive to train and to try to prevent their hearing from unnecessary exposure. Do you do work in the civilian areas as well with these types of animals?



Pete Scheifele: Yes. And in fact, here in Cincinnati, once a year, just before Christmas, we have a veterinarian who has for years hosted what we call Canine Corp. That is a day that is set aside where a whole group of veterinarians, whether they're people that are doing dental, or osteology, or whatever, including FETCHLAB, get together and as a community service, we test all of the Cincinnati police dogs, the SWAT dogs, the search and rescue dogs, cadaver dogs. And they all get all their testing, including audiology, and they get it done for free so that we know that these dogs go back out that year and we have a baseline for them. We know that their hearing is okay. We know their health is okay. So yes. As an aside to that, though, I would say that out of every 100 dogs that I test on a Friday in the lab, roughly a third of those dogs are not puppies, but they are dogs that are being brought in by their owner either because the dog is 12 or 13 or 14 years old and has presbycusis or whatever the case may be, so-

Dave Fabry: Aging of the ear.

Pete Scheifele: Yeah. And so, yes, we are serving everybody, everybody that we can.

Dave Fabry: Going next, because I've had some dogs that have lived to be 15, 16 years. As their diets improve and we exercise them more, I always say that the best thing about the dog is they're absolutely human's best friend, but the hardest part is, is that they just don't live long enough. And we want them to have the best quality of life throughout their entire life. So, I do want to segue into that as well, to talk a little bit about, have you attempted and conducted not only assessments, but fitting canines with hearing aids?

Pete Scheifele: Yes. And before I answer that, I want to say one more thing that I think is important. In this day and age, not every veterinarian knows how to do a BAER test to test dog hearing. Moreover, many of them don't have the equipment to be able to do electrophysiological testing. And so veterinary neurologists and general veterinarians certainly could run a test. Where I think FETCHLAB comes in is that my belief is that you're a veterinarian, you practice veterinary medicine, and you should, just like an MD. You practice medicine and you should, that's your expertise.

But when it comes to expertise in audiology, we have doctors of audiology. And my belief is that we should let them do their job. If they are properly trained to work with a veterinarian, then they should do that because they understand the analysis. They understand the whys and wherefores. Which, when I went to medical school, they only give, and even here at Cincinnati, we only give one lecture on audiology. And basically, it's using a tuning fork on a person to do a basic test that you can do in an office. And then basically it's, go talk to your audiologist or your speech pathologist. And so there's no time to add the amount of audiology that needs to be done into a medical or veterinary curriculum. There just isn't a time for it. But we don't need to do that because



we have audiologists that are doctors of audiology. And so my belief is this is what needs to be done.

Now, having said that, in answer to the next topic that we're talking about. When I started doing testing here and started FETCHLAB, it turns out that I owned a dog with my wife, and this dog was doing a lot of television work. So he was on Animal Planet and things like that. But as the dog got into his 12th or 13th year, he was losing his hearing, we noticed, and he was very confounded by off-camera verbal cues and things like that. So this was the first dog that I got with my colleague, John Clark, at the University here and said, why don't we try to put a hearing aid on this dog? And so we did. We got some BTE, some behind-the-ear hearing aids, and we fashioned out a special cape for this dog to wear where the hearing aids were on the cape, Velcroed on, and the tubes went. And because this dog was highly trained, it was easy for my wife, who was the trainer and behaviorist, to work with him to accept the hearing aid.

Now, when I talk to people about hearing aids and I get people every month that are asking me, could you put hearing aids on my dogs? Can we do it? Yes, we can. The problem is, is that, well, there's a lot of problems. One of them is the cost, which we could talk about in a little while, but the other one is, is that if you're going to put a hearing aid on your dog, it requires a commitment to training that dog, because dog does not want to have something in his ear. So it takes commitment to train. And even if you train the dog to accept it, there is no guarantee that the dog will ever acknowledge the fact that that hearing aid is doing anything different for him than any other time in his life, other than having some in his ear.

It turns out with this first dog that after a month of training, we used to get home and my two kids and my wife, and I would get one of those horn on a bicycle that you get. And we'd sit in four corners of the room and then beep and see if he would acknowledge and go to the beep. Well, one night, one of my kids beeped the horn and you could see him stop and sort of recognize that, whoa, something just happened. He localized it and went to where that sound came from. So that was our test to say, well, yeah, he gets it. The hearing aid works. In the rest of his lifetime, which mounted to another year and a half or two years, he wore his cape with his hearing aids every day. And so he was the first of nine dogs to date, I have put hearing aids on.

Dave Fabry:

And so all of them, are they all wearing ones that go behind the ear. Because the additional complication that I can think of immediately is that they can move their ears and some breeds more than others. And then some that have ears that flop down over their external auditory canal. Have you tried custom devices? And I know there's challenges with that, too, because their canals are very torturous, very curvy. But have you always done the behind-the-ear style or have you tried other styles as well?



Pete Scheifele: No, we have tried other styles. And you're right, because the dog's ear canal has a vertical section and a horizontal section. We used the BTEs, the behind-the-ears at first. One of the last dogs that I put a hearing aid on was a dog that belonged to a veterinarian in Austin, Texas, and the dog was also a search and rescue dog. And so we used a wireless hearing aid, so that the power pack was on the collar. And then the hearing aid didn't need to have that tube. And as far as I know, to this date, unless the dog has passed by now, that dog again, got it, and wears the wireless hearing aids.

Now we haven't done a whole lot more with it only because of time and funding. But I am continuously asked to please, please, please develop a canine hearing aid. However, you've made hearing aid technology advanced so far, but there's a lot of things that in a hearing aid that we put on humans for them, for their daily lives that are irrelevant to the dog. The dog doesn't need heart rate and things like. And so what people...

Dave Fabry: Yet. Maybe not yet.

Pete Scheifele: Maybe not yet.

Dave Fabry: We might think of a way that that might add value, too.

Pete Scheifele: It could add veterinary value. Yes. But what I'm being constantly asked right now is, is can we start out by getting a hearing aid which is specifically made for canines that only has the technologies in it that a dog is going to need? And it might not be not now talking about police or military, because honestly, if a dog is losing its hearing to the point that it needs a hearing aid, the military and the police are not going to use that. And neither will guide dogs for the blind because it's a risk. But pet owners. Dave, I can't even begin to tell you, in the last year, I've had people from Paris, France, from Russia, from Spain, from Italy, all asking, get ahold of me via the internet and say, can you put a hearing aid on my dog?

And so we need to come up with something that is going to be useful for the dogs. And as you say, technology will be what it will, who knows what's going to happen down the line, but we don't even have a basic hearing aid that an animal could use right now to extend its life. And so the question becomes, well, what exactly does a dog need to hear? And-

Dave Fabry: Right. That's what I'd like to talk briefly about. Yeah.

Pete Scheifele: And the answer is, for the typical community of pet owners, all they want is to say, can my dog hear me call, when the dog's outside and I call him back? Can he hear the dinner dish? Can he hear household noises that the dog needs to hear to survive? And I tell these people two things, typically an email to me to put a hearing aid on a dog, usually starts out with something that says, my dog



is losing its hearing. And maybe it also has cataracts or whatever like that. And so I'd like to get a hearing aid for my dog to enhance its quality of life.

And so my response to that is two things. I tell them, first of all, the mere fact that you are contacting me to take the time and money to put a hearing aid on your dog tells me that your dog has a good quality of life. You are a good pet owner. And secondly, you have to understand that a dog's primary sense is not hearing. The dog's primary sense is olfaction, smell. And so why haven't people thought about hearing aids in the past? Because if the dog has its sense of smell, it's probably going to do just fine around your house. You start to get out into hunting and things like that and working dogs and stuff, now things change a little bit.

So the question is, can we develop a reasonably useful and not quite as expensive hearing aid specifically for canines? And so it turns out that this is a big thing. It's a big need. People want this for their dogs. And in the sense of some of the working dogs, like search and rescue and stuff, this is a kind of thing that is absolutely needed. And so that's why we have taken to be where we are and trying to say, can we pursue this? Can we actually do this?

Dave Fabry:

Yeah. I think even thinking about the signal processing differences for canines than for humans, in terms of the frequency response, the range of hearing that dogs have, at least when they start out, is a little different than for humans. But then as you said, for what the need is for most humans is to have dogs hear within that audible range for us. And to hear the types of sounds in the environment that they can pick up. Really, I mean, their ears are, like for humans, their ears are sensors. The same as their olfaction is and their vision is, and putting that all together can improve the quality of the life. And so we'll stay tuned for that. On the rehabilitative side.

I want to go back to a comment earlier that you were making about the working, maybe another career opportunity for audiologists who are interested in animal health and animal audiology is really to look at the electrophysiological measures. You mentioned the auditory brain stem response. And for those who aren't familiar with that, it's putting electrodes on and measuring brain signals in response to sounds. I presume otoacoustic emissions can be used on dogs as an objective measure, the same as they can for humans. Every baby is tested with a first level screener, is otoacoustic emissions, just with a sound that is putting a sound into the ear and then measuring an echo back from the ear.

Do you also provide additional training for those audiologists who are interested in moving into this area in certification, if you will, so that then in their area, if they wanted to work with veterinarians or with populations in the civilian population for people who want to extend their dog's quality of life and healthy hearing, do you offer that through FETCHLAB?



Pete Scheifele: Yes. I am very grateful to the University of Cincinnati in that I, as part of FETCHLAB, have created a graduate certificate in animal audiology which can only be gotten if you are a practicing licensed audiologist or an Au.D. student. And to get that certification, there are practicum hours, just like there are in the clinic for humans. They also have to attend a number of classes. And these classes, since the audiologists already know the audiology, the classes that they have to go through to get the certification are more oriented towards, okay, you're not dealing with a human, you're dealing with an animal now. And so there are some things that are veterinary that go into courses, such as how do you restrain a dog if you're going to do a test, and covering a wide variety of animals and biology to get them to understand the biological animal aspect, as opposed to a human.

And I have to say that one of the things that has come to me and I've heard my students say this over and over again, and it is something that I thought of when I opened FETCHLAB, is when I see our people in clinic, the students go into clinic and they're learning, they have a preceptor or whatever like that, and they're going to run an ABR. And so running an ABR with a human, there's so much data on humans, you sort of know what you want to expect. You go from A to Z and you what you should be getting, although peak picking is always kind of a little bit tenuous. But now all of a sudden I get my Au.D. students and they come in FETCHLAB, and now they have a dog on the table. Well, now they run an ABR or BAER test, and all bets are off. They don't know what-

Dave Fabry: They don't know what to look for.

Pete Scheifele: They don't know what the wave forms are supposed to look like. They don't know when they're supposed to happen. So they find out very quickly that if I have to go and do an ABR on an animal, first of all, I have to be really expertly know my equipment. What is my equipment line up? What is it going to do if I do something wrong? What can I expect? And then working through many, many puppy screenings and everything starting to learn, oh, this is what it looks like, because there are no universally accepted norms in the veterinary community for this. So it's an eye-opener for them. It's not like going into the clinic with the preceptor and running an... And yes, we do, typically if we're doing a puppy, we just do the ABR. Because that's what's required. If we have an older dog, we usually run a DPOAE, a distortion...

Dave Fabry: Distortion product, mm-hmm.

Pete Scheifele: Yep. The BAER test. And then sometimes we'll even run wide band remittance.

Dave Fabry: Then presumably, maybe for some of those really intelligent dogs, like mine, who's a Shih-poo, we could train him to raise his paw when he heard a sound coming through. No.



So these are all objective measures. The closest parallel for those audiologists who might be listening is probably for those who are specialized in pediatric audiologists, because you're not getting the responses back. There probably are some nonverbals you can pick up from, as you mentioned for your dog that you had, that you could tell they're attending to something. But a lot of that, I presume, is going into the training and certification for FETCHLAB. And for those again, who want, either audiologists or pet owners, who want more information on exactly what FETCHLAB is F-E-T-C-H L-A-B lab, presumably they can go to your website and find more information if they're interested, like I am in pursuing this certification. So that I can continue to pursue [00:44:00] my passion as an animal lover in addition to the audiology space.

But I mean, it's just fascinating. And I could go on all day about this topic. But I see we're running out of time. The time is flown by. But can you give me a couple tips for pet owners who might be listening, for people who might be concerned that their dog may have a hearing loss. Things to attend to, things they might notice, from your experience in those many people who are contacting you, thinking that their dog has a hearing loss, and other things that they could do in lieu of a hearing aid, which as you said, there are opportunities, but challenges for fitting dogs with hearing aids. Any tips for pet owners who suspect that their dog and their hearing isn't as acute as it once was?

Pete Scheifele:

Sure. I think that there are some symptomatic things that the average pet owner can see, but we usually don't see it because we're not attending to them. As a dog starts to lose its hearing, of course, there'll be times when you call the dog and it doesn't hear you, it doesn't come. As the hearing gets worse, they'll fall asleep and they'll not even realize you're there. We see some typical behaviors when a pet owner dog starts to lose and is losing its hearing, one of the things that the dogs will do is if they're with the family, they will lay across the doorway. And they do that because they need to know where their people are or if somebody's leaving the room. That's one of the symptoms that they'll start to do that is kind of, they're trying to accommodate what's going on.

But being observant to dog behavior, not attending what people think as selective deafness is a big thing. And symptoms like that, laying where they can, or laying next to where they're touching you so that they know when you're moving and going someplace. What I tell the guard against is people, and in the veterinary community, this was done for a long time is people will jangle keys or something like that to see if the dog can hear. And so there are two things about that.

Obviously, if you do it and you're in the same room as the dog, if the dog can see you, then all bets are off. It's not a test. Even if a dog couldn't see you, dogs tend to be very, very acutely aware of any kind of vibration. So I have people that have come to test and we tell them their dog can't hear. And then a day later they'll email me and say, well, we were watching TV and I sneezed or I



coughed and my dog responded to it. And I said, well, of course he did, but he is not responding to hearing. He's responding to the vibration that he can feel by that. So that's not a good test.

And as, and as most audiologists know, electrophysiological testing, ABR is not a true test of hearing. And you are bringing the thing up about the dog raising its paw. Well, when we test exotic animals at zoos, like polar bears and elephants and stuff, we do behavioral testing. But it's usually done like with the elephant, if the elephant stands and undergoes the test, if he can hear something, he indicates it either by a paddle or something like that, and gets a reward for that.

Now it takes an inordinate amount of time to go through all the frequencies and everything with rewards. But typically, over the years, Hefner and Hefner have done this as behavioral testing for a myriad of animals. And in fact, the first guy to put hearing aids on a dog, and he gave it up, was a fellow that was a professor at Auburn University way back in the eighties. But I think that what happened is, well, he retired, but also I think he found that at that time, there wasn't a big call for it, and it's not easy to do. If we-

Dave Fabry: No, I would not want to be on the other end of working with a polar bear and accusing it of faking a hearing loss. I do not want to be on the other side of that.

Pete Scheifele: I don't want to take up-

Dave Fabry: I have to come in for a visit and see some of this. If, if I have that opportunity.

Pete Scheifele: I would tell you this, and I don't want to take up a lot of time, but this is a cute, quick story. When I was head trainer at Mystic Aquarium, at night, we would take an animal offline, one of the dolphins, and we would work with them. We were doing some Navy work. And so we were going to do a behavioral test. And the behavioral test was, we have underwater speakers. And so it's connected to a computer. And so we put eye cups on the animal, we send it down and then somebody presses the button and a tone goes out a hydrophone. And if the animal hears it, she comes up and depresses a paddle.

Well, Marine mammals are, and specifically dolphins, are very, very perceptive. So here's what happened the first night we did it. It worked out really well. We did probably five or six trials, everything worked well. But on the second night, when we came back, the animal had our number. And what would happen is, I'd put the eye cups on the animal and she would automatically leave and go down and not even listen, come back up and depress the paddle. Why? Because I'm going to get a free fish.

So it's like, now you have to worry about behavioral bias in the whole thing and everything like that. We were even testing the dolphin's ability to, with eye cups on, to go 90 meters away in the pool and detect a six inch polypropylene ring



and get it and bring it back. And when we started to do that, it was working fine. We even put a hydrophone on her melon, so we could hear the incoming and outgoing pulses for her echolocating. So it worked well for a while. And then all of a sudden, one night I sent her down and she went right out to the object and there was nothing coming out of the hydrophone. She was not signaling. She was not echo locating. Well, it turns out that the answer to that was we had been putting that ring target in the same place, every time. After three weeks of doing that, she knew where the target was. She didn't have to echo locate, she'd just go and get it.

So me saying, oh, well, I'm Mr. Human, and I got a handle on this. Tell my technician, okay, when I put the eye cups on her, I want you to walk around and put the object, the ring in a different part in the pool. And so lo and behold, we do that, I put the ear cuffs on and he goes running around and he puts the thing in the water. And she goes right out to it with no echolocation signal. Now it confounded us for months. And then we finally figured it out by doing some seismic work. The main pool at Mystic Aquarium in the theater is built on granite rock, which is what the whole aquarium is built on. I mean, at night I can put a hydrophone in there and hear all the trucks going down I95 next to the... So all she did was she counted his footsteps. I put the eye cups on and she goes down and she listens to him walk across to where he is going to put the thing. It's incredible, I mean, working with exotic animals-

Dave Fabry: The acoustic sense of animals and dolphins is amazing. And I mean, I love my job, but I really love your job. And I guess in wrapping up, wondered if for the audiologists or audiology students who are listening to you with this incredible career you've had, do you have any key learnings or life lessons that you could impart for people that might aspire to have similar career path or goals or anything you've learned over the years?

Pete Scheifele: Well, I have learned over the years that we don't give enough credit to a lot of sensation and a lot of things that animals know and can do. And if you stop to think about it, most of what we know about radar and sonar has all come from animals just as electrophysiological and audiological testing. Whether it's a chinchilla or whether it's a bottle nose dolphin, it doesn't make any difference. And so what I've learned to do is to sit back and listen and watch. What can the animal teach me? And I'm finding out that, you know what, I'm not, as a human, I'm not, I'm not as smart sometimes as I think I am.

And so I challenge anybody that is looking for the certificate to say, you are in the audiological profession doing a great service for mankind. And we certainly need this. And your technology and everything has come a long way. Help advance the world with animals. If you have animals that are in zoological organizations under professional care, how do you make the exhibits? How do you make it safe for them? Moreover, the work that we're doing right now with elephants in South Africa, a lot of that work has to do with protecting those



elephants from poachers and protecting the people from elephants raiding their crops because people are living longer and so they're farming. We can do an awful lot for the world to that end.

Dave Fabry: Ah. I couldn't agree more. And thank you so much for being with us here today. I'd like to close by, we've started a tradition of asking each person, maybe what's your favorite song or your favorite sound, and maybe in your case, a canine or animal-based song or a sound that is a favorite of yours from over the years, given the importance of hearing? Anything you can immediately think of?

Pete Scheifele: Yeah. I think one of the things that I have always liked listening to that comes back to me is, you haven't lived until you've heard a humpback whale on a submarine sonar. When that whale sings and it comes through, it's like nothing you've ever experienced.

Dave Fabry: And now I'm going to go out and look on YouTube and see if I can find one. I've heard them on a kayak, but not on a sonar sound. And so I'm going to go out on a search for that. And so-

Pete Scheifele: Well, if you want to do that, go to a website called Dosite, D-O-S-I-T-E, which is Discovery of Sound in the Sea. And my recordings from sonar are on there for various marine mammals. You'll get your belly full.

Dave Fabry: I'm going to take you up on that. Well, Dr. Pete Scheifele, it's been an absolute pleasure to have you chat with us today about your experience. And I know our listeners are going to enjoy this podcast or this dogcast, if there are any canines out there.

And to our listeners, thank you for listening to this episode of Starkey Sound Bites. You can learn more about Dr. Scheifele's work by Googling FETCHLAB online. That again is F-E-T-C-H L-A-B. If you enjoyed this conversation, please rate and review Starkey Sound Bites on your preferred podcast platform. You can also hit subscribe to be sure you don't miss a single episode. we'll see and hear you next time.