THE Hearing Journal
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THE HEARING JOURNAL PODCAST – NOV 2020
INTERVIEW WITH DR. KEVIN MUNRO

00:05 D' Anne Rudden: In preparing for this interview today, I watched the movie *Contagion.* It might not be the smartest idea because the film is definitely a cautionary tale of what we are facing today with COVID-19.

In the film, the virus depicted was highly contagious, transmitted easily from common respiratory droplets onto surfaces where it was widely spread on public transportation and through casual contact. It also had a very high R0 (r-not) value, which is the average number of people who catch the disease from a single person.
All of this, so far, is very consistent with what we know about COVID-19.

But here is where the similarities end. With COVID-19, most people will walk around for nearly a week without feeling any symptoms, unknowingly spreading the virus. And then, if you do finally feel sick and if you are lucky enough to get a test, then and only then are you asked to "quarantine."

By then, if you were not already sheltering in place prior to the testing, you probably spread it to a whole bunch of people. Hmmm…kinda feels like a Hollywood movie. Now, one of the key aspects of COVID-19 symptoms is the loss of taste and smell, but what about the impacts of COVID-19 on hearing?

On this month's podcast, I am thrilled to chat with Dr. Kevin Munro. Dr. Munro is an Ewing Professor of Audiology and the Director of the Manchester Centre for Audiology and Deafness at the University of Manchester in Manchester, England. He is also a principal fellow and former chairman of the British Society of Audiology and a National Institute of Health Research senior investigator AND he is the only audiologist to be awarded that distinction.

Dr. Munro is also one of the world's leading researchers studying COVID-19 and its impact on hearing.

Thank you for taking the time out of your busy schedule to sit down with me.

02:39 Dr. Kevin Munro: D'Anne, that's quite an introduction. I hope you've got the right person?

02:43 D' Anne Rudden: I'm confident that I do. It seems you are all over the place.

02:49 Dr. Kevin Munro: I'm thrilled. Thank you very much for the invite.

02:52 D' Anne Rudden: Let's jump in and get to what you have been doing recently? Can you imagine a year ago that you would be the leading researcher in COVID-19 and hearing? Talk about what your current research is looking at, and how this is going to potentially impact us all?

03:14 Dr. Kevin Munro: Yes. I couldn't have managed this one a year ago, in fact, at the start of this year when I was thinking about what's going to happen in 2020? I had no idea that it was going to be this pandemic that will touch all of our lives. I knew nothing about Coronavirus. What we found rather quickly as there are classic symptoms people report such as the temperature, dry cough, fever, and fatigue, but there's a whole range of other symptoms people started to report. Things to do with our cardiovascular system, the kidneys, a condition called "CoV2". I started to notice in our articles appearing in the newspaper, individual [inaudible]... the COVID-19 has damaged my hearing [inaudible]... I decided that it would only be worthwhile investigating it. One of the things we did oddly in here, this would run in April or May time is we carried out a systematic review. We search the

literature to find any reports about Coronavirus, SARS CoV2, the virus that is responsible for the current pandemic. Is there any association with hearing problems, or tinnitus? We carried out a fairly structured formal systematic review of the literature. It didn't take us very long because it hadn't been very much published, but it was interesting that there had been some publications. There is a whole range of Coronavirus, and none of the earliest ones like SARS, MERS--there was no report that these were associated with hearing loss. But, when we did our review in May, we discovered seven articles where the reports about the current Coronavirus, SARS CoV2 was associated with hearing loss. Seven studies are not a big number. The quality of the evidence was rather low because it was often a single case report or short paragraphs, but that picqued our interest, even more. Since we published that systematic review which I might just plug and say it's available for you to download free of charge from the *International Journal of Audiology* published on June 10. I've lost count of the number of emails from members of the public contacting me. I never had this before, at all to be honest. Some reports on changes in our hearing, reports on tinnitus, and in some cases, it was clear that it had a positive test for COVID-19, but not in every case. I was blown away by the number of people who had contacted me. Over a hundred emails, I know it was more than a hundred because it was the last time I counted, so we decided that we should look into this a bit further.

We carried out another study around June, July. We interviewed people who had been in hospital in Manchester with COVID-19. These were the people whose symptoms were sufficiently severe that they had to be hospitalized. They had been discharged from the hospital, but they all received a routine follow-up appointment after eight weeks which is part of the standard care. The appointment was conducted mainly by telephone or telemedicine remotely. As part of the many questions these individuals were asked, there is a question that slipped, "How's your hearing?" It wasn't conducted by an audiologist with a vested interest in identifying what's their hearing problem. These questions were just borrowed from amongst lots of other questions. It was 121 adults. Eight weeks after the discharge they get a telephone call to check on their progress on their breathing if they are still short of breath or if they are still had fatigue. Thirteen percent (13%) of them reported something had changed with their hearing. The statistics (if I recall correctly) were eight of these adults said their hearing wasn't good as it was before they had COVID-19. Some of them said that they had a problem with their hearing before but it got worse. Some said they had no problems but now got a problem with their hearing. The other 8 were people who were reported with tinnitus, so noises in their ears are in their heads. Of all the emails that have come to me, and I have already addressed several of [inaudible] today in this recording. Tinnitus is a recurring thing that people have been reporting.

We were blown away with more than one in ten individuals who were saying something had changed with their hearing. Again, if you don't mind a little plug; it also appeared in the International Journal of Audiology. It was on the 31st of July, and it’s available for downloads. It has caught the attention of the media. Normally, I publish things on hearing and not on the outside audiology that has very much interest, but this time around there's been a hundred and twenty news outlets who have contacted me for interviews to ask more about this. It took us by surprise--as many as 1 in 10 individuals.

What I can't say right now, but we are hoping to address this, what is responsible for all these people saying something has changed with their hearing? In every case, has the virus directly damaged their inner ear, their cochlea, or the nerve? We know viruses can cause hearing problems, such as measles, mumps, and also viral meningitis. We know the ear is susceptible to viruses. It's not unexpected these could happen. On the other hand, it might not be a direct consequence of the virus damaging the ear. It might be an indirect consequence of the way our bodies fight the virus. A normal strong immune reaction [inaudible]. There are many others [inaudible]... These are the people who had been in critical chaos who all were in hospital. [inaudible]... with hearing, a little bit cautious about... We know for example that some medications can potentially [inaudible] damage the ear. The anti-malarial drugs can cause tinnitus [inaudible]. Commonly, there are people who were taking chloroquine

thinking it might protect them, but there are several hundred clinical trials and it doesn't show evidence to support that. People were taking chloroquine, but we all know it can cause hearing problems or tinnitus. One of [inaudible] two...Remdesivir. Remdesivir is an antiviral drug that stops the virus from developing and reproducing. This class of medication can cause hearing problems, it can be possible it is not the virus but the treatment can cause problems. We also have to be careful.. for some people it's just a mere coincidence because we know throughout the year people can get tinnitus and sudden hearing loss. But I do think it's likely the use of a face mask, people are struggling with their hearing. Individuals who manage are being taken to hospitals, which have a high level of anxiety, noisy environment, everyone's wearing a face mask, they are desperate to hear every single bit of information they are given. It could be that they have a problem with their hearing.

In regards tinnitus, we know it causes a mental and emotional strain, which we all go through this year because of the pandemic, can lead to unhealthy stress. There's an association between stress and tinnitus. What we need to do is to find some way of untangling it and explain the cause of why some individuals are complaining about these problems. It brings me right up today to tell you that I've got a confirmation that we now have research funding.

We are about to conduct a study, it is a comprehensive and diagnostic study to explore hearing and auditory problems, and people who had COVID-19. We will be starting shortly in the UK. We are fortunate in Manchester, in the Manchester Centre for Audiology and Deafness, we have spoken with the mobile research unit, banned with a relatively large surgery booth with all the equipment we need. We are going to go out and test people who have been hospitalized with COVID-19, and compare them to people who are hospitalized for other health problems to see if there's something about having COVID-19 can lead to problems for people with auditory systems. It is a study we will be starting shortly, it might take a year to complete but it will be the first comprehensive study carried out. Until we do the study, we have lots of unanswered questions, and we are working to start the study as soon as we can. It will tell us in detail about the proportion of the people who had COVID-19 who had hearing problems that are persisting? It is a summary I've got right now with our COVID-19 research.

13:48 D' Anne Rudden: People like me who are in clinical practice are jumping at the bed for information because we are now starting seeing people clinically. I've seen people who have recovered from COVID-19 now, and for us to be able to distinguish what part of that was just coincidence and what part was contributed by COVID-19? It's a big deal for us out here in the field to help to educate the people in our own communities and the physicians and the people we worked with every day. Could you spend a moment to talk a little bit about the evolution of telehealth and audiology, and how it changed things due to COVID-19? I know its something you are focused on as well.

14:50 Dr. Kevin Munro: All of the world is now looking at telehealth in ways that people didn't look at previously. One of my colleagues at Manchester Centre for Audiology and Deafness, Gabby Saunders, who is known to some of your listeners and readers. He carried out a survey looking at the working practices of (I forgot the exact number) but it was about one hundred and twenty UK audiologists. She was asking them if they used telemedicine or telehealth, whatever the preferred term. is before. Have you been using it during the pandemic? Do you think you'll carry on using it? What are the pros and cons about it? At least it would be interesting how much this variance across the world, but in the UK about one in three audiologists reported some experience of telemedicine or telehealth. As a result of the pandemic that went up to… all of them, almost 100 percent said, "I have been using the telephone to carry out the cases straight." When these individuals were asked, "But in the long term, what do you think will happen? Do you think when the new normal is established, will you go back to how you did it before or not?" Most individuals, around 80 to 90 percent, said, "We are likely to carry on using telehealth in some shape or form." During the pandemic, the biggest category of individuals the audiologist contacted were adults with tinnitus. One of the categories with the use of telehealth the least was adults who had a balanced problem (vestibular problem). When Gabby asked these individuals in the survey, "What were the

reasons that you aren't using telehealth before?" and some would say, "It was just our clinical practice.. the states called we didn't have to do face-to-face work. We didn't change, we carried on.'' Some of the audiologists said, "We prefer the interactions of being face-to-face," and others said, "It is not everything that you can do remotely, you do need to see some people face-to-face." There was a lack of infrastructure, no facility, or the training to be able to do the work remotely. Some asked clients or patients what they prefer, and the report that came back to Gabby was there wasn't really much interest in telehealth but the pandemic has totally changed that.
When audiologists were asked, "If compared to doing face-to-face work, what is the difference? They are now saying, "It's convenient, flexible, people don't need to travel. We've enjoyed using it, and it doesn't seem to reduce what people think about the quality of our service."

I supposed one downside that was consistently reported was audiologists are concerned about the quality of their interactions, that there was something missing when it couldn't be face-to-face. Going forward, things have changed and have changed forever. Telehealth is here to stay and it is not just for developing countries, but we need to improve the infrastructure, the IT that is available to audiologists. Also in our university, we need to make sure their education and training so people will feel a lot more comfortable using it. Just to finish my point about telemedicine, is it's likely to be hybrid. There will always be some people who will always desire face-to-face, and there may be some procedures where it is almost impossible to do remotely, but telemedicine is here to stay.

19:14 D' Anne Rudden: I don't disagree with you, so doing those things now - there's never been a better time to jump in if you've not explored it. Dr. Munro, I can not believe how quickly this first segment went. I feel there's so much to unpack in what you had to say. I know our colleagues will enjoy the Aftershow. Stick around and come back to the Aftershow because we are going to get to know Dr. Munro a little bit better. Who is this mysterious Dr. Munro who's doing all this amazing research over in the UK? Thank you so much for being here.

20:01 Dr. Kevin Munro: You are welcome. Thank you very much.

AFTERSHOW

20:06 D' Anne Rudden: We are back on the Hearing Journal Podcast Aftershow with Dr. Kevin Munro from the Manchester Centre for Audiology and Deafness at the University of Manchester in England. For those who did not catch the first main podcast, do yourself a favor go back and listen to it because there are so many gems and so much juice on what Dr. Munro had to share with us on COVID-19. The emerging studies and things they are starting to dive into - you will not regret your time listening to some of the information. I want to give Dr. Munro an opportunity to share a little bit about who he is and to get to know you personally. We see your name, we see your studies, we see you out in the world representing audiology but not many of us get the opportunity to get to know you. I'm going to put you on the spot. Tell us one thing we may not know about you?

21:24 Dr. Kevin Munro: I'm sure there are lots of things people don't know about me. Just to mention passing, I did an audition on the BBC many years ago to appear on television programs. But, maybe there's more relevant to today's discussion is, I used to have a dog that wore a hearing aid. I did veterinary work. I had a dog, a King Charles Spaniel with congenital hearing loss that I fit the hearing aid into. He had a great life sadly he's gone now, but the hearing aid makes a difference.

It all began when I received a handwritten letter from an ENT vet. The letter arrived, believed it or not on the 1st of April. You will doubt and say, "This is an April's Fool [joke].'' I got this letter saying, "I'm an ENT vet, I worked with dog breeders, and one of them is saying they sound their puppies and the new owners will bring them back to say

their puppies are deaf. The owners are concerned and don't want to affect their livelihood or their business. Can you help me test these puppies?" To my shame, flip the letter to one side. I thought it was some April fool. A week or two later, the vet came back, and we did a lot of research together. I tested thousands of dogs, we tested lots of Dalmatians. Dalmatians are known breeds to have hearing problems, and they have big litters of 10 puppies. On average, one of the puppies will have severe or profound hearing loss in both years, and another two puppies will have a severe hearing loss in one year. Very high statistic, that is three puppies in every litter of 10. We think of Dalmatians as a big quiet dog with black marks, but they may have something related to Waardenburg Syndrome. I used the newborn hearing screening for Dalmatian puppies when they were 6 weeks old using ABR. Not too dissimilar to what we do in humans, and if there is a hearing loss it wouldn't have been used for dogs for breeding purposes.

We can have an immediate interest in these stories, and I got into televisions once or twice because security dogs used by the army and the police need to have good hearing. They are built to detect where sounds come from. At least in the UK, the army and the police didn't have a formal breeding program, so they will be taking dogs into training them. I was told the army spent about fifteen thousand pounds to train each dog. Back then, the exchange rate between the dollar and pound was better, that would have been about thirty thousand dollars. Now, it is probably about fifteen or twenty thousand. I used to test dogs that are going to be used by the army and the police, and dogs that were used for people who are deaf as their assistive dogs (hearing dogs for the deaf). I have quite a few publications from my days doing vet work that I expect not many people know about.

25:09 D' Anne Rudden: That's amazing. It is so funny that you bring that up because when I sit around, cocktail hour with my colleagues we often speculate as to where the future will take us in audiology. It has been an area that I think people have said, "What if there was such a thing people love their dogs, they love their pets, they want them to hear well?" In fact, the University of Northern Colorado, here where I live has what they call a “Fetch lab” where they worked with the animals. Maybe, that is the future, right? [Inaudible]... You can have a specialty in veterinary audiology, maybe you could live the charge with that?

25:57 Dr. Kevin Munro: Why not? We used to see dogs, working dogs, or also spaniels, have this squashed face, it's rather flat with a squashed nose. The medical name for that is brachycephalic syndrome. There are some similarities to people with Down syndrome, these dogs are prone to having middle-ear fluid. We sometimes fit in grommet ventilation tubes to drain the fluid away. It is a market out there both from the pet-owner partner who also got the serious working dogs, the military dogs for example.

26:41 D' Anne Rudden: I haven't thought about working dogs and police dogs, but that is fascinating. It can be a whole second career for me.

That leads naturally and organically into where do you see us going? Audiology in some ways, we have always professionally transitioned. In my 25 years in the profession, I have seen so much change, and it is hard to predict where we are headed or where we are going. I want to get your perspective. Do you see audiology's future as being bright or are there things that we should be concerned about as we look at the future? Where do you see us going in five, 10, or 25more years?

27:56 Dr. Kevin Munro: So you’re asking me to look into my crystal ball. When I start to work in audiology, the audiologist would spend a lot of time doing a diagnostic test to separate the sensory hearing loss from neural hearing loss. We do things from the Carhart tone decay test, and cc test, and test for abnormal loudness growth in acoustic reflex decay. Along came these sophisticated imaging techniques, and we lost a lot of the part of our job. The emphasis changed to oral rehabilitation, and back then many audiologists saw it as a threat that one is not needed, but what it meant was we could spend our time with people who needed their expertise. I think that may

happen again. When we look at hearing technology directly to consumers and over the counter devices, a lot of people see it as a threat to their livelihood. In my own view—it is like standing on a beach without a wave coming towards us and we won't be able to stop it—but the positive thing about it means audiologists will build and concentrate on spending time with people that really need their personal lives one of care. I don't know if you'll agree—but there are patients I've seen in the past who didn't need me to do some of the procedures or spend time with them. But I think the technology is going to result in some big changes. Not for the worst, it could be bumpy, and we have to work through it. In the UK, most people get their hearing aids through the National Health Service all free of charge, but they had to go to their general practitioner and get referred to an audiologist in the National Health Service. It seemed absurd to me. It makes people like my father think that you have to be ill to go to your GP to get a referral. I don't know why we are treated any different from getting glasses for looking after our eyes, going to the high streets to get it, or going to the dentist on the high streets to get it. All your fixes in the high streets. I don't see why there should be any different for our hearing. Move away from talking about deafness and start talking about healthy hearing and the benefits of looking after our hearing, and not always seeing it as a negative as a sign of getting older. We need to completely get away from the idea.

In relation to the changes in technology and devices, I wouldn't be surprised if during my career we start to see effective inner ear therapist medications people will take. The audiologist would say, "This could be a bit of an effect to me, does this mean you give someone a tablet or an injection through their eardrum and no longer need my services", it is highly unlikely. But, there might be a merging where some medications could help slow down hearing loss, or prevent hearing loss, or restore it sufficiently that someone can maximize the benefit they are going to get from the hearing aids. I don't think we are going to go from the primary intervention for permanent hearing loss to hearing aids. We don't need it at all. Everyone is going to get drugs to correct it. It might happen for a few people or a small number, but there will be a merging in the middle where there will be a combination of these things. If I am looking into my crystal ball, and it is not looking very shiny right now. There might be two areas that could change the practice for audiologists during our careers.

32:26 D' Anne Rudden: It seems to me, the fear we are going to be made obsolete can also breed invention. The transformation of what or how we saw ourselves at some point in time, and to revolutionizing how we present in moving forward and the things we could be capable of. If we only see ourselves in a very limited frame, that doesn't give much room for evolution.

33:03 Dr. Kevin Munro: That's right. Our scope of practice could extend. We have a growing and aging population and the numbers are getting higher all the time for all the people with hearing loss. We know there are clusters or comorbidities. One of the things we are talking about a lot would be hearing loss and cognitive decline, or hearing loss, and dementia. We are known for a great many years for an association between sensory [inaudible]...you have the lowest of which your cognitive ability is going to be. Is the hearing loss a result in cognitive decline? If it is, then we can prevent hearing loss. If we can provide intervention and hearing aids, then it can prevent cognitive decline. For example, there are common causes like the eyes, ears are a window into your brain, and they are a reflection of saying there is something not right in there, and you are having a cognitive decline. There might be some inflammation that causes both hearing loss and cognitive decline, or oxidative stress. An important area now is to understand the relationship, and we don't know the nature of that relationship. What I could say is providing hearing aids when they are appropriate can improve people's quality of life. If you improve someone's quality of life, it is a good thing. The diagnosis for dementia includes someone's ability to function. If someone has a hearing loss and you provide them hearing aid, it then helps them maintain an individual living, it will prevent or delay being labeled as having dementia even though the hearing aid doesn't change the brain in any way. There is always going to be a role for audiologists certainly during my lifetime.

36:20 D' Anne Rudden: We appreciate that you are always on the cutting edge in studying things that are going to

impact all of us. Your knowledge and your research, it trickles down to people like myself with a very small private practice. You are making an impact on the world and on your profession. I am grateful you spent your afternoon tea time to chat a bit with me and to share your knowledge with your colleagues. Thank you so much for coming to the program today.

36:57 Dr. Kevin Munro: That is very kind of you D'Anne. It's been a pleasure. Thank you.

37:00 END