THE KNOWLEDGE SESSIONS

Implementation science – what can veterinary medicine learn from human medicine? Podcast transcript

Lara Carim

Hello and welcome to this podcast from RCVS Knowledge. My name is Lara Carim, and today we're coming to you from the University of Oxford where the esteemed Trish Greenhalgh is Professor of Primary Care Health Sciences. We're delighted that Trish is hosting us today to lead a roundtable discussion on the subject 'Implementation Science: what can veterinary medicine learn from human medicine?'

Trish is an internationally recognised academic in primary healthcare, having previously held professorships at UCL and Queen Mary University of London. She also trained as a GP. Trish leads a programme of research at the interface between social sciences and medicine, with a strong emphasis on the organisation and delivery of health services. In addition, she is Joint Module Coordinator on the knowledge interaction module of Oxford's MSc in Evidence-based healthcare.

Trish, thank you very much for having us today. Before we get into the discussion, could I invite our roundtable guests to introduce themselves briefly touching on the nature of your interest in this area?

Zoe Belshaw

So my name is Zoe Belshaw. I am a internal medicine specialist in dogs and cats and for the last seven years I've been working in the Centre for Evidence-based Veterinary Medicine at the University of Nottingham, firstly doing a PhD, looking at how vets and owners make decisions about elderly pets and then doing postdoctoral work, looking at attitudes of vets, owners, and nurses around preventive healthcare. I'm currently combining that with working two days a week back in general clinical practice at the PDSA, which is a charity veterinary clinic based in Nottingham and doing lots of other bits and bobs on the side.

Louise Buckley

Hello, my name is Louise Buckley. I'm a veterinary nurse who's been practising for 20 years. I've lectured in veterinary nursing at a university for seven years, and I've been with the University of Edinburgh the last two years, working in postgraduate education in the area of clinical animal behaviour. I also work part time in veterinary practice as a locum.

Imogen Schofield

Hi there, I'm Imogen Schofield. I graduated as a vet six years ago and worked in primary care practice for four years. I then made a move into more of the world of academia, firstly, by doing a Master's in veterinary epidemiology, and I'm now currently a PhD student at the Royal Veterinary College. I am using primary care electronic health records to try and increase the level of evidence from the primary care perspective. I think my interest in this was after coming out from university into the world of practice and finding it a little bit overwhelming as to how to summarise the evidence that's there, and trying to get the approach from a primary care point of view.

Adewole Adekola

Hello, my name is Adewole Adekola. I am a veterinarian. I trained as a veterinarian in Nigeria from the University of Ibadan. And after graduation, I worked briefly for two years as a veterinarian before I got interested in public health and decided to go into it. I did a Master's in clinical pathology, after which I did a Master's in public health as a means of trying to combine some of my expertise as a veterinarian into practical application in human health angle as well, taking the 'one health' approach. And that formed the basis of my present PhD at the Royal Veterinary College, where I'm working on the molecular, clinical and serological epidemiology of canine leptospirosis in Nigeria, as a means of improving diagnosis and also the knowledge about it in Nigeria, both for human and animal health.

Laura Playforth

Hi, I'm Laura Playforth. I am a veterinary surgeon. I qualified 20 years ago and I currently work for Vets Now as their Professional Standards Director. My role involves clinical and professional standards and the culture within Vets Now across all our clinics and hospitals, working with our team of clinical leaders. I've been interested in quality improvement for some time and it forms a very large part of my role. I've very recently completed my Master's in advancing healthcare practice. And I also am the current Vice-Chair of RCVS Knowledge Quality Improvement Advisory Board.

Lara Carim

Thanks everyone. Shall we start then, Trish, with a definition?

Trish Greenhalgh

Yes, I suppose there isn't one single definition of implementation science, and I think that's probably good different people look on it in slightly different ways, but broadly speaking, it's the link between research evidence and the use of that evidence in practice and policy. So, for example, that includes things like, well, how can we best express evidence in a way that people will engage with it and understand it? How can we influence the behaviour of practitioners, lay people in order to use evidence optimally and appropriately? How can we support the work of groups and teams? How can team dynamics influence whether evidence is taken up appropriately and fully? How can we create the organisational environment in which new

research evidence is taken up and discussed, and rapidly implemented, and how can we support evidence-based policymaking?

So those are some of the areas in which implementation science is relevant, and depending on which of those and other ramifications of implementation you're looking at, you will have a slightly different definition of what that implementation would actually look like. Let's start with the problem, here's the problem. Now, hang on, which bits of the theoretical insights are particularly salient and relevant to this case? And I think if we have the confidence to start with the stories, start with reflecting on the stories, then we'll end up drawing on the right bits of evidence.

Imogen Schofield

I don't think I have an particular story, but I think pulling from it, I used to, well I still do find it very difficult looking at it from the veterinary primary health perspective, that a lot of our evidence is gold standard. So coming from a referral practice, and saying that if you've got a dog with a broken leg that needs a fracture repair, these are the kind of steps that you need to take and best practice for fixation, and that sort of thing. But when it comes into a primary care situation, an evidence base is situation specific, and you have issues with finances or limitations on insurance, it changes what is recommended and what you can implement in practice. And I think that's the part that I've always found very difficult; is actually taking what we know is best practice, but actually kind of applying that to most cases that we see. I think a lot of what you should be doing isn't actually feasible for a lot of cases that we are seeing.

Trish Greenhalgh

That's a really great example. And if we now continue with that narrative, the things that stop you being able to follow best practice recommendations are fundamentally resources and practicalities, logistics...What exactly would stop you?

Imogen Schofield

I think a lot of it is financial from the owner's point of view, that is a limiting factor. I think sometimes resources, so if you can't send that animal away to a specialist centre and you're keeping it within practice; it might be a personal level, so if it's kind of an emergency situation and I've only been qualified for a couple of years, I think my level of expertise would not be the same as someone 30 years' graduated or something like that, so I think sometimes it can be specific to what you've got available in practice. So I think it's always fluctuating depending on the specifics in that practice as well as a financial situation to the owner.

Trish Greenhalgh

Now this is a very interesting example, because what we seem to be having here is the counsel of perfection from your gold standard trials, whatever it might be, and then the practical reality of veterinary practice as actually practised. Now, I would say that what we've got here is an evidence base that is not fit for purpose. So rather than say, well, of course, you've got to stand on your head and make this work, which of course you can't do, we need to push back and say, we need an evidence base that is better suited to the reality that we're living in.

Now, this whole podcast is about what can veterinary medicine learn from human medicine? And one of the things that we might want to transfer over is something called the pragmatic randomised controlled trial. So you all know what a randomised controlled trial is - you randomly allocate the participants to either the intervention or the control group. And there is a school of thought that says you should do that in a very pure way to get the maximum difference between the groups. But there's also a school of thought that says, no, no, no, no. Bring the trial into the down and dirty of real-world practice. And when I say down and dirty, you know what I mean - it's all those things in our real lives and work that constrain the kind of interventions that we can actually deliver.

And so, for example, affordability would be a very big thing. There's this limited amount of money that someone's going to spend on their dog, for example and perhaps, you know, that should be taken into account and built into the trial. So what you would do in a pragmatic randomised controlled trial, is first of all, you co-design it with the practitioners and also the pet owners who might be affected by the evidence when it was generated. So you'd co-design the study and you'd say, all right, this is going to be the intervention. This is going to be the control, but the intervention would take account of the fact that there is an affordability dimension.

And so what you'd end up with at the end of that pragmatic trial is something that wasn't perfect, in the sense of you spent an unlimited amount of money, you'd have a different intervention, but the intervention would be something that spoke to the realities of clinical practice. That's all very well, but what you've actually got is a different evidence base. So we're then talking about, what do we do when the evidence base doesn't apply to me here in my practice? And the answer is we have to use common sense. There is no magic way of making that evidence base work.

And tell me what you do actually do. Let's say I had a dog that had a broken leg and I was only prepared to spend 50 quid on it. What would you do?

Imogen Schofield

Yeah, I think it is doing what is going to relieve that suffering, or what is possible in that situation. So I always provide the options that are there and give an idea of cost to that. So it might be that it's a salvage procedure, so you end up amputating the limb or something like that. And again, it would depend on, sort of, age and situation based on that pet. So it might be that we're dealing with a 13-year-old working dog and it's no benefit to the farmer any more.

So there's always a different situation, but, like you say, it is using a bit of common sense and discussing it with the owner and getting an idea of where they want to take it. So I think other situations with a complex medical case or that sort of thing, I think often it's kind of group discussions and getting multiple other vets' input and kind of trying to use this collective experience, rather than using it from that literature base, but trying to use everyone's points of view of what they've done in a similar situation.

Trish Greenhalgh

Yes. And I think I would encourage you to have confidence in what you're doing professionally, because the first thing you said when you were talking about that was, it's all about relieving

suffering or minimising suffering. In other words, you are driven, as professionals tend to be, by an ethical commitment to do the best for your patient. And of course, you've got two patients, in inverted commas: as a vet you've got the animal, and then you've got the owner. And the work I've done with vets makes me realise that there's sometimes tensions there, in the same way that we have with parents and children in medicine.

Now, the decision-making that gets done by professionals tends to be driven by what we call case-based reasoning, which is something that Aristotle introduced, goodness knows, 500 years BC: what is the best outcome I can achieve for this patient at this time, given these constraints? And the way you do that, is you deliberate around the practicalities, around the priorities, around your very strong professional instincts.

And one of the things that gets factored into that is the evidence from randomised controlled trials. But if that evidence is telling you to do something that is frankly not affordable or not possible, then you're right to reject that, and you make a decision based on the wider aspects of the case. I don't think there's anything wrong with that, but wouldn't it be nice if you also had the pragmatic randomised controlled trial that was done under conditions of limited resource, and then you could draw on *that* evidence? So I would say that you are practising implementation science, or you're practising, you know, best evidence applied to your practice, but it's a pragmatic approach and there's nothing wrong with that.

Zoe Belshaw

I think one of the other challenges we also face even in situations like that can be that the outcomes that have been done...We've got a big problem with an absence of evidence in the first place, where there just isn't any evidence at all on which to make a lot of our decisions. But specifically, again, back to the ones that are done in the more referral setting, sometimes the outcomes that are measured just aren't ones that are necessarily particularly relevant to you as a vet in general private practice, or necessarily particularly relevant to the owner or the dog.

So it may be that after a lameness has been managed with a particular surgical procedure, for example, after a cruciate ligament has been repaired, the way that they'll determine success will be how much weight the dog places on its foot on a treadmill. Well, that's fine, and it is an objective way of potentially measuring that, but it's not necessarily something that the owner's going to find particularly useful as an outcome.

And so sometimes even if we do have good evidence, actually, because the outcomes in the trials that have been performed aren't clinically relevant, you still look at the evidence and say actually it doesn't necessarily take me that much further forward. And that's another challenge that we certainly face I think, even when there is evidence there, which unfortunately is quite, can be rare.

Trish Greenhalgh

That's very interesting. And it takes us into an interesting area of work in human medicine, around patient-relevant outcome measures, or patient-reported experience measures. So you have PROMs and PREMs, and it's worth looking some of those up. The way they are developed is through, first of all, qualitative research: talking and listening to people about their

experiences with a particular illness or condition or disability, and saying, well, what is relevant to you? And doing that across a big sample of people, and then coming up with a PREM and the PROM to measure an outcome.

Having said that, you know, because most of you are practitioners working with individuals, that there may be one particular individual owner/pet where they're saying the outcome that matters to them is not the one that would matter to most people. And so you quite rightly say, all right, well, in that case, in your case, we'll do it differently. So you adapt, but the idea of patient-relevant outcome measures being developed in veterinary medicine...someone should put in a PhD application for that, because it'd be great to have that happening.

Zoe Belshaw

It's started already actually.

Trish Greenhalgh

Oh, go on.

Zoe Belshaw

So at the Centre for Evidence-based Veterinary Medicine in Nottingham, Rachel Dean, who was the Director of the Centre, used the James Lind Alliance to look at a mixture of clinicians and vets putting together a group of core outcomes. And a PhD student Hannah is doing a bigger piece of work on that, looking at chronic kidney disease in cats, getting together owners and vets, having done a big online qualitative survey almost, to get people to say, what questions would you be interested in? They then used a ranking system to come up with a list of priorities that they're going to take forward as part of her PhD. So [we're] starting…

Trish Greenhalgh

That's fantastic. And just for people who are not familiar with the James Lind Alliance: this was set up about 20 years ago by Professor Ian Chalmers. It was the idea in human medicine to get patients to have an input into what research money should be spent on; what are your priorities as a patient with condition X? And in discussion between patients and clinicians, there would then be a priority-setting process to rank the things that got researched. The James Lind Alliance does fantastic work and has led to some more patient-focused research in medicine,so I'm absolutely delighted to hear that this is going on with veterinary medicine as well.

Adewole Adekola

I think another area I would like to talk about is resource-limited areas and the tension between clients and the veterinarian as well. I think from my own environment, I think I've actually noticed that happen a lot in places where interventions are actually sort of inputted from other places, because you don't have enough research in your own local context to actually look at the situation there. So you adopt methods from probably Europe or from America and all that, and bring it down to a place like Nigeria.

And you realise that at that point most times the clients actually tend to actually question the veracity of some of the evidence, because they would like the situation in those areas to be the same as what we have in this place, where the health outcome at the end of the day is also commensurate with what we get at the end of the day. If you're trying to bring in, like, probably a treatment method or a vaccine that has been tested in the UK down to Nigeria, how are you so sure that some of our strains we have in Nigeria are the same as those they have there in the UK?

So most of the time those tensions also affect how some of the clinicians, I mean, clients are actually receptive to some of the treatment options a veterinarian has offered to them. So from your own angle, how do you think that can actually be worked on?

Trish Greenhalgh

That's a very interesting question, and I would strongly agree with you that the claim of the randomised controlled trial, for example, to be universally applicable is questionable. We do randomised controlled trials, and the idea is because you've randomised, then you've kind of controlled for the effect of context, and philosophically that actually doesn't hold true. It doesn't hold true when you do trials in secondary care and try to apply them to primary care, and it doesn't hold true even more when you take high-income country trials and apply them to low-income countries for all sorts of reasons; you can't control for, or cancel out, the effect of context.

So we then have to say, well, what do we do with low-income settings, where there isn't the funding to do the trials? And in the end, often we do have to compromise, but perhaps we should be compromising by saying, well, is there any other low-income setting or any other tropical setting or whatever that we can draw insights from, rather than, you know, there's a colonialist element here, isn't there – and say, well, hang on a minute, can you take evidence that was produced in America, in the UK and simply graft it onto sub-Saharan Africa? And of course, you know, there are really big questions there; questions around the whole global health agenda – not easily answered, and probably not directly relevant to what we're talking about today, but yeah, I agree with you.

Louise Buckley

I think for me, one of the problems that I have in my head when it comes to thinking about evidence-based practice and best practice, is there seems to be a progressive move towards more and more expensive veterinary medicine where decisions are being based on one disease process and one treatment versus another treatment, etc., and life's not like that.

And I kind of think we probably need to get away from best practice to, sort of, optimising our decision-making across loads of different measures. And those include things like finance, include the time that it takes to look after the patient, they include other factors for the client. And I think the research needs to reflect, that in terms of the outcome measures. But in my mind, I almost have a situation that we need to go to almost like when you're taking a bank loan, and you have a series of slides for how long are you going to take the loan over, how much you're going to take it for, etc. And if you could do that for time, improvement in health,

etc., you could actually find the optimal point potentially for that individual or that subsection of the community.

Trish Greenhalgh

I'm fascinated by this. You've now got us to imagine looking at a computer with a set of sliders and some particular things that you want everybody to say, well, look, this is where I am on this continuum between X and Y for various categories. And then that's going to give you, okay, this is what you should do in that situation. And I think that's a wonderful fantasy idea that would be great. I get this messy, real-world problem. I could go onto my computer and I go, click, click, click, click, click, click, click, and it would tell me, this is the best approach.

And I would suggest to you that that's never going to happen, because what does happen, is your brain is better than any piece of technology in pulling together the effects of context and working out what is the best approach for this particular client, animal in these circumstances. That's what we call case-based reasoning. And the research into case-based reasoning suggests that the way we get better at it is not by making it more technocratic or by imposing technologies, but by reflection and deliberation and discussion.

So I don't know what it's like with vets, but if you get a load of doctors together within five minutes, we're talking about 'We saw a really interesting case the other day, I saw this lady', you know, blah, blah, blah, blah, blah. And what you do then, is you tell the story of what happened. And often it's the struggles that you were having as a professional, trying to make the best decision for that patient and all the things that were interfering with the patient getting the right treatment. And then the person who's listening to that story says 'Did you try this?' or 'Have you thought of that?' And actually, that deliberation/discussion reflection process is what makes you better at decision-making. And we should all be valuing that more. It's not a poor substitute for the technical stuff, it's actually the way it should be done. The technology is the poor substitute. There, discuss!

Louise Buckley

But where that becomes quite interesting...My brain thinks a lot in pictures, so while you were talking, I started to visualise the evidence pyramid. And I started thinking about the different things that you're assimilating when making that decision, and the bit that's the healthcare is probably going to come from the randomised controlled trials; our outcome measures that we're going to factor in, in that aspect, but then everything else sits at the bottom of the evidence pyramid in terms of our life experiences of what it is like to live in a busy household with children that might get in the way of you dieting your pet, for example.

So all of those factors are all sitting there at the bottom of the evidence pyramid, where we're teaching everyone to try and predominantly use evidence from the top, which is in relation to the healthcare outcomes, but then everything else is sitting there – it's our experiential experiences, and it's pulling all of those together to make a decision that's right for that patient, when the research is focusing firmly on the healthcare outcome measures and not enough on other outcome measures. And I quite often look at this relentless drive towards best practice and potentially diminishing returns to the patient's welfare that make that care more and more

expensive to the point that people don't want to own pets any more. And that's something that scares me.

Trish Greenhalgh

If that's the ultimate end of evidence-based vet medicine, that that evidence pyramid with its systematic reviews or meta-analyses at the top and its randomised trials, and then right down the bottom is what we call anecdote, and somehow the end result of that is that people don't want to own pets any more, that's really quite counterproductive, isn't it?

Now I am, to some extent, a supporter of the evidence pyramid in the sense that if I was going to make a decision on, let's call it the dog with a broken leg, I would want to have a look at what the randomised trials showed. And I would value those randomised controlled trials over and above some vet walking in and saying, 'You'll never guess what happened the other day, dog came in with a broken leg. And, you know, this is what I did, strapped a pencil to it, seemed to do all right', that kind of thing. Of course the randomised controlled trial should be above that story because it's a better form of research evidence for reasons that you all understand.

However, that's the pyramid of research evidence, and it's not just research evidence that you take into account when you make the decision. So it is also, I mean, the example of putting a pet on a diet in a house where there's a lot of kids around and it's going to be very difficult to implement that diet, is a very good example of saying, you've got to take into account the reality of that animal in the context. And you've got to bring in the research evidence that is relevant to that decision, which isn't just a randomised controlled trial of dogs on diets without kids in the house, because that's actually less relevant.

So I would say the evidence pyramid is fine and important in terms of assessing the value of research evidence, but there's also contextual evidence. And the way you pull it together is, you tell the story, you bring the narrative, you give the account of the client or the animal in context, and that's not just about the research evidence – very, very important.

It's suddenly struck me that around this table we've got a skewed sample of vets. We've got vets, who've got Master's degrees and PhDs, and who work as university lecturers in evidence-based practice. That's not reflective of everybody out there, and I know from my work with health professionals, with doctors and nurses and physios and things like that, the people who come on the courses are the ones who were already kind of turned on to the whole notion of using evidence. And I think it might be worth discussing, hang on a minute, there's vets out there who don't even read the evidence, who have no idea about the evidence and who don't respect the evidence. They've never heard of the pyramid, all that kind of thing. And perhaps we should discuss a little bit, hang on a minute, how are you going to influence those people?

Laura Playforth

I was just going to say something slightly different before we move on to that, about one of the things that we've tried to do in Vets Now, which runs along a similar sort of lines of how to use the evidence. Instead of having clinical guidelines, what we've developed is more clinical checklists, so it acts as a bit of a structure or a framework for the thought process on that

individual case. So it's a bit of a prompt in terms of not to forget to consider something, but also it can be used to structure that discussion with the pet owner.

So we've got a few in place at the moment which are divided up by different presentations in the out-of-hours scenario. So for example, we have one for dystocia for whelping bitches, and it is structured a little bit like the surgical safety checklist in time periods of taking the history, and when you're in the consultation, the physical exam diagnostics, etc. And it acts as a bit of a prompt for, for example, the diagnostics – have you considered ultrasound? Have you considered X-ray? And there's a little bit of information, very high level, about what the evidence is for considering these things, but then that can prompt you to have the discussion with the client - this is why I want to do this, this is how much it's going to cost, and the risks of not doing this are X, Y, and Z.

Trish Greenhalgh

That sounds fantastic. And I think one of the things that is happening in evidence-based medicine is a realisation that although clinical practice guidelines are often, you know, very robust and rigorous and all those kinds of adjectives; actually, they're completely unworkable because they're 150 pages long and they don't actually take you through the care pathway, if you like. And we are developing shorter, more pragmatic, more visually appealing summaries of evidence, and one of the areas that we're doing that is in evidence-based care pathways.

Bundles is another thing, where you have a patient who is about to be discharged from hospital, and, guess what, the junior doctor is about to write the discharge letter and there's 10 things or five things that that junior doctor needs to do. And it's all the evidence-based things that should happen at discharge, but they're all kind of pulled together in one place. And again, it's done as a checklist, and of course, junior doctors love it because they can go tick, tick, tick, tick, tick, and that's a very good and concentrated way of supporting evidence getting into practice. As you and I know, it doesn't guarantee that the evidence is going to get put into practice because in the end that practitioner, you know, you and I are not there when they're doing it. And so it's a question of 'Have you considered...?' rather than 'You must do...'. But yes, this sounds really positive and a really great idea.

Laura Playforth

And I think moving on to your next point about how we engage people who are not already engaged in implementing evidence-based medicine, one of the tensions we've found as a larger group (although we're not one of the largest in the profession, we are a large group with a lot of different sites), is that tension between trying to get everybody engaged in developing something, and having five or six hundred clinicians who can't all be involved in creating something.

And I was interested reading through one of your papers that you sent out to us before this discussion around letting people in practice adapt to their own context and their practice situation, which I think is a fantastic idea, although there is a tension again with that and people working across our different sites, and the fact that if they go into practice X and the checklist is

one way, and they're going to practice Y, and the checklist is a whole other way, then that can cause a risk for mistakes as well, I think.

Trish Greenhalgh

Yes, I think that's right – that the meshing of the recommendation with the context in which it's going to be implemented, is never perfect. There's always going to be....Now we have words for this. Articulations is one of them, workarounds, compromises, Annemarie Mol calls it 'tinkering'. So those little fiddles that people put into place in order to try and make, you know, this counsel of perfection actually applicable at the front line. Now, sometimes that's a good thing because it makes it more likely to happen. Other times it's quite awkward, and as you say, can lead to errors. Have you got an actual example of that?

Laura Playforth

Well, I suppose most things that we have tried to implement across the business, we tend to get very variable uptake. And obviously those who've been involved in developing it are, tend to be, much more engaged because they've been a part of putting it in place, and people who've got an interest in that specific area or that thing that we're trying to improve tend to be very engaged with it. Other people would perceive it as more of a top-down implementation because they've not been involved with it and haven't been part of it. So the uptake tends to be very variable.

But also then people will go away and adapt and adjust and knock this box off because they don't like that one and put something else on. And some of them are definitely improvements and make it better, but then somebody else has a different idea and improves it in a different way, and then you end up with two different versions. So thinking back historically, I think probably our best example of that would be our old hospitalisation sheets – people would download them from our intranet and adapt them to their own setting. And then you'd go out across, you know, 50 or however many clinics we had in those days, and you'd probably see 50 different versions.

Trish Greenhalgh

Interesting. And what kind of adaptations would they...?

Laura Playforth

So they'd change the time periods, they'd add on different things that they wanted to record, and they would really end up very divergent. And I think when you've got staff working across different sites, and locums who, you know, walk into a Vets Now clinic and they kind of expect that they're all going to be the same. That can be very confusing when they've got very different methods of recording clinical information.

Trish Greenhalgh

This is very, very interesting. So I would say that your hospitalisation sheet is an example of what we call a complex intervention. In other words, it's an intervention that needs to involve

human behaviour. It needs to involve changes in how the organisational routines happen, all that kind of thing. And it, it can be implemented more or less faithfully - you call it the 'fidelity' of the intervention.

Now, the question is how much change might happen to that intervention before it is no longer the intervention that you started with? And there's some interesting work by a woman called Penny Hawe (H-a-w-e). And she wrote a paper quite some years ago, that was published in the *British Medical Journal* called 'How out of control can a randomised controlled trial be?' And with her co-authors she made the theoretical argument that there are certain things in a complex intervention that make it the intervention that it is. And there are certain other things that really could be changed or dropped or improved on - and yet you still got the basic intervention.

So for example, we did some work around storytelling, and we found that people with diabetes liked to tell stories about what it's like coping with their diabetes. And so we developed an intervention called the story-sharing intervention, and we did a randomised controlled trial of it. And guess what? Every site implemented that intervention very differently. So some of them, for example, provided refreshments for the patients halfway through the session, and some of them had a greater or lesser level of instruction as to what kind of stories were allowed. And we said, that's fine, but the core intervention is that there should be spontaneous sharing of stories and people should be allowed to tell whatever stories they want in the way that they want.

So if someone came in and said to people, you've got to tell your story, according to this template, that then stopped being a story-sharing intervention. But in terms of how long the sessions were, whether there were refreshments, whether there was a facilitator or not – we said, no, that's all right. And so we characterised what it was that made it not the intervention. Now, we were doing that because we were running a randomised controlled trial (which is not something I do very often, I have to say, because it's not the main thing I do in my research), but I think the idea that it's okay to adapt an intervention, provided that the theoretical core of that intervention is retained, and perhaps even enhanced…And so, I mean, Jean-Louis Denis talks about the 'hard core' and the 'soft periphery': every complex intervention has a hard core, which you can't change, and the soft periphery, which you must change in order to embed it. So I think those are quite useful concepts when you're trying to implement an intervention. But in general, I like to be fairly permissive; I like to encourage people to adapt things, because I think they work better when someone's adapted them to context.

Zoe Belshaw

I was just going to go back to your point about the challenges of getting people interested in evidence-based veterinary medicine, and the fact that there are people who really think that it is a very top-down prescriptive thing, that it eradicates their experience, that it's saying that actually experience is totally invalid; you have to use these randomised controlled trials. And these are things that you see vets saying on social media, that you see in discussions.

And I think we have to acknowledge that there are lots of barriers to people being able to access the evidence and being able to implement it – you know, time pressures are huge in

veterinary practice. If you're consulting all day as I do on a Monday and Tuesday, and I start consulting at nine, I'll do 10-minute consultations with a half-hour break, if I'm lucky, until half past 12, then I get a lunch break, and then I'll start that again for another three hours in the afternoon. And I would love to be able to look up the evidence while I'm working, but I have 10-minute consultations, multimorbid animals with multiple presenting and non-presenting problems, with often quite a challenging client base.

And you just can't a) have the time to do it and b) also in a clinic setting, it's very difficult to access the evidence, because we haven't got amazing resources like NICE [National Institute for Health and Care Excellence] to be able to look up evidence summaries. RCVS Knowledge provide some, there are some CATs, so critically appraised topics. We at the Centre for Evidence-Based Veterinary Medicine have made BestBETs, which are again, these little snappy evidence summaries of clinically relevant questions. And we've tried to disseminate those via social media by creating things like blog shots, so a single PowerPoint slide that summarises the question and the evidence, which then links back to the original BET.

But it is tremendously difficult to get sceptics to engage, and I think the big barriers for me are time and actually being able to access the evidence and having the confidence to be able to look at and appraise that evidence, or having the skills really. And also this fear, I think amongst some people, that actually it is taking away from them, their sense of what it is to be a vet, which is the art more than the science. I don't know what you think about that.

Trish Greenhalgh

Yes, and I think that what you're saying Zoe, that was a great summary of some of the challenges with evidence-based practice, and certainly medicine and nursing and the allied health professionals like physiotherapy have all been through exactly this experience. I would say that evidence-based medicine does need to take some responsibility for threatening the sense of professional autonomy. This idea that someone who's been doing it for 20 years really knows nothing until they've looked at the latest randomised controlled trials is quite insulting, because accumulated professional experience is a kind of knowledge that should not be dismissed out of hand, it's very important. You know, if I was sick, I would want to go to a doctor that's been around for 20 years, rather than one that just qualified yesterday, whether or not they'd just come top in the exams, and we all know why that is.

I wonder if it's useful to bring in here the concept of mindlines. Now John Gabbay, who's a doctor, and Andrée le May, who's a professor of nursing, did some work about 15 years ago where they watched general practitioners in their clinical practice. And they sat in the GP surgeries and watched as the patients came and went. And after several months of observing, they came to the conclusion that never once did the GP pull out a guideline in the middle of a consultation. They simply don't do it. They didn't look at it on the wall, they didn't look at it on the computer, they didn't have the guideline in a drawer.

What they did was, they talked about cases with each other over coffee, over lunch or that kind of thing, and also increasingly these days on social media. So there's a doctors' Facebook group, which you've got to prove you're a doctor be a member of, and anonymised versions of patient problems get posted on there. So I've got a lady with a cholesterol level of this. Everything else

is fine. Do you think I should refer her to a specialist? That kind of thing. And then the other doctors will come back saying, well, the guideline says you should, but I wouldn't. And so what you get there is a kind of collective understanding, a collective wisdom based both on experience and on some people's reading of the guidelines. And that's what John Gabbay and Andrée le May called the 'mindline': the collective understanding of what to do in practice.

Now that is actually tapping into a much broader definition of knowledge than simply the research evidence. And I would suggest that experienced vets and perhaps even more so newly qualified vets are a part of that mindline. And they have to be part of the community of practice, they have to engage with their wiser and older vets –'Help me with this problem'. That's not something that evidence-based practice should be dismissing; that's something that evidence-based practice should be supporting and engaging in. I've actually got two PhD students who are looking at the philosophy of knowledge in evidence-based practice and saying that we've got to move beyond the RCT [randomised controlled trial] evidence.

Adewole Adekola

I think what you just said now, it just goes back to the whole idea of peripheral learning, where you're bringing in the new vets into the community of learning of people with broad experience, and trying to learn from their own experience over time, even though they're not bringing out the guidelines and everything, but they're using the accumulated experience and all the anecdotes or contextual experiences also they've had over time to also teach the younger ones how to actually do some things better.

Trish Greenhalgh

Yes, and of course, you know, veterinary medicine, just like medicine, just like nursing – we learn a lot through apprenticeship. We learn a lot through following the expert around and, if you like, imbibing and embodying a complex approach to clinical practice. Now, one of the things I wanted to talk about in this podcast was something called social cognitive theory, which was developed by a psychologist called Albert Bandura. And what he said in social cognitive theory is that if you've got someone who's a novice at a particular topic, if they see people that they respect doing something, and if they gain practice in doing it, and if they get support to do it better, and as they gain confidence in doing it, then they're much more likely to change their practice. So it's observing people that you respect, it's practising it on the job, it's getting help to improve how well you're doing it. And it's also boosting confidence, what people call self-efficacy, then you're much more likely to do it.

And what that means in practice is, don't spend too long sitting your students in a classroom with the whiteboard and talking about the theory - get them in practice apprenticing to experienced practitioners, get them doing it and giving them feedback on how well they're doing it. They're much more likely to undergo a sustained change in what they do.

Imogen Schofield

I think that's interesting. I think drawing in from that slightly, bringing in my own experience with talking to colleagues of mine, that from the angle of a more recent graduate, and I think being the apprentice in a sense I think there seems such a huge variety in what practice you

start out at. And I think I've been very fortunate working in a big practice with 10, 11 vets, and some really experienced vets. And I've found that invaluable, but talking to colleagues who might be a vet at a branch practice, or kind of they're there because they need a vet and a recent graduate's often all that's available, or something like that.

I find that's been the challenge with talking to a lot of my colleagues, that almost having the experienced vets around them is not there. So I've found it invaluable and I think it is a very powerful way of bringing in the evidence base but I think some practices that might be small or don't have the power of a big practice group behind them, I think those might be the ones that struggle to take that approach with them. And I don't know if that comes in with anything in medicine.

Trish Greenhalgh

Most certainly. And right at the beginning, when I was asked for a definition of implementation science, one of the things I mentioned very briefly was the question of what kind of organisation helps people put evidence into practice. And you've just articulated a number of different features of organisations that make it more likely that people will be able to, if you like, be evidence based while working there.

And one of them is size; not because big is necessarily better, but because very often, if you've got a larger organisation, it's better resourced and it's more likely to be a learning organisation, meaning it's got the systems to, for example, horizon scan, it may, for example, have a budget to have a library. It may have better IT facilities, so that you can get onto the internet and look stuff up. There might be someone whose role it is to horizon scan and look beyond the organisation to say, well, what's coming up? And someone would be that knowledge person in that organisation. And then there might be, for example, a weekly or monthly meeting where people would all get together and discuss the evidence that's been published since the last meeting; there might be a journal club. Those are the kinds of things that are more likely to happen in a large organisation.

But in addition to that, there are things like the leadership of the organisation. So, for example, the larger practices might be a training practice. They might have an explicit strategic goal to be evidence based rather than just kind of make a living, for example. They may have systems in place to measure and monitor the extent to which practice is evidence based, and all those things are more likely in, you know, the larger practices. You know, it's harder, if you like, to have the organisational preconditions for innovation if you are smaller and more isolated.

Zoe Belshaw

I think as a profession, we're still struggling with justifying finding the time to do things like journal clubs, to do things like practice meetings, to do things like audit – to determine whether or not actually what we're doing is any good. We're almost just on this hamster treadmill all the time, that we need to keep seeing cases, we can't stop, we need to keep seeing cases, we need to keep making money. The queue of people that want to come in, it's not worth stopping and justifying even within the big organisations, I think unfortunately, that it is beneficial for vets to

sit down outside just regular tea and coffee breaks to discuss clinical cases, to discuss the latest evidence, is tremendously challenging.

And I think it's...I don't know how many practices are now doing that. Certainly it's more common in the tertiary referral centres, but in general practice, I think those are things that would be really, really useful, but unfortunately aren't being prioritised because it can be difficult to justify financially when you've got people that are managing you who aren't necessarily vets, why it is worth doing that. And equally, I think that's one of the barriers to people attending workshops and conferences related to evidence-based medicine and evidence-based veterinary medicine. Because again, you've got a financial budget for CPD, and when you're trying to justify what you go on, either you could go on a fantastic two days, Evidence Live in Oxford, and learn loads about how to learn, how to think and what the evidence situation is. Or you could spend that money learning how to go and do a new cruciate procedure that would immediately be transferable back to your practice and make you more money. We're just at the beginning of that journey. And I hope that was not being too pejorative to us as a profession, but I think realistically, that is still where we are.

Trish Greenhalgh

I think that you really articulated that well, that of course, you know, learning how to do a new cruciate procedure is also important, particularly in the short term; on the other hand, learning about the nature of evidence and how to implement it, could, strategically speaking, be more important for the organisation.

But I do remember a few years ago I was organising some one-day workshops for practice nurses on evidence-based medicine or evidence-based healthcare. We put together a programme with the nurses, we co-designed it. And then we wrote to all the GPs who controlled the training budgets, saying, please can you send your nurses on this? We've tried to make it affordable. It wasn't very expensive. And the GPs said, well, no, because my budget is going to send this nurse on an asthma cause, and this nurse on a diabetes course because then I can then put that nurse in charge of running the asthma clinic or the diabetic clinic.

So it's a question of short term versus long term. And I absolutely understand the pressures of the single-handed practitioner or the small business thinking that the short-term benefits are, you know, more of a priority. I can't solve that, but I think we all realise that it would be really nice if people took a longer view as well.

Laura Playforth

I think even working in a larger group as we are absolutely fundamentally committed to doing as much as we can that is evidence based, and our clinical and professional standards are the absolute driving force of what we try to do, but the cost of being able to do them is so high that ultimately either you have to stop doing something else, which you get to a point below which you can't stop doing other things because you need to do them to keep the business running, or ultimately you have to put up the cost to the pet owners. And as we've discussed earlier, you know, there is a real concern about costs going up and up and up. And that is a difficult tension for large companies as well as small practices.

Trish Greenhalgh

I'll tell you one other thing that has really come in big-time in evidence-based medicine is disinvestment. So I've been abroad three times in the last 12 months to go to conferences around disinvestment. In other words, stopping doing things that have a weak evidence base or where the evidence base says, there's no point in doing these things - what we call low-value interventions, low-value treatments, low-value tests. And the argument is that if we stopped doing the things that aren't worth doing, we would then have time to do the things that are worth doing, better. And I just wonder whether there are any, either tests or procedures that take a lot of your time that cost money, but really you don't get very much benefit from those, because wouldn't it be brilliant if we could stop doing those things?

Laura Playforth

I think it'd be great if we had more evidence of what was worth doing and what wasn't worth doing, so it's a bit of a vicious cycle.

Trish Greenhalgh

I'll tell you one example. I don't know anything about veterinary medicine, but certainly in medicine, human medicine, arthroscopies are coming in for a lot of stick. Diagnostic looking into joints is quite fashionable, particularly in the private sector, because, guess what, the orthopedic surgeons, you know, make quite a lot of money out of it – but there's not a lot of evidence that it benefits, and actually there's some evidence that it doesn't benefit, if you see what I mean. I mean, do you do arthroscopies and could you stop doing them?

Zoe Belshaw

They are done, definitely, and I don't know if we have the evidence yet as to whether or not we could stop doing them. Certainly people will do them still prior to doing cruciate ligament repairs in some centres, but now they're essentially being replaced, or certainly supplemented, with increased diagnostic imaging of MRI scans, CT scans of the knee joints.

Trish Greenhalgh

Yes. I'm just looking because somebody tweeted something yesterday and the acronym was BRAIN. So the idea with what they're trying to do with disinvestment, is get the patients on board, so that actually it's the patient who says to the doctor, 'Do I really need this?' rather than having those awkward conversations where the patient assumes that they need the tests and the treatments, and then you're trying to talk them out of it. So the idea is it's going to come from the patients. Now, let me see if I can remember what the BRAIN acronym is.

Zoe Belshaw

Benefits, Risks, Alternatives and do Nothing is the BRAN.

Trish Greenhalgh

Okay, so the 'I' is Instinct. So what are the benefits of this test or this treatment? What are the risks? What's the downside? What are the alternatives? What is your instinct?, which I think is a wonderful question – what would you have if you were in my position? And then, what would happen if we did nothing? I think the idea that someone bringing their pet to the vet, for example, would have that BRAIN acronym rather than say, you know, please can you do everything, all the tests, and I want all the injections and everything, all the operations - actually, owners don't want that, never mind about the cost. They actually don't want to put their pet through it.

So yeah, it's equivalent again to the parent, bringing the child to the GP with the cough. The stereotype is that the parent is demanding an antibiotic, but I've been a parent, I don't want my child on antibiotics if they don't need it. And, you know, the idea that patients, clients are our allies often in disinvesting, provided we have a proper conversation and a democratic conversation. So I think there's quite a lot of interesting work around disinvestment in vet medicine that we could draw insights from the human.

Zoe Belshaw

I agree. And it leads to an interesting conversation, I think, that we're having in veterinary medicine again at the moment around almost the role of the educated client. I'm sure you in human healthcare have the same sort of memes of 'Don't confuse your Google search with my medical degree'. We absolutely are having that conversation about 'Don't confuse your Google search with my veterinary degree'.

And there's quite a degree of worry, I would say, amongst quite a lot of vets about owners having knowledge; there's almost a move to limit the resources that are available for clients to actually learn for themselves (which I'm passionately against us doing) to almost say, well, the only resources they should be reading are things that we've given them. And you've got fantastic websites like NHS Choices in human healthcare, and yet we really don't have a universal version of that. The PDSA are working on making one called the Pet Health Hub, which they're trying to Google optimise, which has got, you know, downloadable information sheets.

But I think moving towards recognising the value of the client as our partner, and wanting to have an educated client, is something that we're quite a long way from. And I think there are lots of barriers to clients getting that information. And I think for me, an interesting one I'm just starting to realise, is around actually the role of the media and how pets are reported. So, for example, on Radio Four, you'll have ‘Inside Health’, you have ‘All in the Mind’, which are two fantastic programmes that talk about the evidence base, interview experts...If you look at where the media, for me, reflects pets, it's all, 'There's a cute duck that's stuck on a pond', or 'There's a cat stuck up in a tree', or 'Let's laugh about this fat dog that's rolling around'. And actually it's really difficult for owners to access anything that is actually good quality evidence.

Trish Greenhalgh

Yeah, wouldn't it be great to have something equivalent to any of those programmes. So you're talking about the empowered clients coming in with a wodge of information downloaded from

the internet or whatever. One of the things that I've been arguing in human medicine is that the empowerment of the patient doesn't imply the disempowerment of the doctor. And I think if we can get across the message that just because your client is very knowledgeable, that doesn't take away your knowledge, and it doesn't, or shouldn't threaten you as the practitioner who is still the professional, but that you need to have a different kind of dialogue with the client who's coming along with that information: what is your understanding of it? How do you want me to respond? All that kind of thing. But certainly I would emphasise that the empowerment of the patient does not imply the disempowerment of the doctor. We have to rise above that zero-sum approach to patient knowledge.

I think we've covered an awful lot of ground, so I was going to pitch it back to the others around the table and ask them if there was anything that they wanted to raise.

Louise Buckley

It's really just a practical issue. We've talked quite a bit about large organisations finding it easier to implement EBVM, but we are in a culture where we have a shortage of veterinary professionals, where there's lots of practices that at various points in time are operating largely on locum vets and locum veterinary nurses. And I wondered what people's thoughts were in relation to how we implement EBVM in a veterinary practice where the umbrella company culture is EBVM, but on the local level, people won't know necessarily about the policies, there isn't time to learn about the policies in place at that veterinary practice, the checklists that are in situ, etc. - How we marry those two situations in order to allow EBVM to be practised?

Laura Playforth

I think one of the things we've found, it depends if you are running entirely on locums or whether you've got a team of, for example, permanent nurses and veterinary locums, or vice versa, and then one team can lead and influence the other. And nurses are particularly adept at doing that. And if you've got all locums, then that is very difficult and very different, and sometimes you try to, you need to have somebody else to lead that, whether it's somebody else from a different clinic coming in, or whether it is some of your non-clinical staff helping to make suggestions and help facilitate some of those processes.

Trish Greenhalgh

I think that this really illustrates the issue around having a quality culture. And I totally agree with you, that if you've got a kind of critical mass of people who are reflexive, who are committed to excellence and who know broadly speaking what the evidence base is, and of course who can access the relevant support artefacts, like the checklists and things like that – then when someone is doing a locum, then they fall in with that culture.

Laura Playforth

Can I ask if you have in medicine successful examples of practice management systems being used to facilitate some of the processes?

Trish Greenhalgh

Interesting question. There has been a big debate around evidence-based medicine as to the extent to which it has been managerialised. Now I'm old enough to remember right at the beginning, there were a few of us saying, let's write some guidelines and then let's make everybody follow them. And the way we're going to do that is we're going to punish them if they don't follow them, or we're going to build it into their pay packets. And of course that felt very good because we were in some kind of evangelistic movement that we were pretty sure we got, you know, evidence-based practice, and everybody needed to follow it. Now it doesn't feel so good when you are the practitioner in the local surgery, and this directive comes and says, you must implement this and then you get the push back.

Having said that, I think that one of the things that has worked really well is the managerialisation of certain aspects of evidence-based practice, and let me give you just one example. When I first went into general practice, which was about 30-something years ago, hardly anyone had an up-to-date blood pressure recorded in their notes. Now, the best way you can prevent strokes is by controlling people's blood pressure and you can't control someone's blood pressure if you don't know what it is. So the Quality and Outcomes Framework was introduced probably 20 years ago. And the first thing they did was, they paid GPs to record the blood pressure of every adult.

And then after a few years, they changed the payment system to say, well, you can only get paid if that blood pressure is within the range that we want it to be, you know, it's no good recording a blood pressure is 200 over 100 if you haven't done anything about it. So the first thing they did was, they paid the GPs to record the blood pressure, and then they changed it: right, we'll pay you if 80% of your patients have got the blood pressure in the level we want. Guess what? Fewer people have strokes these days, so that's not a bad thing. And sure, there are still GPs that moan that they're being made to do this or that they're losing money if they don't do it, but hey, it's quite a good thing to do.

However, if you look at the arguments around the Quality and Outcomes Framework more broadly GPs will say things like, well, we're spending so much of our time chasing our tails and doing the things you put in the QOF, as it's called, if something's not in the QOF, then we don't have time to do it. And so we're then detracting from all the things that we should be doing, like, you know, listening to old ladies who are lonely or whatever it might be, so of course there has to be dialogue and debate around that. But I think a little bit of managerialisation of something that is robustly evidence based is not a bad idea.

Imogen Schofield

Can I potentially open a can of worms with this one, in that we're very much talking about it being based around a practice, and it's dependent on that practice management of implementing something for that group or practice, whereas do you think it should be more broad across the profession? So I know that RCVS [Knowledge] do kind of their Knowledge Summaries and are very much an advocate of this, and use of them in practices, but on the human side of things within the NHS, there are kind of more broad guidelines or

recommendations across the UK. Do you think we should be looking at this, not from putting a lot of emphasis on the practice, or should we be looking at this more from a higher body?

Trish Greenhalgh

[Laughs] There's an interesting thing. So what you've got in human medicine or human healthcare, you've got NICE obviously, a government body or government-funded body to put the evidence out there. And also if a drug becomes NICE-approved for certain conditions, it's quite difficult for clinical commissioning groups to say, we're not going to fund it. It does happen sometimes if you haven't got the money, but usually, you know, NICE approving something makes it much more likely that you'll be able to get it on the NHS. So that's one area.

You've then got the professions, the professional bodies. You've got the Royal College of GPs, Royal College of Obstetricians, etc. Etc., so those are the professional bodies. You've then got local CCGs [Clinical Commissioning Groups], but also the local medical committees, the GPs organising themselves locally. You've got the universities and the postgraduate education programmes - so what we used to call the Deaneries. If I'm overseeing the professional development of a GP or a public health doctor, I have to sign them off to say, yes, they've achieved a certain competence in evidence-based practice.

And then, as you say, you've got the individual healthcare organisations, either the GP practices or the hospitals or the departments. So all these things are happening in parallel, and it's not that one is driving the others; it's that we have a complex system. What you need is work at the professional level, work in undergraduate and postgraduate education, work with patients and the public - all the things we've been talking about; they're not mutually exclusive, they all have to happen in parallel.

Lara Carim

On that note, I'd like to thank all our participants today, particularly Trish Greenhalgh for hosting us and to our guests, Zoe Belshaw, Louise Buckley, Laura Playforth, Imogen Schofield and Adewole Adekola for their thought-provoking insights and giving up their time.

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