



## **Infection control and biosecurity: auditing - transcript**

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### **Tim Nuttall**

Hello and welcome to this RCVS Knowledge webinar. And this is part five of a five-part series looking at infection control in veterinary practice. And this part will cover all auditing, the use of audits and the role of auditing in benchmarking and monitoring infections and progress.

Most of the presentation will be given by Dr Pam Mosedale and we're very lucky to have her to present this. Pam has spent nearly all of her working life based in practice, so she's fully aware of how practical this needs to be, but she's also well known to many of you as one of the country's leading experts in infection control. A couple of examples of that: she's a Clinical Advisor for the Bella Moss Foundation, she chairs the Quality Improvement panel for RCVS Knowledge and she's also the lead assessor for the RCVS Practice Standards Scheme.

Pam will, as I said, do most of the webinar and will cover the theory of auditing, why this is important and then use some practical examples to illustrate its importance in infection control and veterinary practice. And then I, sorry I should have introduced myself, I'm Tim Nuttall, I'll come in right at the end and just discuss a little bit about how to use auditing and benchmarking to look at trends in antimicrobial resistance and antimicrobial use.

[New slide] So RCVS Knowledge is an organisation that is committed to advancing the quality of veterinary care for animals, their owners and the wider society. And it does this by championing the use of evidence-based approaches to inspire a culture of continuous learning and quality improvement. And we do that by making our resources widely available to the profession and the wider public. I must note that we are a separate organisation to the Royal College of Veterinary Surgeons, even though we have RCVS in our name. And if you go to the website at [www.rcvsknowledge.org](http://www.rcvsknowledge.org) you can find out more about us and our activities and then also get access to the incredibly wide range of support materials that are there.

[New slide] As I said earlier, this is part five in a five-part series. So just draw your attention to the whole series of webinars that have been looking at infection control. The first webinar looked at the importance of infection control and steps that might need to be taken to enhance this and adapt to working during the COVID-19 pandemic. But then obviously all the other infection control threats that we see in practice haven't changed. So part two has looked at current organisms of concern and how these can be transmitted within the veterinary practices. Part three looked at infection control policies and procedures in practice. Part four covered different types of disinfectants and how to use these and

other infection control procedures more effectively, and this will be part five, again, as I said, looking at auditing and benchmarking.

### **Pam Mosedale**

[New slide] Okay. Thank you Tim. So I'm going to talk to you now about auditing infection control measures. Well, I'm going to try and cover, or Tim and I are going to try and cover, is what clinical audit is, and how is it anything to do with infection control, things that we can audit like cleaning protocols, like checklists, like hand hygiene, the role of surveillance; auditing things like postoperative complications, which can give us an idea of the state of infection in the practice; benchmarking, significant events, and as Tim said, he's going to talk about antimicrobial resistant organisms at the end.

[New slide] So I'm going to start off, for any of you who don't know, talking about quality improvement. What is it then? Quality improvement or QI, it's not just a programme that is on the telly with Sandy Toksvig. QI is the combined efforts of everyone to make changes, to lead to better patient outcomes, better performance as a system, better systems of work, better learning, better professional development. And surely that is what everybody in veterinary practice wants in all the areas where we work to improve the outcomes for our patients, to improve the systems of work for ourselves and to learn from things.

[New slide] So I'm going to use the quality improvement tools to talk about audit of infection control. Those of you who are interested in quality improvement, I would recommend the RCVS Knowledge quality improvement website. And if you look on resources there, you'll see on the screen here, that there are resources there about clinical audit, about writing guidelines and protocols, about using checklists, about benchmarking, about significant events. All the things we're going to talk about are all there. There are CPD courses for most of them, which are free CPD. There are case examples for all of them. So I'd really recommend that you have a look at those. But what I'm going to hopefully do now is see how we can apply some of those quality improvement tools to looking at infection control.

[New slide] Okay. So clinical audit then, what is it? Well, it's basically just about understanding what we do, measuring what we do, collecting data in an area of our practice and seeing what results we're getting. If you don't measure things then how can you know how clinically effective you're being or how effective your cleaning is. If you don't measure it, you don't know what needs to improve, you might measure it and find that you're doing absolutely great and nothing needs to improve. Or you might measure it and see there's some room for improvement. But that's what audit's for. It's there to monitor and assess areas and look for areas where it could be improved and then put that improvement into place.

[New slide] So how is this relevant to infection control then? Well, as I said before, just said, it's about providing real data for the practice, things that actually applies to your particular practice, not just generalize things, things that happen in your particular practice. So it'll give you real data in your practice about the areas where your infection control procedures are working well and maybe areas that could need improving. This will lead, I hope, to improve biosecurity generally, should lead to improved outcomes for patients and it should be safer. It should be a safer culture for patients and also for the team because obviously some of these infection control measures affect team health as well. And that's particularly important at the moment. And looking at drawing up these protocols and guidelines and things does encourage the team to look at evidence-based medicine and incorporate that into the protocols and guidelines.

[New slide] So this is, I'm sure you've all seen the clinical audit cycle lots of times, but this one I really like rather than the traditional cycle. This is the one that came from originally from the Royal College of General Practitioners, but it's also the one that RCVS Knowledge use. And basically you choose a topic decide what you're going to measure. It's got to be something that happens fairly frequently or it's going to take an awful long time to collect your data. Select exactly what you're measuring, exactly what your criteria are, set a target, what you want to achieve, collect the data, analyse the data. And then the really important thing is number six, look, discuss with the team what the barriers were. If you haven't achieved your target, then discuss with the team what the barriers were. Why didn't we get to that target and what can we do now to alter that? And the people who know that are the team on the ground, the team who are actually doing things. It's no good discussing infection control at high level without discussing with the people on the ground are actually involved. Everybody. Clinical audit is a whole team activity. So analyse the data, make the changes, implement the changes are equally important - do it all again. Repeat it, re-audit it and see whether the changes you've made have actually had any effect or not. And then review and reflect. And decide when you might need to audit again.

[New slide] Okay. So getting on to infection control then, I'm sure that most of you have cleaning protocols. And if you look at the webinar that Liz Branscombe did, number three in our series, there's an awful lot there about cleaning protocols and having cleaning protocols for different areas of the practice. And there will be different requirements for different areas. And in those protocols, drawing up, looking at the evidence base, what you should clean, with what, how often, who does it, all those things in detail. And then what most practices proceed to having are checklists, cleaning checklists, up on the wall that can be ticked when certain cleaning things have been carried out.

Now lots of practices think that its best to have these on paper because then we can keep them and therefore they can do an audit and keep an eye on them. But from an infection control point of view, it's not so good that they're paper, but they really need to be as laminated, so they can be just written on with a suitable pen that writes on them and can be wiped off. So that's the question then if you use these checklists, that's fine. You can check to see on the day whether it's been done, but how would you audit it?

My recommendation for auditing checklists, cleaning checklists, would be that somebody goes around and takes photos on their mobile phone at certain times and you can do it at different times on different days just to see what's been done. And then looking at these, you can look back and go, okay, well this cleaning task is always done, but this cleaning task has not been done by four o'clock in the afternoon. Why's that not happened? And then talk to the team and find out, well, we couldn't do that because we're very busy in clinics at that time and whatever. So look for the barriers, make some changes and then do it all over again.

[New slide] So another way to look at auditing cleaning is using a self-audit tool, which Bella Moss Foundation have on their website, and which myself and Tim and Louise O'Dwyer, who's unfortunately no longer with us, we drew this up. Basically, we did draw up those cleaning protocols that I was just discussing for every single area of the practice. They need to be personalised to the practice, but it mentions every single thing that's in there and how often it should be cleaned and with what and by whom. So the practice can use those. But then the other thing is to try and monitor and audit how that's working. So one way to do this is using the app, which can be on your mobile phone. And I think the key here is to send somebody around who's not the person who's done the cleaning. Someone else go around. And there's a little checklist there with a score. So say, you know, is the floor clean right into the corners. Is the sink clean, is the plug hole clean, things like that. And there's a yes/no for each one. And

that's for every area. And then at the end it will give you an overall hygiene score, if the person has been round the whole practice, for the whole practice, which might be hopefully something like 98%, but it might be 70%. And then you need to look at the areas that didn't score and start looking at what you can do and why that didn't happen. And again, make changes and this is such a simple little self audit tool that you can use it really regularly. So I would definitely recommend that.

[New slide] Okay. Let's get onto a clinical audit then of hand hygiene. Very, very topical at the moment obviously. Hand hygiene, very, very important. I mean, how many times have we been told by the government about washing our hands and washing our hands for longer and singing happy birthday or whatever it was they told us to sing. But basically I'm going to describe to you an audit by Gillian White RVN, who's very kindly agreed to let me use this, which was carried out at Vets Now in Glasgow. And their hand hygiene audit was by observation of team members, by watching people and marking a chart of what they do and when.

Now, the only thing I would say at the beginning of this before we look at their results is the audits that you do by observation are really, really useful, but you can tend to get something called the Hawthorne effect. Whereas when you're watching people and they know that you're watching them, they will improve what they're doing. It's called the Hawthorne effect, it was a factory in Chicago in a place called Hawthorne that they first noticed this. So it's the effect of people observing you can make you do things better. So the results can sometimes be higher, but I think people get used to it and after that start to forget that you're watching them eventually.

So they chose key moments where they thought hands should be washed and these will be before any contact with the patient, after any contact with a patient, before an aseptic task, after exposure to bodily fluids and after exposure to patient surroundings. So on all those occasions, the team member and they looked at all team members, I said already, that this is a whole team activity. This is a matter of looking at all team members from the most senior vets in the practice, through all the vets and nurses and any kennels staff and everybody else, all were watched to see when they wash their hands.

[New slide] So it was just a yes/no. Did they actually wash their hands properly? Yes or no. And did they do it at those times. And the reasons for non-compliance were that they didn't do that in those times, but also so they just didn't do them or they didn't do them properly. And that was, that they hadn't taken off jewellery or watches, they weren't bare below the elbow, they hadn't rolled their sleeves up, the soap was put on before they'd wet the hands, they washed their hands too quickly, they used hand gel when they should have washed their hands, turning off taps with your hands rather than the elbows even though they were elbow taps. Not washing hands after gloves removed and when putting anything into the bin, operating the bin by hand and not using the foot pedal.

So I think those are all things that, you know, especially when we're rushing, that we can fail on, or we can forget to wash our hands entirely or we cannot comply by not washing our hands in the correct manner and by some of those, some or all of those things happening. So to give them a bit more detail as well as the yes/no they did have a code for, why somebody hadn't complied, as in didn't do it at all, or one of these things happened.

[New slide] So these were the results were so kindly shared with me. People were complying 81% of the time in January and March, 80% of the time April to June, but then July to September, it went down to 72%. And when they looked into that, they were having a hospital refurbishment at the time and was probably less access to sinks. So numbers have gone down a little bit.

[New slide] And so what they did was discuss all this, discuss their results and as I say discuss it with the whole team. So everybody was like, okay, what are the barriers? Why aren't you washing your hands there? Is it just that you've forgotten or is there some physical problem? What do we need to do to make this better? And this was after they'd had their slightly lower results. So what they did to remind people, because it's easy to forget, there was hand washing signage at the sink, some hand washing stations and that was to remind people to do it properly. As well as, I mean obviously they're going to the sink so they're going to do it, but to remind them to do it properly and how long you should do it for them.

To have automatic, anything that's a system of work is better isn't it, than having to remember. And so having automatic things is much, much better. So systems of work here are having the elbow taps, the magic eye taps. They're also having automatic soap dispensers, so you don't, the team members don't need to touch taps, they don't need to touch soap pump devices. Again, another system of work, pedal bins, foot operated pedal bins, so nobody has to touch the top of bins, which can be an area where infection really builds up and I'm really, really keen and the whole patient safety and QI initiative is a lot about putting systems of work in place because I say we'll all make human errors. We all forget things. We all do, well I certainly do. But if there's some system of work in place, you're much, much more likely to follow it. And when it's automatic to do it right rather than automatic to do it wrong. They also had more access to Sterilium and antibacterial hand rub.

So the results were already starting to go up October to December as their refurb was finishing and they're doing that on an ongoing basis. So I think that's a lovely, easy hand washing audit that anybody in practice could do. You just pick a day and somebody goes around and checks what people are doing. And then you actually have some evidence to take to the meeting, 'cos if you just start discussing at a practice meeting, okay, let's talk about hand washing, everybody's going to go, yeah, yeah, we do that. We wash our hands properly of course, because we all think we're doing it right. But having some actual evidence, not to blame any individuals, but to say, right, well, only 72% of you are actually washing your hands at the right time, it's a lot more powerful. And then you can get everybody on board and everybody together can decide what you do rather than, it's not a matter of blaming somebody for not doing it, it's a matter of getting the whole team on board to decide what can we do to make it easier for us to do this.

[New slide] And the other thing is client reassurance, isn't it? Now this is a screenshot I took when I went with my husband for an appointment to our local hospital and one of those TVs they have in reception that goes round and round and we had to wait for quite a while. So I did see it go around a few times and I had enough time on the second or third occasion it came round to take a couple of screenshots. So this human hospital was boasting that in the third quarter of 2019 they scored 95% on hand hygiene compliance, which is great. And definitely something to boast about. But wouldn't it be nice if your practice could be reassuring your clients, especially in current circumstances about hand hygiene in your practice. So I think it can be, as well as being very, very important from a clinical point of view, it can be a good point to actually be promoting the practice.

[New slide] So we talk a little bit about ways that we can be sure that the emphasis that the environment is clean and one way is by active surveillance which is doing things like taking swabs and culturing and using things like the ATP monitors, which will look at residue of organic material or marking surfaces with fluorescent markers and then having to do the normal cleaning and then going along with it a UV light Wood's lamp, very handy, just to see whether the fluorescent mark is still there. But I'm not going to go into that in detail because this has been covered in lots of detail by Liz

Branscombe in infection control three. So those of you are interested in active surveillance of the environment, I would recommend if you haven't already watched it to watch our third webinar and, we'll talk about that quite a lot more for you.

[New slide] But what we can also do is passive surveillance. So when we do things like audit surgical site infections or audit the complications of procedures, or monitor antimicrobial use patterns and bacterial culture, we are actually looking at those things which will give us an idea of how our whole practice hygiene is. Because if the practice hygiene is not good, there are going to be more surgical site infections, more complications, and there's going to be more antimicrobial use and we're going to see the bacteria on the culture. So for this section I'm going to talk about one and two and later Tim will talk to us about three and four.

[New slide] So one way to do passive surveillance is to audit postoperative complications of routine neutering procedures. And there is a very good list of how we would do this on the vetAUDIT website, which is on the RCVS Knowledge website. And basically what has to happen is everybody who's looking at doing post-op check-ups, everybody in the practice doing them, has to use the same criteria in order to classify what they see. So this is the criteria on the vetAUDIT website and it's quite simple. But the main thing is before starting this, as with all clinical audit, is to have a meeting, discuss with the team what you're going to do, explain how it's going to happen. Explain that this is not about branding Vet A or Vet B as having more postoperative infections than anybody else. It's about looking at whole practice performance. And it's very, very important that everybody understands this classification, zero to five, because if the information is not put into the right classes, then the information we get out of the audit not going to be useful.

So using this you can say, well group zero ran off, group one absolutely fine, no complications. Group two, it's a little bit pink, oh dear it's a little bit pink but it's fine. We don't need to do anything. Group three Oh dear, we've got an infection or maybe if we've got, say it's very painful, I need to use medical treatment. Group Four, oh dear We're going to have to re-suture the wound because the sutures are out and surgical complication. Group five, Oh dear, we've lost the animal. So that's quite simple, but it is important that everybody in the team knows those groups if they're going to use it. So it's a really easy way for practices to do this passive surveillance to do this audit of post-op complications of routine neutering procedures and a very useful thing to do.

[New slide] So once they've done that, once the practice has done their own audit of post-op complications and got their own figures, then if they wish they can submit them to the national audit for small animal neutering where the practice's own figures can be benchmarked against those figures for other practices. So it's really, really useful because we're all a little bit competitive, aren't we? So we like to think that we're doing just as well as our neighbours, but also it is really useful to look at trends, etc. So this is postoperative complications of routine neutering in cats, dogs and rabbits. Now rabbits have been added and you can look at the results of this on the RCVS Knowledge website. And even more excitingly, there's plans for this to be expanded to include other surgical procedures going forward. So that should be even better.

So looking at the results there, 75% were complication free, that's great. Spays more complications than castrates in cats and dogs. I think that's what we'd expect. But the reverse in rabbits. That's interesting. Cats - fewer complications than dogs. Yeah, cats are very good at healing from anything aren't they? 35 animals died and as a result of neutering, including one rabbit, and then in 25% of the bitch spays, there were some form of complication. And quite a lot were lost to follow up and a lot of those, I'm sure were

cats that ran off and didn't come back for their check-up. So that information could be really useful. When the practice looks at their own results and benchmarks against a national result.

[New slide] So look, this is what a practice that did this, so looking at their results compared to a benchmark. We've got the benchmarks in red for the different ones. So no abnormality 82%, abnormal no treatment 9.5%, abnormal medical treatment 7.5%, surgical treatment 1% and death 0.1%. So this practice had three branches and they were discussing different things about different things at different branches and they wanted to see how they were doing. So they all submitted data to the benchmarking and did own clinical audit in-house. So we can see that they're doing really well with death of animals. That's great. Now just about on the mark, really benchmark with surgical treatment or even a little bit better at some of the branches, but their medical treatment was quite a lot higher. The benchmark, 7.5%, and we'd got the lowest they had is 10.5%, up to 14% at another branch.

So overall the medical treatment was quite a lot higher than the benchmark. So this led this practice to start thinking, I wonder why that is then. So they then started looking for those ones in that group three, to find out what it was that, what the medical treatment was. And they found out in this particular practice that the majority, and the majority by far, the medical treatment was antibiotic. And in some cases it was non-steroidal anti-inflammatory, but it was often antibiotic. So this led them then to look at the practice hygiene, to look at cleaning protocols to look at pre-surgical prep, which again Liz covers in her webinar, to look at all those things and to start thinking what can we change? And then they're going to carry on with not only doing their neuter audit, but carry on with submitting it to the benchmarking to a national audit. So having done this, it's not only shown them what's going on in their own practice, but they can compare it and they can start looking at what they can do and what barriers there might be to improving that.

[New slide] So there's lots of other case examples, loads of them on the RCVS Knowledge website. Have a look at Louise Northway, who is the Knowledge Award Champion, who's had an audit, very, very comprehensive audit of postoperative complications. And she reckoned that assessing, well not what she reckoned what she knew from her results, assessing hygiene and postop care guidelines - that's the other thing, giving owners guidelines of how to look after the animals when they get home, cut complications by half, which is amazing, isn't it? Absolutely amazing. Just doing an audit. And another Knowledge Award Champion, Vale Vets for their hygiene audit by people self assessing and by a questionnaire. And filling in about what they did. So you can do it by observing as the Vets Now one did or by self-assessment. So there's some great case examples there, please have a look. It might inspire you with some ideas to use in your own practice. I hope.

[New slide] And again, client reassurance. Again, same thing, same hospital I took this picture as well, and they were very pleased to say that although using the national benchmark of 5% of patients undergoing surgical procedures develop a surgical site infection, that their results in November, 2019, it was 0.9%. Again, something to definitely crow about and something that you can share with your clients. And I think it also has a useful role in informed consent when clients go, okay, what are the risks? If you can talk about risks but say, you can actually tell them what the risk of post-op complications are in your practice normally and that's the important thing with consent that it is informed and we should be explaining all the risks. I think they're really useful things to do. They can be used very positively.

[New slide] Okay, I'm going to move on to Significant Event Audit now. In human health care they do they have critical incidents where there has been harm to patients and, those are analysed. And they

have M and M (morbidity and mortality meetings, not the sweets), M and M meetings to look at clinical things that go wrong. But in GP practice, what they started to do was look at what they define as significant events, which can be anything thought by anyone in the practice to be significant in the care of patients or the conduct of the practice. So it's not just about anaesthetic deaths or major dispensing errors. It's not just about those things. It's also about things like hygiene and about things like lab samples that don't go off or bodies that go for the wrong cremation or client complaints, all those kind of things. And also positive things, look at positive things too and how well they've gone. So it's a form of clinical audit, but it's a qualitative rather than quantitative form. So there's no numbers involved here. I like this one cause there's no numbers. But it still needs a structured framework. Still need to work through it. And it's looking at one case, one single event from beginning to end and drilling down into it and looking for the root causes and trying to find out exactly what happened and then making some changes.

[New slide] So our significant event audit, sorry, acronym there, our significant event audit is going to be about Barney. Barney had an encounter with a car, unfortunately, and finished up with an orthopaedic procedure which didn't heal properly, had a non-healing wound. It had been going on for a while. So practice thought, okay, we need to swab this. Took a swab. But unfortunately this is where the first of the errors occurred. The swab was never sent to the lab. Time went on they didn't realize the swab hadn't gone to the lab 'cos they didn't have a system for following it, which we talk about in a minute. Never realized it hadn't gone. Eventually they swabbed again and when that came back it was MRSP. And over the next few weeks, there were more cases of MRSP in the practice and Barney had been admitted to the practice because he wouldn't leave the wound alone. He couldn't keep any dressings on it at home. So he was admitted to the practice. And after this, over the next few weeks, there were more cases of MRSP in animals that had been inpatients, in the practice. So this is definitely a very, very significant event and a perfect thing to look at with a significant event review.

[New slide] So the thing with significant event audits is to gather information and the team to discuss in a meeting. Now again, I can't stress enough, this is the whole team, whole team to discuss it. Not just the vets, not just the nurse. Vets and the nurses, everybody. The reception team, the practice manager, everybody. And the important thing with that meeting is that it should be quite clear to everybody, but it's to improve systems, not to blame individuals because if we don't have that open, fair, honest culture going on, people are going to be worried about saying anything. So it's got to be to look at systems, not to be putting the blame onto somebody for what they did or didn't do. As I said before, systems of work are the really important thing. So this meeting should be open, it's good to have somebody to coordinate the meeting and to make sure that it stays on those lines and to draw it back if people do start going down other lines. And it's not to apportion blame, but it is to encourage reflection. It is to encourage improvement.

[New slide] So this is what happened. And so the first thing to find out is what happened. And that's by collecting together all the evidence by the accounts of people, things like consent forms, hospitalization sheets, anaesthetic charts, if that's appropriate, any lab results. Collect all those things together and then have all those bits of information. Then have all the accounts of the people involved and then look at, okay, what did really happen here? So what really happened here was that the first swab that was taken from Barney, before he was admitted was not labelled and it was left in the fridge and nobody noticed it was there not labelled. It wasn't recorded in the lab book that it had been taken. So nobody even realized it not being sent off until Barney's owners said, what about that swab result? And the vet was like, Oh, I can't find it on the records let's have a look, Oh, everybody's running around like headless



chickens as usual. And then they found that actually the swab was still in the fridge. So that's when they took another swab.

Barney, as I say, had been kept at home because at home he kept, even with the Buster collar on, he was ripping the dressings off, managing to get the buster collar off, get the dressings off, the wound was very unpleasant and a big source of infection. So it needed to be covered. So he was admitted. Because the first swab hadn't gone and before the results were received for the second swab, all the team and the practice weren't ready, didn't know what was going on with Barney. It was really, really busy and usually with these things that go wrong, practice are really busy and perhaps that was part of the thing and he was moved between at least three different kennels in the ward areas. Even when the results did come, nobody actually communicated it to the kennel assistants for another 24 hours. So he didn't get labelled as needing isolation or hygiene precautions to start with. Eventually he was moved to isolation once everybody realized what was going on. But then when they said, okay, well, where was Barney when he was in here then? And various people said, Oh, I remember he was in the end kennel. And then somebody said, well, I thought he was in this one. And so nobody knew exactly which kennels Barney had been in, when they started to look at it.

[New slide] So looking at why did it happen then that's the next thing. You found out what happened. So at the meeting you think well why did this happen? So this is root cause analysis. Actually looking at root cause analysis is really good because, I think it's really good anyway, because you just, you don't accept the first thing that you think is the cause, you keep going Why, why. To me it's a bit like returning to being a toddler and just going why all the time? So why did happen? Well obviously the communication wasn't very good between the vets and the team who were looking after Barney in the kennels. They didn't label him for isolation, but really looking at that was because they had not got the lab results, they hadn't got the lab results cause the first sample didn't go off. They didn't have a lab tracking system.

That was a really big thing here. If they had a lab tracking system that followed a lab sample from when it was taken to when it went to the lab to when you got the results to when the owner, the vet was told the results were there to when the owner was informed that the results were there, then they would have seen that the first, somebody would just noticed that that first sample didn't go. So a lab tracking system was definitely not there.

They also didn't know where Barney had been in the practice once he was admitted so they didn't have a kennel log. And I think that's really useful thing for practices to have to know exactly which cage an animals been in so that they can follow up on any hygiene issues. They didn't have any protocols for MRSP cases for handling, how we would move them around the practice, how they would nurse them.

And again, I can recommend webinar three for that because Liz Branscombe covered that in detail about moving infected cases around the practice and protocols for handling. So please watch that one. The other thing she covered was having somebody in the practice responsible for infection control and for training the team in infection control. And that person is often the person who is also responsible for auditing infection control. But this practice didn't have everyone, anyone. They did have a biosecurity policy because they're in practice standards. We have to have a biosecurity policy, but they hadn't updated it. And most team members when asked about it, didn't know where it was even, let alone what was in it. So they had it, but it wasn't really a living document and it wasn't a system of work.

[New slide] So this significant event audit, it might lead to what you need to do. Now this is where we have to be careful. As I said before, it's about addressing those systems and not blaming individuals, and

we're trying to make sure that any negative outcomes are less likely to recur. We can never get rid of errors, and there will always be human errors, but improving systems means that they're less likely to recur. So there's a few themes usually that come from significant event audits. They might lead to realizing that you need some training and CPD and I think in this practice that would be the case. They might lead to writing new guidelines or protocols or changing their existing guidelines or protocols because they're either not used or are not appropriate and they might lead to doing some other audits, maybe some outcome audits.

[New slide] So in this practice they looked at them, what did they change? Well, basically they got a person to be in charge of infection control. They updated their biosecurity policy and updated all the cleaning protocols and then made sure everybody actually knew about them, had the team training, 'cos no point having bits of paper that say what you're going to do if it's not what you actually going to do.

And that's the important thing. So team training and also team inputted into those updates on the protocols and the biosecurity policy because again, it's no point somebody on high writing it. It has got to have input from the people who are actually doing it. They did start to have a kennel log, so they knew where animals had been. They also started a lab tracking system, a lab log so that they did know exactly when samples arrived and this is useful for so many other things as well as infection control cause samples going astray can be a real problem. They started auditing cleaning schedules, how they were auditing the checklists. They started, an audit of routine neutering to do some surveillance that way. They started looking at the culture and sensitivity of all samples sent away by the practice. Looking at when they got results on antimicrobial resistance and started looking at practice antibiotic prescribing policy.

So I think overall, this incident, which was to have been very negative at the time, led to an awful lot of good positive changes, which I'm sure improved biosecurity in the practice and made everybody in the practice feel better about infection control.

[New slide] So I'd really recommend that to anyone who's, you know, has these kinds of instance to use them positively. So I'm now going to hand over to Tim again who's going to talk to us a bit more about passive surveillance.

### **Tim Nuttall**

Thank you, Pam. Thank you for that incredibly useful, thorough and inspiring oversight about how to use audit and benchmarking in practice. And the clinical examples were fabulous. It's often easy sometimes to dismiss these things as sort of theoretical concepts that come out of people that live in ivory towers with no clinical experience and time on their hands. And I think showing how these things can be directly clinically relevant to improve the practice experience for the staff that work there, the patients that they care for and their owners is incredibly useful and inspiring. What I'm going to do just to finish up this presentation is look at some brief examples of how these techniques can be used to look at monitoring antimicrobial infections and antimicrobial use patterns. And this very much follows on from Barney's case.

[New slide] So again, I'm just going to start off with a clinical example. This was something that occurred in the hospital that I work in. And what we have is a clinical audit team. And this is quite a large team, but we're a big referral teaching hospital. And one of the jobs that I have on that team is to review the antimicrobial resistant and unusual infections. And in that group I work with our clinical microbiologist and our lab team as well. And you can do this quite easily in practice. So again, it depends on the

frequency of your samples, how many coming through every month whether an individual does this or team does this, whether you review all the cultures that are coming back or whether you flag alerts. Now what we tend to do simply because of the sheer volume of cultures that are coming in and out of the hospitals is we have an immediate alert system. And what we've done here is anything that's multidrug resistant. So anything that's an antibiotic resistant organism and then any other unusual organisms of interest. So these are organisms that have been flagged as important in hospital or health care acquired infections which are known as nosocomial infections, or are emerging organisms of interest because of zoonotic potential or something like that. And in the second webinar, so part two of this series, I went through a whole series of different bacteria mainly, but also looked briefly at fungi and viruses and protozoa as well. And again, you can have a look at that webinar, look at your practice type of work that you do and select your sort of organisms of interest.

So coming back to this example. So we do have this immediate flag and we review all of the alert cases as they come in because there might be something that needs immediate attention. And this is where we can immediately flag and check that treatment, barrier control, precautions, zoonotic advice for an owner or so on is being immediately implemented. And then at a level up from that, we take a monthly look back and that allows us to spot any emerging trends very rapidly. So in this example we picked up, we'd seen five *Burkholderia cepacia* infections in one month. This is quite an unusual bacteria. It's related to *Pseudomonas*. It's quite widespread in water sources and sources of stagnant water and things like that. And it's generally an environmental organism, but it could also be an opportunistic pathogen and it can cause quite serious infections but it's not a particularly common infection. So this was an immediate cause of interest.

So what we did is looked at the five cases in detail, going back through their clinical records. And very quickly it became apparent that they had all undergone bronchoscopy within a very close time period. So that allowed us to home our investigation, if you will, and check into the bronchoscopy area. And to cut a long story short, we took a whole load of samples from there and discovered the culture in the flexible bronchoscope. So the next thing we did which was obviously suspended all use of that. And again, obviously this is going to have a clinical impact. So at this point we want to be moving fairly quickly by working as a team. So this is where we had clinicians involved. We had the infection control team. We had some epidemiology expertise as well. And then obviously we had the clinical microbiologist in there.

And again, cut a long story short, we reviewed all the procedures and this seemed to have shown that the correct procedures are being followed. So it wasn't that somebody was skipping cleaning steps or anything like that. So we then looked at the automated cleaning machine and we cultured the same bacteria from that. And then by running diagnostics on the machine, we discovered that it actually had a fault in its cleaning cycle, in that it wasn't maintaining temperature. And that had allowed the bacteria to establish in the water bath and that was immediately cleared up. And so within a week, we'd gone from identifying the problem to discovering the cause, correcting that and then back onto our passive surveillance again. So that was just a very good clinical example of how this passive surveillance can alert you to take active measures in practice.

[New slide] So this is another thing we do. So as I said, we have that sort of immediate flag for the very serious organisms. And this is to try and avoid any serious events further down the line. We then have the monthly review which allows us to respond very quickly to any emerging trends or problems that we see. We then have a quarterly review, which is where we go back and look to see whether we've got any slightly longer term trends, issues or repetitive things that are happening, that we can then raise

through the equivalent of our significant event reporting system or a clinical audit system to feedback. So this could be just examples. It could be that we noticed that dogs with MRSP weren't being labelled as such in the hospital, so there wasn't any visual reminder on the kennel, or the appropriate advice sheets not going out to the owners that cultures weren't taken when they should have been taken. So we can immediately feed back and look at ways to improve our performance on that. And then we also do an annual review and this gives us an overview, but then also a backwards view to see how we're doing on a year to year basis. Are there things that we're doing well or are there trends emerging that we need to be concerned about?

So this is just some data that I've put together. So this is the number of our antimicrobial resistant isolate. So the bacteria that we isolated, and you could see that we were pretty static in 2015 and '16, and then we saw this jump in 2017 and then we've plateaued off a bit in 2018 and '19. Now, one of the problems here is that, that that gives you the overall figure, but what's more important is how this relates to percentage of cases because raw data like that can disguise the fine detail.

[New slide] So in the next slide what I've done is corrected the data in terms of the percentage of cultures that were taken. So because you could have argued 2017, we saw this big jump because we were seeing more cases. And if you actually think about that in terms of the number we're culturing, we were a lot busier, but we also did see an absolute increase in our antimicrobial resistant isolates. So again, 2015 and 16, we were pretty stable, so it was big jump in 2017 and that's where we really started looking at, tidying up our infection control rules, looking at our training, looking at our auditing. Partly because at this stage we'd seen a big increase in number of cases we were seeing and consequently the number of staff that we have in the hospital as well. So it was time to have a look at that because things can easily get lost in the woodwork.

And since then, what we've seen is a gradual decline. So 2018 and then it's 2019, we've seen it, we've seen this drop in the organisms in percentage terms. And this is despite the hospital actually getting busier in 2018 and in 2019. And we could also have a look at where our infections are, and this can tell us, the frequency we're finding organisms in different sites, species or activities, which can tell us where we need to concentrate our monitoring, training, and other activities. And you can see from this, I won't go into this in detail, but you can see that something like just over three quarters of our cases are associated with urinary tract infections, wound infections (and those could be surgical or well both surgical and traumatic), and skin and ear infections with everything else making out less than a quarter of our cases. So that's where we tend to see things. So for examples we would be tending to culture these at admission or a lot sooner. We would target the cultures. We would also treat anything suspicious as though it's antimicrobial resistant until proven otherwise, change some of our handling procedures because we know that the odds there, we've increased the odds in terms of these cases.

And then knowing what we've got. So what bacteria are there in here, it could also be useful because this can look at our treatment procedures and also our disinfection procedures as well. We can look at zoonotic risk, we can look at routes of transmission and again, target effective control measures on there. So just looking at this group, you can see that the methicillin resistant staphylococci, so that's MRSA, MRSP and then we've got some Staph schleiferi, some coagulase negative Staphs as well, that's the MRSE, makeup something like about a third of our organisms. But what we're seeing is, we've seen an increase in the number of our antimicrobial resistant gram-negative organisms. So those are the ESBLs, which is the extended-spectrum beta-lactamase producers and the AmpC producers and the little other group that are other organisms of interest, Morganella for example is an emerging nosocomial pathogen.

So if you remember back a couple of slides ago, I said that we'd seen quite a substantial decrease in the percentage, in terms of our caseload, in the percentage of antimicrobial resistant infections. And I haven't shown you all the data, but hidden within that data was we've seen a very substantial drop in the number of methicillin-resistant Staphylococcus, we're seeing predominantly MRSA and MRSP. And that has also been seen in human hospitals. And this is because we're often concentrating on better handling of patients, better hygiene, better hand washing and better surface disinfection.

[New slide] But what this graph indicated, is that we'd actually seen a relative increase in these antimicrobial resistant gram negative bacteria. And when I looked at the absolute numbers disguised within our overall drop here was an absolute increase in both the AmpC producing gram negatives and the ESBL producing gram-negatives. And these are gut born bacteria and controlling them is a little bit different and in some ways it can be a little bit more challenging than the more surface born staphylococcal bacteria. And again, this trend towards these gram-negative organisms is something that's being seen in human medicine. And although our numbers aren't huge at the moment it is something very much we're keeping an eye on and beginning to review our animal handling and infection control procedures to take these gram-negative bacteria into account. And one of the important drivers for the increase in resistance among these gut bacteria is antimicrobial use. And hand in hand with clinical audit and monitoring of antimicrobial resistant bacteria must go monitoring of antimicrobial use and antimicrobial stewardship because at the end of the day, to use that terrible cliché, the most important way to control these bacteria is not to have them in the first place.

And this means using fewer systemic antibiotics and only using them where necessary. And trending towards the most first tier, the lowest tier, most narrow spectrum drugs that we can wherever possible. And that means again, you have to know how the practice is doing in terms of antimicrobial use. And now the next slide, this is just an illustration of how you can start to do this.

[New slide] Now you can do it through your own records. It's just for a lot of practices, that's actually quite difficult because abstracting the data about use of individual antibiotics and treatment courses can be time consuming and difficult to analyse. And again, it depends a bit on your practice software and the sales data, which is the easiest way to do it, tends to give a very crude picture because it'll tell you how much antibiotic you're using.

But it really, what's more important is how that is being used and who it's being used in. So it's the courses of treatment that are more important than the simple headline overall use figures, although they can give a crude estimate. One way that a practice can be helped with this is by engaging with the mySAVSnet AMR programme. And this is run by the SAVSnet group who run out of the University of Liverpool, initially supported by BSAVA, and they work by interrogating practice software systems and SAVSnet does a whole ton of stuff where they can look at almost anything you do, and abstract data on that which has been incredibly useful in looking at big data projects in all sorts of angles of animal health and veterinary practice. And they do this by inserting what in effect is a virus, although I know they don't like to use that term because it has negative connotations onto your practice software. And then that can be activated to abstract data and then also prompt some data inputs as well.

And the way the mySAVSnet AMR works is by looking at antimicrobial use. And then what they do is provide information like this, which allows you to benchmark the practice use of antimicrobials against all of the other practices that are involved in the system. And as Pam showed with the surgical site complication data, then that can be a little bit of a prompt to say are we doing okay compared to the others? Are we better? Which is great, but you know, don't become complacent, look at what you're

doing well and keep doing it. Or is the use creeping up in relative terms, at which point that will be a prompt to say let's have a look at our procedures. Is there something we can do differently? Is there something that we can do better to encourage better stewardship.

[New slide] So I would just personally like to thank Pam for her presentation, which as I said was it was excellent, thorough and inspiring. And I said clinical audit tends to be the forgotten cousin really of infection control, cause it can often seem like hard work, it can seem difficult to organize and implement. And I think Pam has shown the tools that can be used to help you do this and how it really is an integral part in effective infection control programmes. And I'd also like to thank RCVS Knowledge for supporting this programme, for supporting the quality improvement programmes and infection control and other aspects of a veterinary practice. And for organising this series of seminars, I say there's five now in the series, which will all be available on the website and could be very, very useful for training. If you have any questions, the email is there to get in touch with us and we'll do our best to answer them as quickly as we can. Thank you again.

### **Pam Mosedale**

Thank you, Tim for your contribution there. That was really, really interesting. I mean, it's such an important subject, isn't it, antimicrobial resistance? So thank you, that was brilliant. And thank you from all of us to Amelia at RCVS Knowledge for actually being the technical person behind all these webinars. Thank you, Amelia.

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