THE KNOWLEDGE SESSIONS:

Saving lives: the value of checklists in clinical practice

Podcast transcript, February 2020

Lara Carim (LC): Hello and welcome to this podcast from RCVS Knowledge, whose mission is to advance the quality of veterinary care for the benefit of animals, the public and society. I'm Lara Carim and today I'm delighted to have with me Amanda Boag, Vice-President of the Royal College of Veterinary Surgeons, for this discussion on saving lives: the use and value of checklists in clinical practice.

In addition to her presidential role, Amanda is Clinical Director at Vets Now, where she has worked since 2008 overseeing clinical and professional standards. Prior to that she was a lecturer in emergency and critical care at the Royal Veterinary College for five years, where she was heavily involved with running both the referral and first-opinion emergency service, as well as teaching on veterinary undergraduate, postgraduate and veterinary nursing programmes.

Amanda was President of the European Society of Veterinary Emergency and Critical Care from 2011 to 2014, and for the following four years she was both the founding Trustee of the British College of Veterinary Specialists and Founding President of the European College of Veterinary Emergency and Critical Care. Amanda, thank you for joining me today.

Amanda Boag (AB): Thank you for having me.

LC: So, to kick off our discussion, could you provide some background on checklists for people new to the concept? How do checklists come about and how have they evolved?

AB: So checklists are a topic I feel passionate about in terms of the improvements in patients' care that they can potentially bring. They're relatively new in veterinary medicine, but they have a long history in other industries. So they probably started actually after the very terrible incidents in Chernobyl, which some of the older listeners may remember. Some of our newest graduates may not remember it, but this was when a nuclear reactor exploded in the old USSR back in the 80s. And at that time there was a lot of work to try and understand why. And the real concept of a safety culture started to be introduced in terms of making sure that when you were working in industries where safety was critical, having a series of checklists and points that were checked regularly to prevent disasters happening was important.

And that led to the development of this safety culture concept, which started, as we said, in the nuclear industry, but then moved very much into aviation. And we've learned a lot from what the aviation industry has learned in terms of preventing airline crashes. And then more recently it's moved over; our human medical colleagues picked up on it as a concept really in the late 1990s and now really the last sort of five years probably, but with increasing rapidity, the veterinary profession is also embracing it, and with good reason – we work in a very complex environment, there's lots of things that have potential to go wrong, our brains are very busy with thinking through clinical knowledge; it's easy to forget. Not for any malign reason, but just to forget.

LC: There are many stakeholders, it seems to me, who can benefit from checklists. Why are they so valuable in the industry?

AB: Well I think you're absolutely right, I think all of the potential stakeholders or people involved with taking care of animals it's a benefit to. So I think that stems from the fact that we recognise that the clinical environment we work in is very complex and there's lots of potential for errors to occur. And again in human medicine, there's been a lot of work done categorising those errors. And they're actually listed on one of the slides that accompanies this podcast, so you can go in and review these if you like, but there's things, you know, challenges with diagnosis. So, is a diagnosis made too late? Is a certain test forgotten? There's errors with treatment – so technical errors, but errors with drug calculations, errors with timing of doses, so delays in doses.

In the broader sense there can be errors with providing preventative care. And then there's other errors as well in terms of the whole team that we work with, so failures of communication, failures of equipment, et cetera. So in our really complicated environments, there are a huge number of errors and nobody, no veterinary professional, whether vet or nurse, goes into work in the morning thinking, 'I want to make a mistake', they just don't.

And yet mistakes do happen. And that is a product of, as I said, that really complicated environment that we work in. And when mistakes do happen, that has a huge impact on the healthcare professional as well. So the veterinary surgeon or veterinary nurse, or it's often multiple people who were involved with the lead-up to an error. So that can have a huge impact on the wellbeing of the veterinary professionals as well.

So again, checklists can help reduce that impact because it makes errors less likely. Clearly the animals themselves, we want to be providing the best possible patient care to them. And again, errors with drug dosing or forgetting things can have an impact.

And then obviously we have that triangle. It's different to human healthcare with the owners of the animals as well, where we are. Then you obviously care very much about their pet and we want to be able to reassure them that we're doing everything possible to make sure their pet gets the best possible care. So the use of checklists can have a very positive impact across the whole veterinary team for the patients and for their owners.

LC: So what can we learn from human healthcare's use of checklists, both in terms of positive outcomes, and potentially less successful approaches?

AB: Yeah, that's a great question. So I think there's a lot we can learn from human healthcare and they obviously have bigger and more evolved systems, and I think we can learn a lot both about the value of checklists but also how to introduce them, so that they become something that is seen as a positive thing by the healthcare professionals, rather than as just another sort of tick-box exercise.

So the move in human medicine really came about in the late nineties. There was a study put out by the Institute of Medicine in 1999 called 'To err is human', and it started talking about the fact that errors are really a product of the system; that it's not individual healthcare professionals who are deliberately making errors – it's a product of that system and environment they're working in. And one of the quotes (it's on one of the slides that accompanies this presentation) really brings home the importance of systems: "Errors can be prevented by designing systems that make it hard for people to do the wrong thing and easy for people to do the right thing. For example, cars are designed so that drivers cannot start them while in reverse because it prevents accidents." And that just makes so much sense, doesn't it? I mean, most of us drive cars. And of course if you *could* start accidentally in reverse, I suspect there would be more people having unfortunate incidents. And so, it just shows that when we put thought into the whole system to make errors less likely, that can have a really huge, huge benefit.

There's better data. We're starting to collect data in the veterinary industry now on the number of errors. There are a number of the larger veterinary groups, but also RCVS Knowledge, the VetSafe system through the VDS, that are starting to actually collect some data actually relevant to our profession.

But I think we can probably rest assured that it's not going to be that dissimilar to medicine. And certainly in human medicine, there was a big study in the States (the Harvard Medical Practice study) that showed that 4% of hospitalised patients suffered significant adverse events and 30% of these are due to what's classified as human error, although, as I've said, it's going to be humans being put in a position where they make mistakes by accident rather than deliberately.

And in the UK, there's an NHS study that showed that around 10% of patients admitted to the NHS experience a patient safety incident, and up to half of those could be prevented. And in any year, 72,000 incidents may contribute to the death of the patient. So we're talking about a big problem here, and I think that our goal – and checklists is only part of it – but one of the real benefits of checklists is starting to try to reduce those numbers.

So what can we learn? Well, from the human side, I think that one of the first checklists that was introduced in the human medical world was relating to surgery: the patient surgery safety checklist, which came about as part of a project from the World Health Organization. Some of you listening may have heard of one of my heroes Atul Gawande, and if any of you haven't read his books – or actually he did the Reith Lectures for Radio 4 a few years ago and they're absolutely wonderful to listen to. So he was one of the most, I guess, public faces of that project. Although as with anything, there were large teams involved and they started to develop a surgical safety checklist that aimed to reduce morbidity and mortality.

And they trialled it in a number of hospitals around the world, so a number of different healthcare environments, and I wouldn't be 100% confident about this, but my understanding is it's the single intervention that's had the biggest impact on surgical mortality since the development of asepsis – so that shows the scale of what we can achieve. So there's a *New England Journal of Medicine* article published in 2009 which showed that the death rate was 1.5% pre-checklist, and just 0.8% following checklist introduction. And with 234 million human operations a year, that equates to over a million and a half lives saved. And just from simply checking a bit of paper, making sure everyone knows who's who in the room, what procedure they're doing, have they thought through potential complications that might happen and are they prepared for them?

The checklists, they're not particularly complicated, but just having everyone prepared and having people think through and make sure of the scenario plan for things that can go wrong, clearly does have a big impact then on outcome, which is great.

I think one of the other things you asked about was some of the problems, was that they've also done a lot of work obviously looking at how checklists are implemented. And I think that's where we can learn a lot as well; I think as veterinary professionals we are trained to be autonomous in our decision-making and so it's absolutely crucial that we do understand physiology, anatomy, pharmacology, etc., and that in any one patient we're using all of our critical faculties to think about what's best for that patient. So there can be a resistance.

And I think it's the same in the medical profession; a resistance to introducing something that's seen as being administrative or too simple, or somehow interfering with that clinical autonomy. And so it really is about winning hearts and minds round with that sense that it's not about trying to take anyone's clinical decision-making away; it's actually about freeing your brain up from doing some of those more mundane tasks so that you can actually use it for those decisions and thought processes that really do require higher level thinking. But they've done some nice studies looking at the introduction of checklist into human hospitals

and, finding that there are always going to be, as with any new thing, some people who are very strong advocates, a lot of people sitting passively in the middle, and then a few people who are deeply hostile.

But there was a woman, and I can't remember the exact numbers, but there was one study that Atul Gawande quotes a lot, where they asked a bunch of human surgeons how many of them were happy or content to use checklists, and I can't remember what the figure was, but you know, 60–70%, something like that. And then they asked if it was their child being operated on, how many of them would want the surgeon operating on their child to use a checklist, and it was pretty much 100%. I think it is about as we in the veterinary profession look to ways of improving our systems rather than just our individual clinician knowledge and skills, really having those conversations, making sure people understand this really is about providing the best possible patient care. It's not about trying to take anyone's autonomy away or adding an extra administrative burden. There's a really powerful case for improvements in patient care that are made.

LC: Absolutely, and I think it's really interesting you talk about the kind of liberating potential of using checklists to free your mind, to focus on perhaps other more involved, complex questions in a treatment scenario. And I'm wondering whether some of that scepticism, I'd be interested to know your view, might be due to some bad press that checklists have had sometimes in other industries. In social care we've heard about scandals a few years back where reportedly an over-reliance on checklists might have been a contributing factor to some difficult childcare situations, where potentially the professionals involved were heavily focusing on the tick-box exercise potentially, rather than looking back. And of course this is something in the press, it might well be magnified, but I wonder whether that is part of the scepticism, and it's interesting to hear your view that in fact they're liberating rather than constraining.

AB: Yeah, totally. I don't know where the resistance comes from; you're right, it may come from that sense that if we as professionals just become rule followers then considering the complex nature of the situations we deal with, of course a set of rules can never account for everything. So I think you're right. That might be part of the resistance, that sort of feeling that we understand the complexity of what we see and that if there's a perception that checklists are taking it back to 'you have to do X, Y and Z', then that could be to the detriment of care.

I think there is also just that sense that it is the system and we are trained largely as individuals. And again, there's interesting work about the importance of teamwork training in healthcare environments and actually how that's really, again, in in its infancy. I think we're taught very much as individuals, and of course as individual professionals, we have to be responsible and accountable for our decisions, but probably how we fit into that wider framework is probably not emphasised enough I think.

And again that might be part of it that, that checklists are about that wider framework and not about you as a person. Because if you say to any individual vet: "Would you" – I'm just thinking of a very simple example – "Would you, if you're doing surgery, would you take the wrong leg off?" "Of course I wouldn't." And yet it happens. So again, it's about trying to recognise that we as individuals of course know that you wouldn't take the wrong leg off or you wouldn't give a 10 times overdose or whatever. But actually when we put us in that environment, those kinds of things happen and it's not your fault. I think people sometimes think it would never happen to them, but it can happen to any of us.

And recognising those systems, as you mentioned in the intro, my background is very much and my clinical specialty is emergency and critical care. And we know that the emergency

environment is particularly prone to errors because of a number of different factors, in terms of the facts that the caseload isn't spread evenly through the day; there's real peaks and troughs of caseload activity; it often involves working out of hours – and we all know that even if all your work is out of hours, our human brains are not designed to be at their most alert at 4am. So there's a lot of different factors that impact on the environment and make it more likely that errors can occur.

There's also, this is so true from my own experience on the clinic floor, in a busy emergency environment you are constantly getting distracted. So you might be halfway through a task with a patient, you know, writing up a kennel sheet or even just thinking about a patient. And someone will approach you, maybe a nurse, to say that one of the dogs in the kennels has vomited, and at the same time a receptionist is calling you to say that they've got a phone call about an animal with problem Y. So you are constantly being distracted and that makes it very, very easy to miss stuff. It happens outside the clinical world. I know as a mother of two children, I couldn't get both kids out of the door in the morning with the right school things unless I had a checklist essentially [laughs]. So it's just that process of having a system to help you make sure that you don't make mistakes and, you know, take the wrong leg off or forget a key bit of school equipment; it's very much the same concept.

LC: It's relevant to the human condition.

AB: Absolutely, absolutely. And I think all the research that's going on about how our brains work is really, really interesting. And particularly I think to the point we made earlier that by using checklists, what you're doing, is you're taking away a lot of that mundane stuff that actually you know, you don't want to have to be thinking about, so that your brain can focus on the higher cognitive tasks. So, yeah, I think it has analogies across many areas of life.

LC: Indeed, indeed. We talked a little bit earlier about data – gathering data, and the appetite for data. I'm interested in how we ensure checklists used by different teams and indeed different practices meet a similar standard and are based on the same or equivalent evidence. Do you have thoughts in that area?

AB: [Laughs] That's a really good question. So I think there is a purist view of checklists. So when used in their purest sense, they only contain critical steps and common areas of error. Now in the veterinary industry, we probably don't have the data for sure. I mean, we have a wealth of experience and there's anecdote, but we don't necessarily have the data. Having said that, things like the surgical safety checklist, where we've adapted the human one for veterinary use, is based on the data that's been collected. The human healthcare system is just more evolved; they're larger and it's easier to collect those big datasets.

So typically, a purist checklist is when there's just critical steps. As you said, it's based on common areas of error. It's not a kind of a recipe to follow; it is a list of really crucial things usually, typically, grouped by defined time periods. So, you know, during surgery, after surgery, et cetera, and then that confirmation that the action has been completed, either verbally or by a tick. Now certain procedures like doing surgery, there are aspects of that that are very suitable for that very defined checklist. And that's probably more similar to what's used in the aviation industry where, you know, before a plane takes off, and I'm on a plane lots at the moment so I'm very grateful that I know that when any of the planes that I'm on take off, the pilots have gone through a 'Is this bit working, is this bit working?'– all the critical steps before they take off.

I think in the veterinary world it's going to be interesting to see how they evolve, because actually the number of processes we have where there is that data to back it up – but also that we have those really critical safety steps – is probably a bit more limited, because unlike human healthcare (where you can come up with in a particular healthcare system, this is the

best way to treat problem X), in the veterinary profession, we're obviously, we're essentially private healthcare providers. So not only are we juggling what's best clinically for the animal, we have to bring in what the owner both wants emotionally – and that's going to be very different in terms of the level of intervention they want for their pets – but also financially what they can afford. So it's one of the interesting discussions that I have internally with the Vets Now team as we're developing more checklists, and we've also had with some of our colleagues at the VDS in terms of, what actually is a checklist for the veterinary industry? Do we need a different word?

But I think the bottom line is, there are some checklists like the surgical one that probably are based on good – albeit translatable – data, and are true checklists. And then there's other scenarios. So for example, we've developed a checklist, and I'm using that word advisedly now, for Caesarean sections. So suggesting when an animal comes in and you're considering a scenario, have you thought about all the different options in terms of imaging the animal, checking blood work, et cetera? But we're not saying you have to do it, because we know that for certain clients that's not possible. It's more about that aide memoire to say, have you thought about doing this? And if you're not doing it, have you actively made the decision not to do it for justifiable reasons or considerations?

LC: So prompts for considerations.

AB: Exactly, exactly. So I think it's going to be very interesting as the veterinary profession evolves this cultural focus on systems as opposed to purely individual knowledge, that some things will be suitable for checklists, like surgical safety, probably some others like maybe blood transfusions, setting up drug concentrate infusions, et cetera, there may be situations where a checklist is the right thing to do.

And in the purest sense there may be other situations where we need a sort of a guidance checklist, the checklist approach, that systems-based approach to making sure due consideration has been given to everything – but not necessarily a checklist in the pure sense of the word, where it's critical safety steps that have to be done before something happens.

LC: Yes, yes. And in terms of less the data, but the uniformity of checklists. I mean, obviously at RCVS Knowledge, part of what we're doing is encouraging people to provide us with their checklist so that different practices, people working in different roles across the industry can look at them, hopefully find them useful, and think, well, do we need to tweak it for this situation? So I suppose there's a question of how do we, beyond the website and various channels that come from us, how do we encourage that sharing of checklists? And how important is it that they need to be 100% uniform?

AB: Yeah, no, it's a good question. So I think considering the variety of environments we work in within the veterinary profession, I don't think it's possible for them to be 100% uniform. So I think RCVS Knowledge is a great example of an organisation that covers the whole profession, and can be used as a vehicle for people to sort of share best practice and learn from each other.

Within the environment I work in with Vets Now, we actually do have two slightly different surgical safety checklists: one for our out-of-hours environments and one for our 24/7 referral hospitals, because they are very different environments: the team sizes are different, some of the technical facilities are different. So to try and apply the checklist in the wrong environment is, is to be fair…It's not hugely different, but again, it's really important as we introduce checklists that they are seen as being useful to the team.

So if you're trying to use a checklist for, as I said, a very large referral hospital environment and put it into a much smaller team environment, you can run the risk of alienating the team. Because they say, well, you know, I don't have one of these tests, that's irrelevant to me, and then you've lost the confidence of those people that the checklist is useful, because it seems not relevant to their environment.

So actually I think there isn't probably 100%. I think we shouldn't aim for uniformity, it's not desirable. There's probably some key principles and I think the more we can share and think, 'Oh that looks like a good idea what that practice does', the better. But actually I think they genuinely do need to be adapted for the different physical and team environments that we see across the whole profession, because it is hugely variable.

LC: And that plays to a question I had about advocating the use of checklists. Obviously there's a sense of ownership and the relevance that's important. Are there particular practices that you're aware of, or practical means that in your own experience or that peers have introduced that have borne fruit in terms of reminding people about the benefit of checklists in daily practice or in winning over some hearts and minds?

AB: I think, as with everything, it's about communication, and communication in a positive way, that when they're introduced, it's about getting the whole team involved. It's not about 'You have to now complete another bit of paperwork every time you do surgery'. It's about sitting the team down and going through some of the stuff we've talked about today – so, explaining the benefit and giving real examples of where mistakes have happened. You know, swabs *have* been left behind in a dog's abdomen, and trying to make them real.

And actually, the more senior people we can get to speak up about the mistakes they've made; because I think that is the one thing, as I said, intellectually, everybody knows that they wouldn't take, they wouldn't deliberately take the wrong leg off or they wouldn't deliberately leave the swab behind. So I think that 'Of course I know, I know that shouldn't happen so it won't happen to me'. And actually the more that we can have people speaking out saying, 'Well, you know what, it *did* happen to me', and it *does* happen and it's not deliberate and it's…you feel awful when it happens, but actually these are the things that we can put in place, or the use of checklists will really help reduce the risk of that.

So I know that within Vets Now, I've been there 10 years now and we've had, I can't tell you exact numbers, but over the years we've had the odd situation where something has been left behind in a dog. Since we introduced the surgical safety checklist, there hasn't been a single incident in patients where the checklist has been used.

LC: So it's a resounding endorsement.

AB: Yeah, yeah. So I think it's about spreading that word, being honest about the fact that mistakes do happen, and seeing this as a positive way to reduce that, rather than as a sort of administrative headache.

LC: So Amanda, we've talked a lot now about surgical safety checklists in humans. Are you aware of any published literature relating to surgical safety checklists?

AB: So obviously there's a lot in the human field as I said, and anecdotally within Vets Now we've seen a reduction in incidents. There's been one paper that I'm aware of from Sweden actually, looking at 520 animals that had a surgery safety checklist used or not used. And they found their data actually backed up that presumption that it's going to be transferable; the benefit's going to be transferable over to the veterinary field, and they found they had significantly more complications in the animals that didn't have a checklist used than that did.

So it is early days, and as we all know in the veterinary profession, collecting evidence can be a challenge, but it is starting to come through, and I would be very surprised if the strength of the evidence isn't added to over the coming years.

LC: You've talked a lot about the surgical safety checklist. Are you aware of any other checklists in use at the moment in the veterinary world?

AB: Yeah, so, good question. They're starting to, one of the other areas that is being looked at and where we do have one paper is looking at the approach to animals being admitted to an emergency room with septic peritonitis. So this is a paper out of the US and we all know that when an animal has septic peritonitis, not only do they need surgery, but also timely use of antimicrobials is important. So this was a checklist used for animals that had suspected septic peritonitis as they came into the emergency room, and then looking at the time taken to start to get those antibiotics on board.

And they found that when they had a protocol for those animals – which again, this is where checklist protocol becomes a little bit blurry as we were discussing earlier – but when they had a protocol that said, 'When these suspect animals come in, here's your sort of checklist of what you should be thinking about', they did find that their time to the first antibiotic administration was significantly shorter. So, again, that's an area that I think is worthy of further exploration.

And in human medicine, there's lots of other areas being explored. I mean, with my background in emergency, I'm particularly interested. There's a WHO, World Health Organization trauma care checklist that is being used in human medicine now, and that I think will be something that we would like to, well, we're looking within Vets Now whether that can be adapted for veterinary use, and it's been reported as being associated with substantial improvements in patient care.

And also, there's been a couple of papers from the human medicine side for looking at deterioration of hospitalised patients and making a decision, a checklist to check through of when a hospitalised patient is deteriorating: do they actually need to go to the intensive care unit? So that kind of ability to recognise and to take prompt action for patients that are going the wrong way. So again, I think that's an interesting area.

The other area that I think we should be exploring (and in human medicine I think they haven't really nailed yet either) is actually the use of communication checklists for handovers. So we know that when patients are handed over between different clinicians, that's a time when information is lost and errors can occur. And I think there's still a lot of debate around the best way to do handovers, but I think that's another area where I would anticipate that in the fullness of time, some form of a checklist would be useful, because that is an area where, as I said, errors are frequently concentrated around things that happen at handover.

LC: So essentially a non-clinical checklist, which could have great impact?

AB: Yes, yes, essentially, I think so. I mean, my gut feeling – again, I don't have any evidence for this – but my gut feeling is, we know that errors can occur following that, so it might make sense. You're transferring huge amounts of information – it's easy to forget stuff. And again, people get distracted during handovers, and so on.

So all the factors are there that would suggest that it might be an error-prone moment, and there is data to support that. I think what we haven't done is go that next step and design a system yet that helps to reduce that, or not that I'm aware of. But I would strongly suspect that will be an area that would yield great, great benefit.

LC: So time is coming to a close. Can I ask you, given your presidential role, what, to your mind, is the Royal College of Veterinary Surgeons' role in encouraging the use of checklists, and also in monitoring their use potentially?

AB: So I think that that's a really good question because, as we've been discussing a lot today, so much of checklist use is about that positive culture, and that recognition that, you know, we're not individual clinician islands, that we are part of that wider team. I think, historically I guess – and this is one of the things I still worry about – the College is seen predominantly as having a more punitive role for when things do go wrong. And I think we as a College, and working with Knowledge, are doing a lot of work around creating that more just culture within the profession: recognising that mistakes happen, that if you do make mistakes, don't be scared. You're not suddenly going to lose your rights to practise if you make mistakes and are honest about them.

And I think where the RCVS can have a role is really speaking up increasingly loudly (which we're already doing), but continuing on that trajectory of promoting that just culture within the profession, promoting interprofessional teamwork, and leading a positive culture. I think there might be a role within the Practice Standards Scheme for the use of checklists, amongst other things, that promote that team culture, as part of what's evaluated during a practice standards inspection. But I think that, I would certainly feel very strongly that should be framed in a positive best practice light.

LC: So Amanda, final thoughts on checklists, if I may?

AB: So well, it's been great to spend so long chatting about them because it's a topic I feel very strongly about, but I think it's really very timely, and I suspect over the next few years we are going to, it's part of an increasing movement from that very individual clinician knowledge and technical expertise focus (which is always going to be important, but I think has historically been the main thing we focused on), but moving towards that much wider recognition of the whole team and system and process alongside the individual knowledge and expertise, as being really important for patient welfare. And I think that will be in the fullness of time, a real paradigm shift in terms of the quality of care we can give to the animals under our care.

LC: Amanda, thank you so much for your time and for sharing your thoughts with us today.

AB: Thank you.

LC: For more information about checklists and for podcasts from RCVS Knowledge, go to our website at rcvsknowledge.org. You can also find our podcast on iTunes and Podbean.