QI Boxset: Using Systems Thinking to Reduce Errors

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Welcome to the Quality Improvement Boxset by RCVS Knowledge, a series of webinars, podcasts, and video interviews for practices and practitioners.

Pam Mosedale:

In this presentation, we'll be thinking about how we can use human factors and systems thinking in practice to make the practice day run better and also to reduce errors. Human factors or ergonomics is the science of looking at how people and other elements of systems work together and interact, and it's about trying to design systems to make it easier for people to do the right thing, harder for people to do the wrong thing, to optimize people's wellbeing and to optimize system performance. So everything in the system works efficiently and as it should do. When designing systems, people who use the systems should be involved in the design. They either should do the designing or should be involved in it because they know how things really work, and it's really important that people don't have to change their behaviours to accommodate a bad system. A bad system can mean that maybe there's musculoskeletal pain from having worktops and benches and computer screens at the wrong height or it could lead to tiredness, and fatigue. All these things are part of using a bad system, and generally, if the system's bad, it can lead to mistakes and errors. And when we look at mistakes and errors, we should think about what went wrong, not who went wrong, and remember that generally there are not bad people, but there are bad systems and often a bad system is at the base of many errors that occur.

Let's look at some simple systems that can make life easier or prevent errors. So one of the simplest ones is the system now that makes it much, much more difficult to put the wrong fuel in your car. It was very easy to put petrol in your diesel car or diesel in your petrol car, but now because the nozzle designs have been changed, which is quite a simple change, that's a lot more difficult to do. I'm not saying it's impossible, but it's a lot more difficult to do. Another little example I saw on my travels, is when you're in a hotel often where there are tea and coffee-making machines, there's a real mess around them. There might be somewhere to put the rubbish, but where do you put the teaspoons that you've used? Well, this particular hotel, I

saw this, which without any notices or anything telling people to put your dirty spoons here, there it is: an obvious place to put your dirty spoons and I hate it when you can't tell what the spoons that are lying around are clean ones or dirty ones. So I think those two are just very simple little systems which show you what can be achieved with systems.

Healthcare, of course, is a much more complex system. Everything we do, even something that might seem really simple like taking a blood sample is really complex. The amount of bits of kit you have to get together in order to do that, someone to hold the animal, all the needles, catheters, tubes, everything. It is complex, but that doesn't mean that we can't use systems in order to improve how we work and improve the results we get.

As with everything with QI, it's really, really important to involve the team in inputting into what systems work and what don't. Often as a result of something that's happened or just in those discussions of 'what's the pebble in my shoe'. It might come up that a particular system isn't working and the team will know what's actually done rather than what maybe the manager imagines the team doing or the protocol says what the team should be doing, but what they're actually doing is workarounds and not doing it exactly as it is in the protocols or guidelines. So it's really important to involve the team right from the start when we start thinking about changing systems. And use some of the Quality Improvement tools and remember to have that human factors thinking about how we as humans are often the weak link in the system if you like. So making the system as robust as possible so that it's less likely we make mistakes is really important. Thinking briefly about the QI tools that are used to implement systems. Well, protocols are very important. The protocols are there for things like infection control or control drugs that need to be done in an absolutely set way with a known outcome. But it is important that these protocols are actually, there's coordination between the team, so what the team are actually doing and the protocol is the same thing. We don't want a protocol that's impossible to implement, otherwise you don't have a good system. So really important to have team discussions around these.

Similarly with guidelines. Guidelines are there to help us to have consistent care and the most appropriate care depending on the circumstances of that particular patient. But again, guidelines need to be realistic. They need to be modified to the particular practice and people need to know that they can use them in a realistic way and they don't ask for bits of kit that the practice doesn't have. And so long as those criteria are met, then guidelines can be very useful for putting systems in place to ensure consistent care.

Checklists are a really important part of systems thinking. We can't all keep all these things in our head all the time, probably about five to seven things at a time is the most we can keep on

our head and that's only if we're not stressed or hungry or tired, and checklists can help us to identify those crucial steps which might be overlooked. They can compensate for our memory if it isn't as good as it should be. And so they're brilliant QI tool to use to help with patient safety. And a really important system to implement so that if checklists are always used, it will reduce the chance of errors considerably. There might be surgical safety checklists, might be case handover checklists, lots of different checklists that can be used.

Checklists are not just a piece of paper. They are there to improve patient safety by having a system of work around working safely. So say for the surgical safety checklist, for example, those kinds of questions that are on there about 'what happens if this happens' increases situational awareness with the team. They make you think about decisions in advance about whether we need to do this, that, or whether we need radiographs, whether we need blood, whether we need fluids. So help with decision-making. They definitely help with teamwork because all the team... someone team reads out the checklist, the other members of the team listen to it and respond according to what's happening and very important for communication. Those communication channels are then open, and so if there's any concerns during the procedure, it's more likely that somebody will speak up once that communication has started in the team.

Using evidence-based care bundles is a very useful system to use so that certain procedures are always done together and when done together, these may have much better results than when done individually. But also another great system is having kits ready to go, ready to go kits ready to pick up and take. So maybe out on visits for horses or farm animals, also caesarean kits, foal kits, et cetera. Within small animal practices, having ready done kits for say maybe a chest drain where you've got, in a folder altogether, in a plastic zip-up container, maybe, you've got laminated instructions for how to do the procedure. You've got the chest drain, you've got everything you need, you've got scissors to cut to the right length, you've got a sharpie to mark it absolutely everything you need, which stops people dashing around the practice looking for things. Makes you more efficient, saves time, but also it's a system to ensure consistency and also to reduce the chance of errors. With all these protocols, guidelines, and checklists, it's a good idea to audit their use, to check that the systems are being used as they should be and to discuss with the team if they're not being used, why they're not being used, and what changes need to be made to these systems. It's a way of evaluating those systems that you have in place.

I'm also going to talk a little bit about workplace design. Obviously this is an area where it's very important from the systems thinking point of view that systems are put in place that are robust and which don't depend on the weak link, which is us, the humans, and the dispensary is a place where lots of errors occur, but it's also a place in the practice where systems can be

put in place. So a couple of things there. One is using shelf dividers. If you have medicines of the same medicine but different sizes and they're next to each other, they can easily creep from one slot to the next, as in to any medicine to the one next to it. So shelf dividers to stop that happening. Don't have to be quite as fancy as in that picture where there's completely different sections, but just some little plastic barriers on the shelves is a system of workplace design.

It's also important to have a dispensary that's got good light and has got a work surface that's actually big enough for you to actually put medicines on and dispense them without getting things mixed up if it was a little tiny area and also kept tidy. Those are also important things of workplace design. Another thing there where they've actually labelled their off-license medicines and put them on a separate shelf so that it points out to team members that these are off-licensed medicines and remember to get consent, et cetera. So that's an important part of workplace design.

For systems in the dispensary to reduce medication errors. I don't apologize for particularly focusing on the dispensary because with figures from VetSafe, the VDS error recording system, 30% of errors occur in the dispensary. So I think this is an area that really, really benefits from good systems. So another thing that can be a good idea when you have different sizes, so if they are next to each other, the shelves, you use the shelf dividers. If you haven't got shelf dividers or it's difficult to do that, another way is to put the different sizes on different shelves. So we can see that for those medications, like for instance for the Rimadyl, the two different sizes are on two different shelves but directly above each other, so they're in a logical place for the team to go to. But the sizes, the different sizes, same with the Metacam there, or Meloxicam I think, are on different shelves, so that's a really good system. A little bit contentious, but should you just arrange your dispensary A to Z? I have seen so many medication errors around things like on Onsior/Omeprazole, Vetoquinol or Vetmedin where someone's just grabbed something and it hasn't really, nobody's noticed when they're doing double checking. So yeah, I'm not saying you should or shouldn't, but it's something to think about if you get those things happening. The other thing is having medicines with such similar names, and this goes on to a little bit onto what we're going to talk about in a second about product design. I think drug companies could do better with not having names that sound so similar because sometimes it's part of the branding. But basically, one way around this that's used in human pharmacy is using tall man letters. So the bit that's different gets emphasized as in traMADol, traDOZone, it's really important to think about using those kinds of things. If you're getting those kind of errors, they're systems that can quite easily be put in place.

Thinking about product design, drug companies invest a lot of money in their brand and tend to brand all their medicines the same. So it's recognizable that product comes from this

company, which is great, but sometimes it means the products with very different indications can look very similar. And this practice here up again got an internal system if you like, because they've got three different sizes of an antibiotic here and they're very, very different in which animals they'd be appropriate for. So they've labelled the small size green, the middle size yellow and the top size with red 'stop and think'. So providing the right tablets remain in the correct box, then they've got a system which makes it less likely that us, the weak link in the system will pick the wrong one because it's quite clear and it actually says stop and think.

Another thing which says stop and think is AMR Barbie there who's actually sitting on the top of a box of fluoroquinolone in a small animal practice to remind their team members that this is a high-priority, critically important antibiotic. Do you really need a fluoroquinolone? A bit silly but effective and an equivalent in an equine practice of them actually using stickers saying restricted use, high priority, critically important antibiotic, which they've put on all the packs of the medicines which are the high priority, critically important antibiotics. So again, a couple of things to try and remind us of what we should be doing.

Similarly with veterinary medicines looking very similar. We've got two injectables here, one of which is the sedative for horses, one of which is local anaesthetic for horses, and they're in vials which look very, very similar indeed and have led to issues where a horse supposedly having a nerve block has actually had a sedative injected where the nerve block should be, where it should have been local anaesthetic. So this practice has got their own system here, which I think is great, of actually having two little safes, which are usually separated, they're just there for the picture, one of which has sedation in and one of which has local in. Obviously not so easy if you're out on the road, but there can be systems where one of either the sedation or the anaesthetic, and everybody has to know which and which system, has different labels stuck on or has a colour code or whatever. So lots of ideas for systems that again, help us to do the right thing and help us not to do the wrong thing and not to make an error.

A few more areas where systems thinking can help in the dispensary. We've got a picture there of rainbow trays and I think these are from human anaesthesia, but I think some veterinary ones are going to be developed where each drug which may be used during the anaesthetic induction and maintenance procedure has its own colour and they're all put in the tray. There's one tray per patient. They still use label syringes, but they put in the tray and in certain compartments. So as long as the rainbow trays are loaded very carefully, then it's less likely somebody will grab the wrong one. There's also there about having labels on drip bags very clearly saying what they are and labelling some fluids, particularly for instance, hypertonic saline is easy to pick up instead of other fluids because they all look so similar. All the drip bags look so similar, but having a big red sticker on it or having a red bandage around it or anything like that makes it less likely that that will occur. The drip pump and the syringe driver

there, syringe drivers and drip pump should all be calibrated in the same way in the practice, otherwise, there can be errors. We've got a case example of an error with a fentanyl overdose where syringe drivers that were normally used in the wards were brought in because the one that was normally used in the theatre broke down. So the fetched one from the wards not realizing they're calibrated differently and gave an overdose of fentanyl. So really important that bits of kit used in the dispensary are calibrated the same.

Can technology come to the rescue? Well, I think it will more and more, but there are a few things. There are apps which really help with dosing. It's so, so easy to make mistakes, especially when doing calculations on mobile phones and to be out by factors of 10 or even factors of a hundred. So dosing apps are really, really useful. The other thing is automatic dispensaries. There's an example of one there. Provided the right medicine is typed in onto the keyboard, then the door opens where that medicine is and only that one can be taken out. So that's a really good idea, but again, there's a bit of room for human error. It has to be stocked properly and the right name has to be typed in, in order for it to work completely safely. But it is a good idea and makes it less likely for dispensing errors to occur.

Helps with stock control, has fingerprint recognition for controlled drugs, all sorts of things like that. So watch this space. There's going to be lots more technological systems to help us to make it easier for us to do the right thing and harder to do the wrong thing. Getting away from the dispensary to other areas of the practice. There's other bits of workplace design that are very, very important and systems that can be used. In an equine practice, which had issues with horses getting loose when they were being transferred into a horsebox, had gates fitted. which were automatically closed once a vehicle had gone through, with sensors to automatically close once the vehicle has gone through. Because it doesn't matter how many times you tell people to close the gate and how many notices you put up saying close the gate, it's not going to happen all the time and it only takes a second for a horse to get loose, escape and finish up on a road and terrible consequences for the horse.

Terrible consequences for practice reputation too. So that's just such a nice easy system. Similarly, at one practice, they had two doors from the kennels to the outside world and they had notices up telling people to make sure that both doors were never open at the same time. Of course, that didn't stop people, the training, having notices up, that didn't stop people, but they then fixed a claxon between the two doors, which only sounded if both doors were opened at the same time and that solved the problem. Other systems, going right back to those dreadful days of car park consulting during Covid, having systems where car park spaces were numbered. So because trying to find a grey car in the dark was well-nigh impossible and there was what appeared to be five or six grey cars out there. So just think about systems that can

help to reduce the possibility of errors happening and mistakes happening and animals escaping and all those kinds of things.

What can we do then to improve systems? Well, I think talk to the team. They'll know where the pinch spots are, they'll know where the things go wrong. They'll know how things really work, not necessarily how managers think they work. Find out how that really really happens. Ask the team what little things could be changed to make a big difference. Make sure there's really good communication in place between all different areas of the team, especially between different groups, like between reception and vets and nurses because everybody's got a slightly different perspective, but the way to make changes for it to be holistic or altogether. Make sure to look at workplace and equipment design. Okay, you might not be able to build a new workplace, but you can certainly look at design of equipment, the design of certain areas as demonstrated with the dispensary. Just see what might make things a little bit less likely to go wrong and what might make a place better to work in.

Therefore, reducing fatigue and stress and burnout in team members. Talk to your suppliers about product design. If you think there's a couple of medicines that are too similar, talk to the drug companies about them and you never know if they get enough people feeding back on this, you can even feed back to VMD too, if enough people feedback, then there may be changes. Make sure the practice has got a learning culture. Learn from everything. Learn from everything all the time. And as Mr. Deming who was the father of a lot of these type of systems thinking things said 'A bad system will beat to a good person every time'. So make sure you've got good systems in your practice wherever you can.

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