Transcript: Webinar – Spotlight on guidelines: Water - Automated room decontamination

27 April 2022

Watch the webinar

During this webinar our expert panel answered questions on the Automated room decontamination report produced by the HIS Working Party.

- **Peter Wilson**, Consultant Microbiologist and Chair of the Working Party
- **Alan Beswick**, Principal Scientist, Microbiology
- **Mark Garvey**, University Hospitals Birmingham
- **Claire Haill**, University Hospitals Plymouth NHS Trust

Chair: Joanna Walker, NHS Grampian

Disclaimer

The HIS webinars may contain expert opinions and preliminary reports of work that have not been certified by peer review. They should not be relied on to direct clinical practice or health-related behaviour and should not be reported as established information without the consent of the panel members.

Uncertified transcript

The following transcript of this HIS webinar, or any portion thereof, is being delivered UNEDITED and UNCERTIFIED by the Healthcare Infection Society and Panel Members and was created using artificial intelligence software. The reader agrees not to disclose or copy this uncertified and unedited transcript in any form (written or electronic) to anyone. This is an unofficial transcript, which should NOT be relied upon for purposes of verbatim. This transcript has not been checked, proofread, or corrected. It is a draft transcript, NOT a certified transcript. As such, it may contain computer-generated mistranslations, resulting in inaccurate or nonsensical word combinations.

Joanna Walker 00:07

Good evening, everybody. Welcome. We're just giving time for people to link in. Thank you for joining us tonight on this spotlight on guidelines webinar.

And today we'll be focusing on automated room decontamination and the Healthcare Infection Society Working Party report which was published earlier in the year in the Journal of Hospital Infection, and it's freely available to download.

We're really lucky tonight, we're being joined by our panel who are authors on the guidance development team. So we'll have them discuss live and hear their thoughts on the guideline recommendations.

So automated room decontamination systems. These are a significant revenue and capital expenditure for any hospital, which needs to be balanced against potential reduction in hospital acquired infection. So, the guidance was prompted by a recognition that many hospitals are either already using these systems or preparing to invest in them. Suppliers of these systems obviously act in an intensely competitive market for which there's actually no independent oversight in terms of responsibility for comparing systems or advising on their use.

So the Working Party report is intended as a sort of means to provide independent oversight and practical guidance for hospitals on the use of these systems. So tonight, during the webinar we will include a couple of polls which will be a great opportunity to find out what other hospitals across the country are doing in terms of these systems.

We've also asked you to pre submit some questions and for the first 40 minutes the panel will discuss these. Then, in the last 15 minutes, they'll be able to answer your questions, live. So as you're watching, you're very welcome to put down any questions you have for the panel. You do this using the Slido app. So if you download Slido, use the enter code #HIS. This will take you to the right place and you can submit your questions and you can also like questions that others have submitted and this will allow everyone to prioritize the most popular questions to be answered. The panel will answer as many as possible in the last 15 minutes. So, let's move on to our panel. Now I'm going to ask them to introduce themselves. Can we start off with Alan?

Alan Beswick 02:41

Hi, I'm Alan Beswick and I'm a Principal Microbiologist based at the Laboratory of the Health and Safety Executive in Buxton.

Joanna Walker 02:54

Claire?

Claire Haill 02:56

Good evening. I'm Claire Haill and I'm the DIPC and Nurse Consultant at University Hospitals Plymouth Infection Control Team.

Joanna Walker 03:05

Peter?

Peter Wilson 03:07

I'm Peter Wilson a recently retired consultant microbiologist at University College Hospitals and Professor of Microbiology at University College and I've been interested in this area and have founded a research laboratory that has been doing some of these comparisons between the different automated systems.

Joanna Walker 03:31

And lastly, if I can get Mark to introduce himself. Now we're having some problems with getting visuals. So it may be we don't get those.

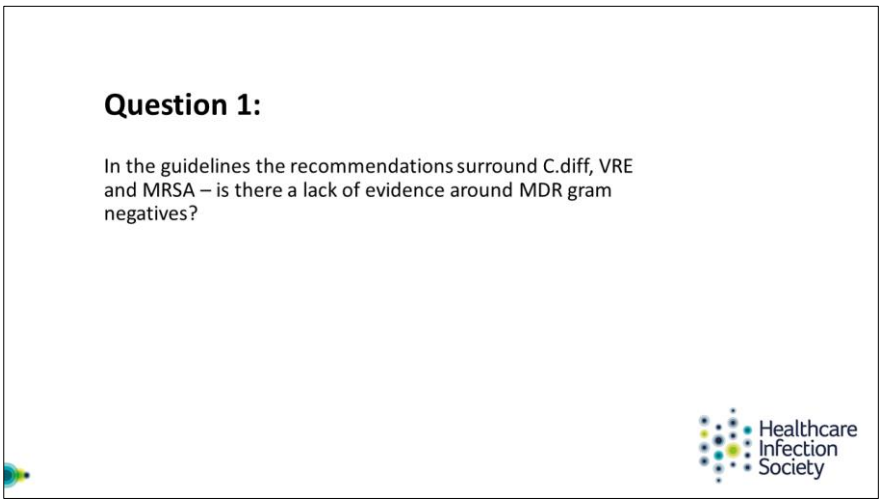
Mark Garvey 03:42

Hi hopefully you can all hear me, I'm Mark Garvey, Consultant Clinical Scientist, and Deputy Director of Infection Prevention and Control at University Hospitals Birmingham. I'm also the director of the hospital infection research lab in Birmingham. And like Peter, we've tested a few automated decontamination systems so I have an interest in that as well.

Joanna Walker 04:07

Great. Thank you everyone. And behind the scenes, we'll have our production team Bee, George, Helen and Moira at his headquarters. I'm your chair tonight and my name is Jo Walker. I work in microbiology and infectious diseases in NHS Grampian in Aberdeen.

So let's begin with the first question. So question number one, and I think this one would go to you Peter



Peter Wilson 04:55

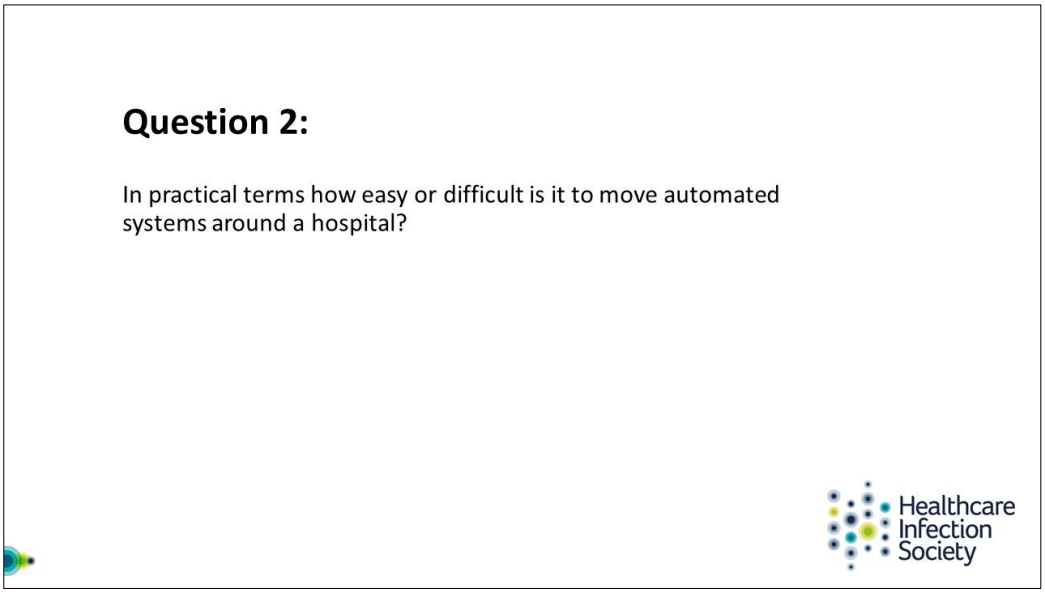
I think the reason that we concentrated somewhat on the first three pathogens is that they can be quite persistent in the environmental quite difficult to eradicate. *C. diff* as spores which are fairly resistant to many disinfectants and also to UV light. VRE is difficult to remove with some disinfectants and MRSA spreads very rapidly throughout the environment. But the evidence for Gram negatives is actually very good. The reason is it is less in the news is because almost all of these methods as well as manual methods are pretty good at eradicating Gram negatives from the environment. Where it becomes difficult is if there is a biological fluid on the surface. So, in other words, mechanical cleaning prior to using these methods has not been as good as it should be. Or if if the area is wet, because with a wet area. It's very difficult for these automated methods to actually make a difference. So things like *Klebsiella* for example, you could get a 10 to six kill with hydrogen peroxide, UV light of any kind, without too much difficulty and there's no spore to form so I think really your caveats for Gram negatives are where mechanical cleaning has failed.

We know from observational studies that whenever cleaners go in, even if they seem very competent cleaners, they will miss about 30% of the environment. That's not because of poor technique or anything it is simply that they can't see where they've cleaned. And these are the areas where the Gram negatives can link to where automated devices will penetrate and eradicate.

So, I think it's really important that we take regard to the manual cleaning, and make sure that our cleaners are well versed in how to clean and above all they don't assume that because somebody is using an automatic robot after they've cleaned, that they don't need to clean so effectively.

Joanna Walker 07:40

Yeah, thank you that's very useful I if anybody wants to add anything at this point. Obviously, I can't see you needing to happen. Okay. Should we move on to the next question? Thank you



So, question number two and I think that this was one to you, Claire.

Claire Haill 08:34

So they are very easy to move around is the simple answer, and they aren't designed to be manoeuvrable. They are all on wheels and have got handrails. There are some differences. The ultra violet ones tend to be a taller, slimmer unit. Perhaps more vulnerable with the lights elements. However, all the sections are slotted into that one mobile section. So, you only have one piece of kit to move.

And if we look at the hydrogen peroxide units, they have more sections that need to be moved. So you tend to have to have those on a trolley so they can be moved just as one unit. And then we can go set them up, there's a bit more manual handling in terms of setting things up. But essentially, economics have been considered as these units have been built and they are fairly sturdy. Because they're on wheels, they obviously will need to come to flat surfaces and they will need to be moved around with the use of lifts conveyed around the hospital settings.

Joanna Walker 10:14

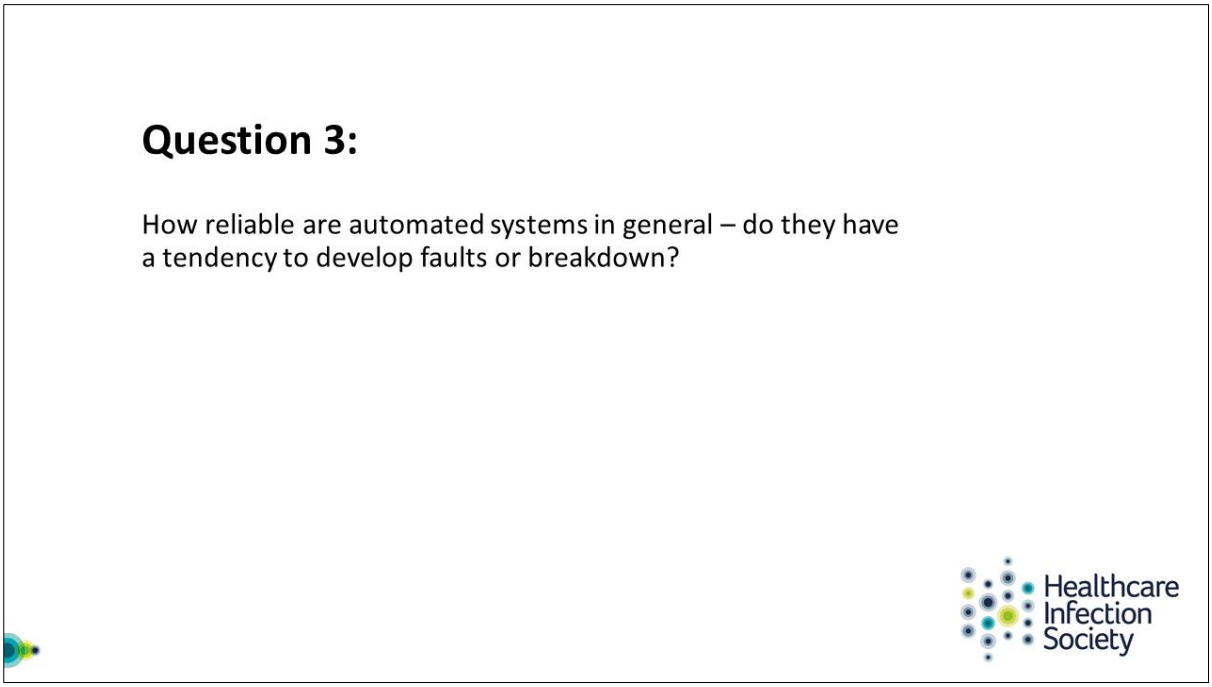
Thank you very much. So, question number three

Alan Beswick 10:28

I think this for me, isn't it?

Joanna Walker 10:30

Yes.



Alan Beswick 10:42

Well, I have to confess I've given presentations in the past where I have talked about some of the weaknesses of certain types of systems without naming any brands names.

My personal experience of working with these systems is often very intense usage testing them in a laboratory test room environments, often over several weeks. There are some systems that are incredibly reliable, some fumigation systems, for example, which commercially you know, there are people using them more than 10 years after buying them and they're still in active use. Again, I won't name any brand names, but there are some very good examples of well known brands.

But we have seen some breakdowns. So, for example, even some fairly recent testing work during 2021. We observed some leakage of liquid hydrogen peroxide from underneath a fumigation system it was very quickly remedied. Our experiences that the suppliers of the systems are generally extremely supportive and very often actually problems can be sorted out over the telephone it doesn't even necessarily need someone to come out to do a piece of maintenance on the equipment.

With some recently tested UV systems, because of a slight degree of overheating with the lamps, we found that a cabinet based system was switching off prematurely and wasn't completing the full duration of program treatment. Whereas when we left it for longer periods between treatments, it formed the okay so we kind of raised this with the supplier - we were able to complete our experiments that were no complete failures and we rarely ever seen a complete failure.

So, I'd say that, yes, we have observed some inconsistent performance, but on the whole I would say that 80% of the equipment we tested, whether that the irrigation equipment or UV type equipment has performed exactly the way that the supplies have said it should perform. So, I think people can have a reasonable amount of confidence, but also in the fact that you know, certainly all of the suppliers that we've worked with have been very responsible, very supportive. So, we've got all problems encountered they generally responded very, very quickly, to help us to solve all those problems and

Joanna Walker 13:02

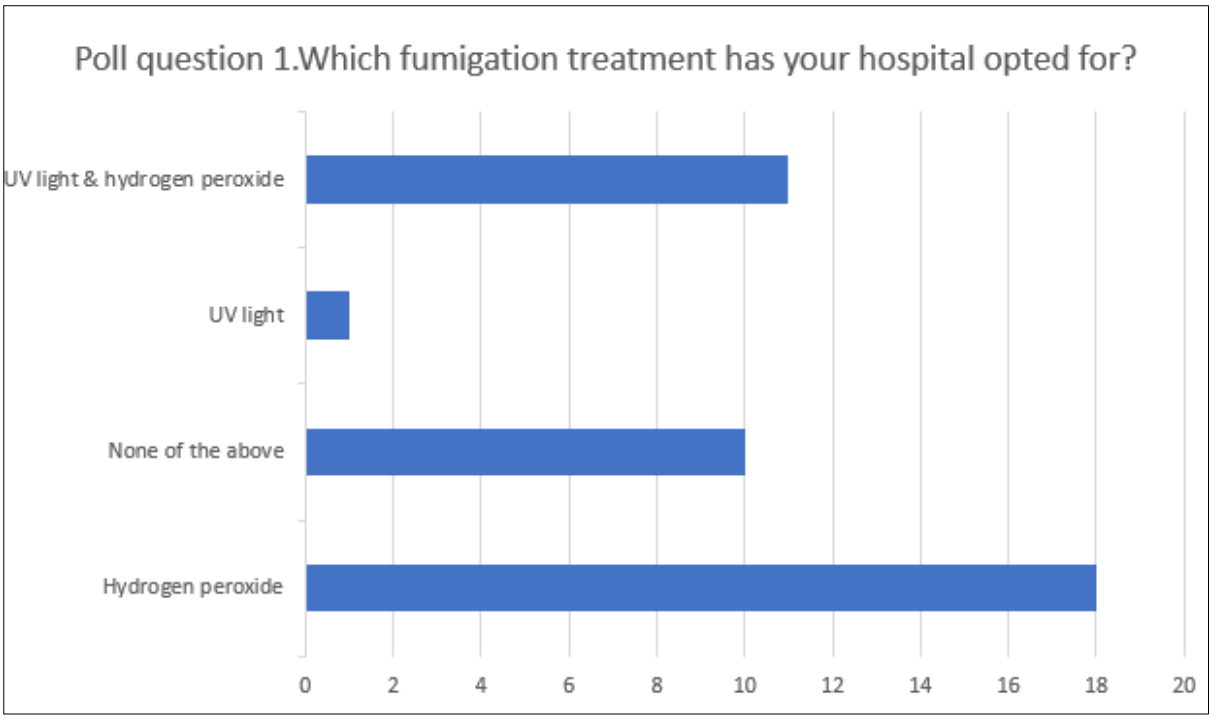
That's hugely reassuring answer.

Alan Beswick 13:06

They are complex pieces of equipment. So I think that you know, it's inevitable that sometimes you know, you might get pinched tubing or valves that don't work inside the machine. And sometimes Yeah, they do need attention even between maybe maintenance periods.

Joanna Walker 13:23

Is this same? Everybody else's experience on the on the panel. I'll take that as a positive? Yeah. Okay. I think it's time for our first poll.



So this is great. This gives us an idea across the country of people joining in what the different hospitals are doing.

That's quite an interesting response. I don't know is it in keeping with what anybody on the panel would have expected the response to be any any thoughts on those answers at all?

Peter Wilson 15:06

I think that's actually quite interesting because I would have suspected that more people would have gone for UV light because of the slightly more rapid turnaround times than hydrogen peroxide. Hydrogen peroxide is the more effective, but also very toxic and difficult to contain. So that's actually quite an interesting result. Actually you need to have both.

Alan Beswick 15:36

Yeah, I thought so too Peter. That was interesting. That was quite substantial percentage that seems to have both technologies on site.

Peter Wilson 15:42

Yeah. Well, that's what I prefer people to have.

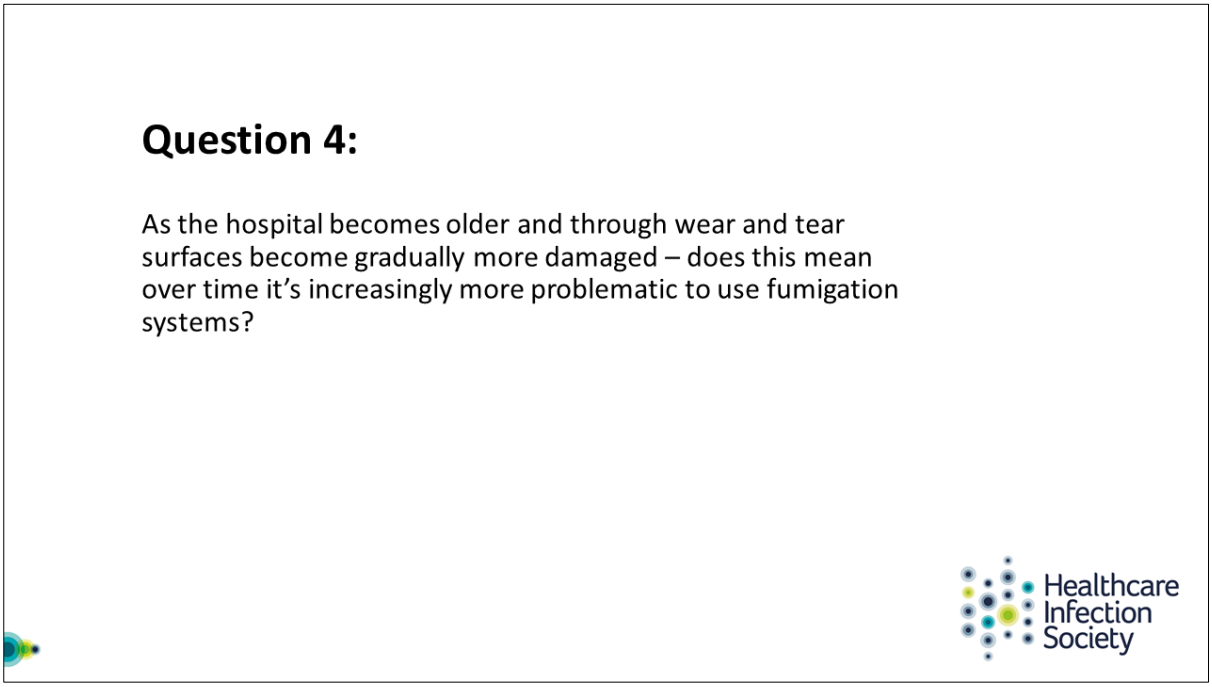
Mark Garvey 15:45

At the hospitals in Birmingham we've got both technologies on site due to the very different makeup in the nature of our hospitals estates, so that could be very much reflective of that.

So we've got very old estates, where we tend to use more of a hydrogen peroxide type of clean. But then where we've got a new estate, if people are familiar with Birmingham, we've got four hospitals. We've got the Queen Elisabeth which is brand new with 44% side rooms. And we use a lot more UV in that setting due to the side rooms, compared to the older estates where you're limited by the side rooms, where we predominantly use hydrogen peroxide. It's interesting because when you look at nowadays when you you're looking at the hospital currency, and the pressures - and this is highlighted coming out of the COVID pandemic, really with all the surgery backlog and things like that. Now, operational pressures, there's a high turnover of getting patients through the through the hospitals. So the UV technology, where the faster cleans for example. At our hospital, we have a standard clean it's 45 minutes for a room prep and then after that, you know we will use a terminal room automated system and hydrogen peroxide (can be over an hour) and then UV which is 15 minutes, so it is interesting, isn't it?

Joanna Walker 17:20

And we obviously didn't get breakdown a correlation between these sites that are using both are they actually mainly sites that have got old and new parts of the site? Yeah, it'd be interesting to delve into that a little bit more. Okay, so Mark, I think the next question is yours if we go to question four.



Mark Garvey 17:47

Yes, this question so yeah. As the hospital becomes older, through wear and tear surfaces become gradually more damaged. Does this mean over time it's increasingly more problematic to use fumigation systems.

And I think really the short answer to that is 'no' because we've got a very we've got like I've just mentioned, we've got an old estate, and we do use fumigation systems in that and the predominant one we use is like a hydrogen peroxide.

We do use UV as well, where we've got side rooms.

I think it is important to note though, you really don't want a damaged environment, and it's referenced in our guidelines, anyway. There's a nice little section around damaged surfaces. And you know if we've got damaged surfaces, it creates areas/cracks and things where organisms can get in and that just affects the clean anyway. You hope in a hospital environment and in a room or what have you the estates work should be up to scratch where we don't have damaged environments because that makes it more tricky to clean.

As we mentioned through the guidelines it was important to have that effective clean to begin with effective terminal disinfection anyway so having a room that's not full of cracks as its difficult for any system to clean.

Joanna Walker 19:34

Did any of you have any further thoughts you wanted to add? Go for it Alan.

Alan Beswick 19:43

Yeah, I mean, I absolutely agree with what was said there. I suppose the only thing to be wary of …..

Mark Garvey 19:57

I was going to say one of the issues is doors on the bays, things like that. If we haven't got those. It's very difficult to do those terminal room disinfection. So yeah.

Alan Beswick 20:09

No, it was really just to pick up on the kind of material side. I think this is perhaps more of a laboratory thing than it would be maybe for a clinical environment situation, but we certainly done work in the past with hydrogen peroxide and we know that things like textile materials and things like cardboard can act as a sink for airborne disinfectant, so you can get what's called an off gassing effect.

If you've got if you've got porous materials. And we've also observed this even in covered mattresses that have been left in rooms where you clear the room with the air- we've got a test room where we could we can vent the air very rapidly and aerate it very efficiently - and you might then go into that room and feel that you've cleared the air of any remaining hydrogen peroxide for example. However, we literally found that if you sit on a foam mattress, even with an impervious cover on it, and bounce up and down a couple of times, if there's for example, a zipper at one end, you will often detect hydrogen peroxide coming out of that foam.

So, I think that people need to be very careful about what materials they leave in a room. If they're treating it quite intensively with a hydrogen peroxide, airborne disinfectant, and that will probably be the case for all the types of airborne disinfectant as well. Hydrogen peroxide seems to be the one that's most commonly employed.

So just a bit of weariness there over absorption during the process, and off gassing afterwards, which may even occur beyond the aeration point if those sorts of materials have been left in a room.

Joanna Walker 21:48

Anybody else have anything further to add?

Claire Haill 21:53

Can I just ask Alan, how long would you predict that off gassing for the mattresses? If we leave the mattress in rooms?

Alan Beswick 22:08

I think Claire as well, it may well be related to types of material that are in use. So, this is something that could easily be evaluated within a given environment.

We've noted you know, levels of hydrogen peroxide which exceed the workplace exposure limit - we've noted that sometimes for hours afterwards actually. Yeah, so we can you know, that's under experimental test conditions. So that's after hydrogen peroxide-based work, where you're delivering maybe several 100 parts per million of hydrogen peroxide.

So that's where the more intensive treatments, obviously there are systems around there which work from a lower starting concentration, and then delivering much lower levels into the room as well probably more like 100 to 200 parts per million.

This may not be such an effect with those sorts of systems. With systems that are delivering you know, several 100 parts per million hydrogen peroxide, we've certainly seen this this kind of absorption and the off gassing effect. It's just something to be aware of maybe to just check with given materials in particular treated space.

Mark Garvey 23:17

I think it’s a valid point, Alan. Because you know, a lot of people when they clean a room and have terminal cleans, you’ll walk past it on a ward and you look in there and then everything's in that room and you just think well, you know, that put all the pieces of equipment in there don’t they.

So everything goes in there and just think let's think about this logically. So I think it's important point that everybody sees it is the be all and end all. That effective clean at the beginning is important.

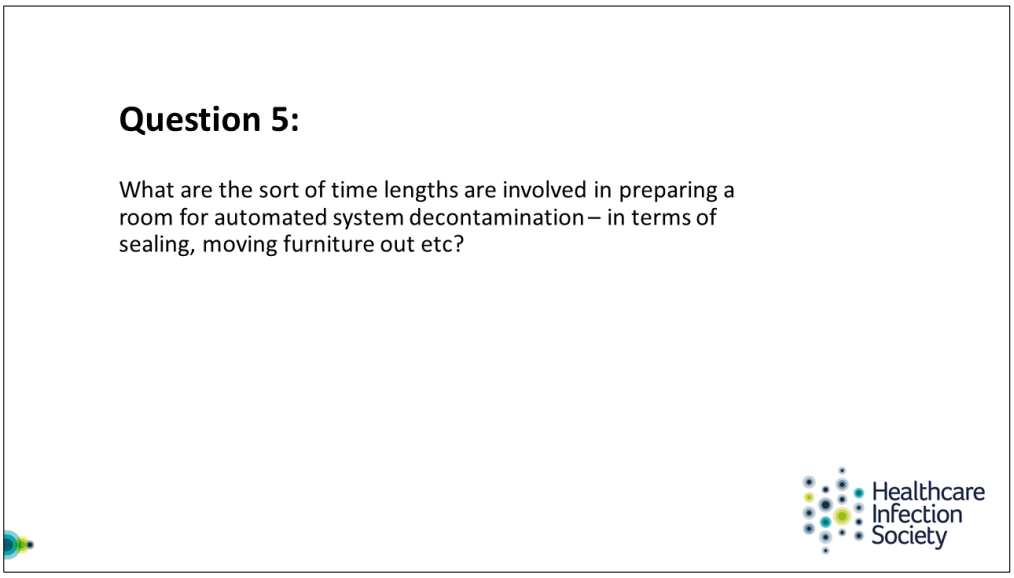
Peter Wilson 23:49

The thing you really got to be very careful of is the training of the operatives who go in to do this, that they do ensure there's an adequate off gassing time. So they must really carefully follow the manufacturer's instructions. The temptation is, unfortunately, because of the pressure on beds is to cut the times and to go into the room to soon and we've certainly seen this happen. And sometimes

you do get ill effects. So it's really important for the safety of the operators that they are properly trained.

Joanna Walker 24:28

Yeah, that's a very interesting discussion. Let's move on to the next question. Claire, I think this one's for you.



Claire Haill 24:56

That leads on quite nicely, doesn't it? So, I think probably the standard approach that anyone would take when, you're… you've got room that has just been vacated from a patient with an infection, you would go through all your normal processes that really shouldn't be shortcuts anyway. So, you… you just get rid of all the equipment that's in use that… the waste that needs to be removed from that room. Then the equipment would get cleaned. What equipment is able to stay in there to receive the… the… either the ultraviolet light or the hydrogen peroxide cleaning or decontamination process can obviously stay there. But as you just said, anything that's porous needs to be cleaned and then removed. So this… this sort of period of time, you know, that's gonna be a good half an hour I would say, to do that properly. And that then goes from the ward staff on to the hotel services staff. And then the full decontamination process could take anything up to another hour, hour and a half depending on the size of the room. And then if we're considering then any off gassing, then perhaps that is something we need to be thinking of. Something else I'll take forward now, and just check on those processes. But talking to our hotel services team, they estimate that the whole process now takes them two hours. So we've been using one particular system for a number of years now. So obviously at the beginning, when you first introduce those, then that will take quite a long time… take longer, but just because people need to become more familiar with processes. And then the other side of that, they become too complacent, and they haven't covered all the safety aspects. So I would say that probably two hours is a comfortable time for a standard single room that might or might not have an ensuite facility. But in terms of the other preparations, leaving the porous equipment out and all the items out of the room, and then preparing the actual setting the room up correctly is vitally important. Because if you don't open the drawers, or set things so they're not stacked on top of each other, you won't maximize the effect of, you know, what you're trying to achieve really. And then you've got to… to do the ventilation if you've got any extracts in there. If there's any drafts coming

around the window, you want to be able to do the sealing of that as well. So all that will that process needs to be factored in if you're considering any of these systems as part of managing the expectations of the operational site team. I think it's important they'll always want the room back quicker than perhaps you want to be able to give it back to them. But those safety mechanism… mechanisms need to be included into your time factor.

Joanna Walker 28:48

Okay, can I ask you how many people might be involved for a sort of a turnaround?

Claire Haill 28:55

I think, well you know, you'd have your… your nursing staff you'd have maybe a domestic doing the hard surface cleaning and then someone else who might be the operative, or it could be that someone is the same person. So that might depend on how you set… your operations are. But certainly our experiences that the… that the room would be cleaned by the domestics that are on ward and a call would go to a, you know, the rapid response team who would come up and they are then trained to just do those additional activities. But that could vary.

Joanna Walker 29:40

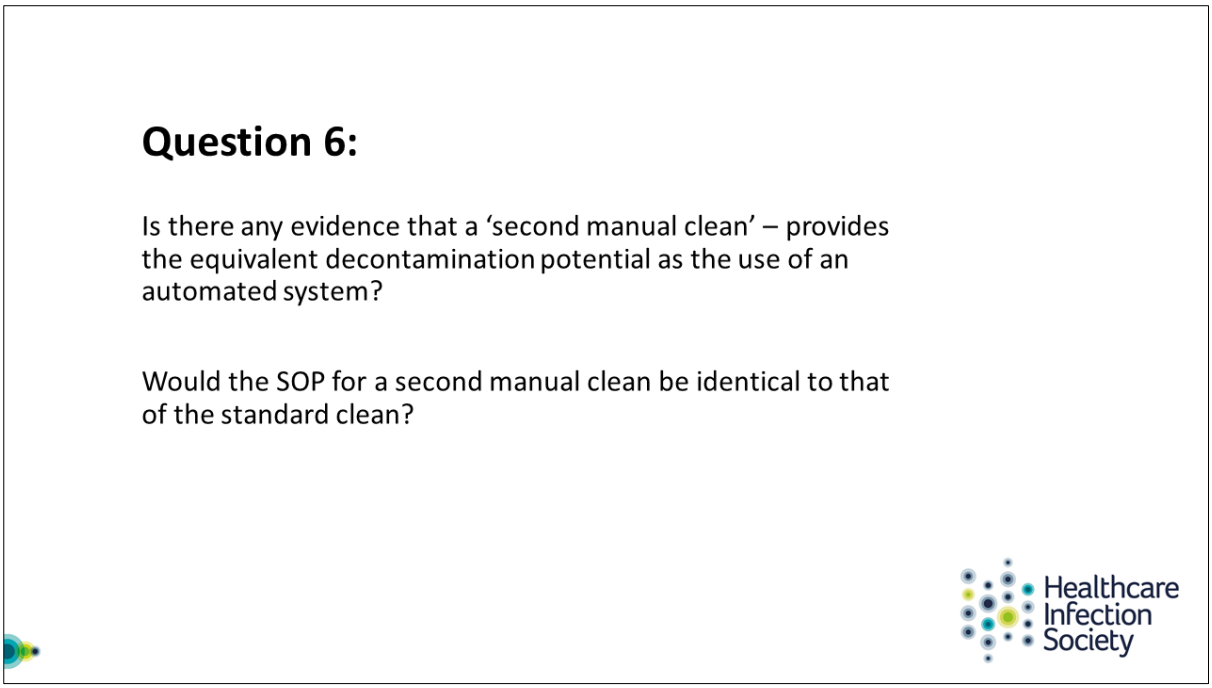
And where does all the stuff, you've moved out go?

Claire Haill 29:51

Well, like anything that's been obviously needs to be cleaned and taken out of the room, so it goes into the corridor in the first instance. But if the nursing staff are taking those bits out that they know cannot be decontaminated, then that should be cleaned and go straight back to wherever it needs to be stored. So you shouldn't get a build-up of things in the corridor but in reality, I'm sure that does happen.

Joanna Walker 30:17

This is useful to know in practical terms, how it how it really does work. Does anybody else have anything that they want to add to that? Okay, let's move on. So, I think the next question is yours, Peter. Question six.



Peter Wilson 30:41

Right, so is there any evidence that a second manual clean provides the equivalent decontamination potential as the use of an automated system? Would the SOP for a second manual clean be identical? You would have thought that this was a really heavily investigated area but it's not. There are a few studies comparing usually a single manual clean with an automated system does. There's one for hydrogen peroxide. There's the Anderson study that was in The Lancet in 2017 for UV light where they… they… they found that UV did reduce bacterial counts a bit more. But really what's lacking are good studies where you compare repeated manual cleaning with UV or hydrogen peroxide which tend to be done once or perhaps twice. And that's it. So what is the effect on the average number of organisms in the environment? And bear in mind that even if you eradicate that, 10^6 using hydrogen peroxide, within three hours, putting a patient in that room again, you're almost back up to the pre hydroperoxide level. So the important point of doing it is not to necessarily remove all bacteria from the patient, which you can't do but perhaps to try and at least eradicate the harmful pathogens. We did a study 10 years ago now, where we randomly assigned rooms to manual cleaning twice a day instead of the standard once a day. And then the other group was a single manual clean. And we wanted to see if the second manual clean would make any difference. So there's no automated robots involved in this particular study. And indeed, by doubling the cleaning we halved the average number through the day of MRSA that was being isolated from the environment. There was simply, at that time it was 14 going down to eight or nine percent of samples had MRSA because we had a lot of MRSA in 2011. The other pathogens had a similar effect, but there were far less of them. So it was very difficult to say there was statistically significant reductions but certainly a manual key as common sense would tell you improve the bacterial burden in the environment. And the interesting thing was, it halved the number of pathogens on the hands of the doctors and the nurses that were in that environment. So clearly, there was going to be a potential to reduce hospital acquired infection. Going the next step and say, actually doubling the cleaning would halve hospital acquired infection is quite difficult because you need a really big multicentre study such as Anderson did in the US. So I think what we have found though, is when we're doing sampling of the environment, we've done this in a

number of our studies now, that when you have double the cleaning, your average bacterial count is reduced quite significantly. If you just do a single hydrogen peroxide, you of course reduce the bacterial count much more at least for the next few hours. But the average over the next 24 hours is not dissimilar to a double clean. So those of you not using automated cleaning, you can achieve a good result with improving the frequency with which the manual clean is done. I must add though, that if you look at this paper, one of the significant contributions in the in the working party paper, which Moira did, is the network meta-analysis. Now, this is a very clever statistical way of comparing trials where they haven't actually made a direct comparison. So here you can see across a vast number of trials that we found, what the likely effects of say UV versus a manual clean would be if you did a direct comparison. So I do urge you to have a look at that section. It's really quite interesting. But it does show that UV and hydrogen peroxide, as you might expect, reduce bacteria more than manual cleaning. But bear in mind it's the overall average effect over 24 hours you're really interested in.

Mark Garvey 36:00

It's lovely to see an actual paper. Nice to see a cleaning paper in Lancet. Just so, it's nice to see the importance of the environment being in a journal like that. We did a similar piece of work as Pete… Peter's. Looking at manual cleans in our acute medical unit on admission, one of our admission units of the emergency department and acute medical unit was the next one where we focus primarily on the manual cleans in… in… in that environment. I think Mike Weinberg showed a bit of work… similar… similar piece of work, up when he was in Chesterfield, on… on this ever nice talk about… about this but we focused like Peter on the on the manual clean in our acute medical units and we just do very crude environmental sampling of the of the environment and see what we got we've what we've got for chosen viable counts as well as, as well as some other… other nasty bugs as well from C Diff, MRSA, things like that, that you can pick up. And it was quite interesting compared it after various different… different cleans, is often very… quite difficult to get an automated room clean in an AMU or in an ED because of high throughput that we've said because of that, because the turnover in there. And, we've got educational packages around the manual clean and the added benefit of that bit… added benefit to that we saw, really weirdly, a bit dropped due to the educational package we put in around it was Peter alluded to earlier about education of staff and that's a really important point. We saw a massive drop down in our C difficile numbers across the Trust, and a lot that we were looking for in that acute medical unit. And then, like I said, it was across the whole Trust. So like AMU and EDs were like mixing pots, seeding organisms in there. So it just goes to show the importance of the cleaning and educational package about it. I often give talks as well, when you talk about like… when I say a lot of talks, it's a nursing staff and doctors who are new, when you talk around like how many people have actually been educated in the role of cleaning and you ask the audience to stick their hand up and say who's actually been taught during their degrees and stuff of the importance of all… all of this. And you barely get the hands up in that audience. And, you know, it's a big thing that you expect people to know how to do, isn't it? I digress.

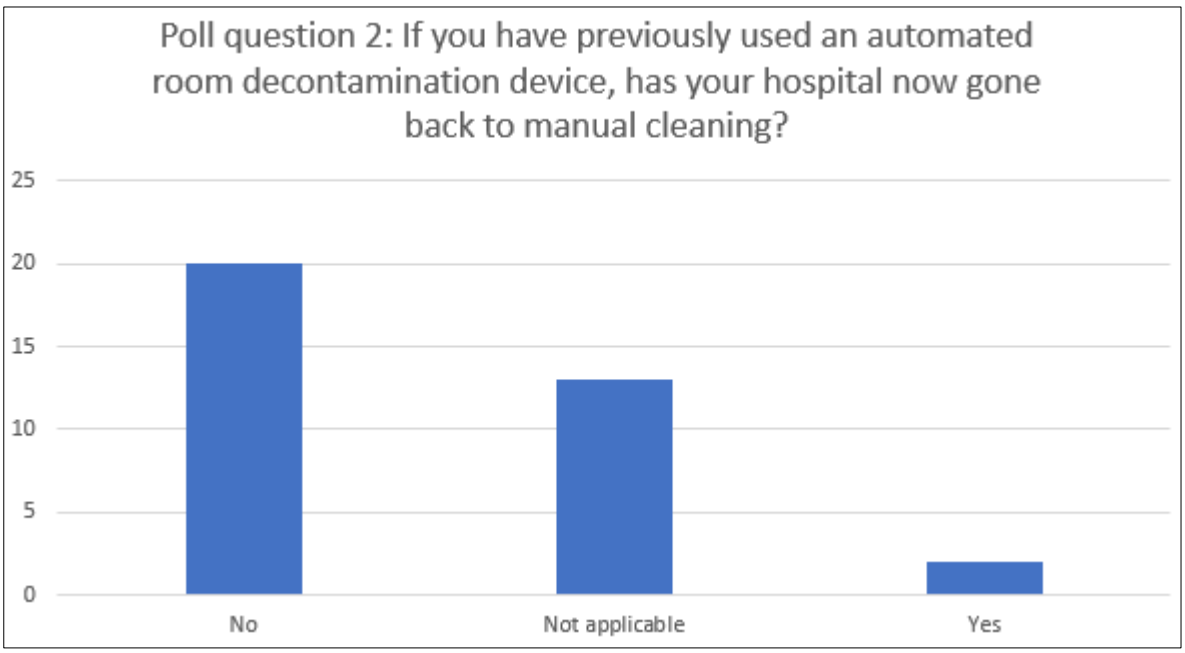
Peter Wilson 38:39

I think a number of studies now, including one we did, show the benefits of using one of these automated methods on C diff. Because where you have got a C diff problem. A lot of the C diff in the environment is responsible for the infections in patients, much more probably than transmission between patients. And there's a number of studies now whether they've looked at DNA analysis to

demonstrate this, but when you use the automated methods as long as they're effective against C diff spores, they do reduce the number of C diff infections. I think the problem is though that you could have the same effect by doing the education of the cleaners and then it's the whether the administration wants to pay for additional cleaners, will they rather pay for a robot!

Joanna Walker 39:42

Yes, very interesting. Interesting point. Thanks. Both for those insights , it is really important. Poll number two. Let's go to that. And the other thing to remind people as we're looking at this poll is, as you're adding questions to slido, please remember to like ones that are down there to help us prioritize the questions. So, poll number two, if you have previously used an automated room decontamination device has your hospital now gone back to manual cleaning? So, this is interesting. Just a straightforward yes or no.



Maybe we should be placing bets at this point. Okay, so anecdotally is that in keeping with what the panel would imagine those results would be? Any thoughts?

Mark Garvey 41:10

Yes. Yeah, it's interesting that 2 have gone back to manual clean. Okay. Interesting. Interesting.

Peter Wilson 41:20

I suspect that's probably money related.

Mark Garvey 41:24

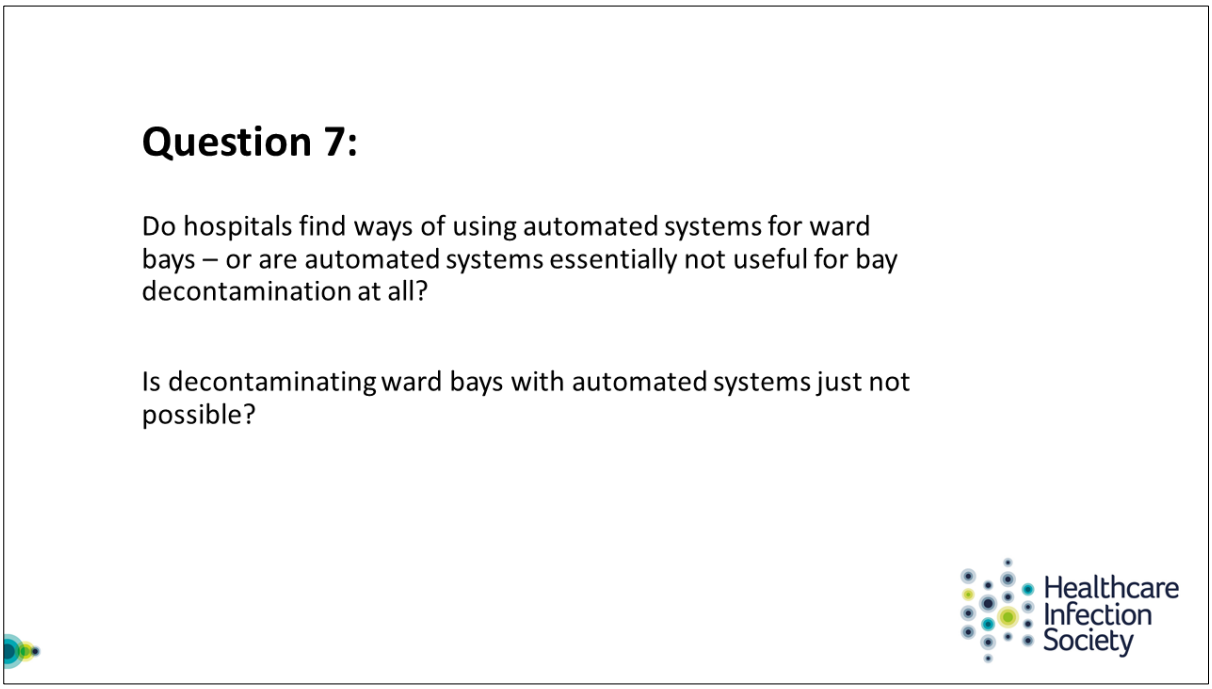
Good point

Peter Wilson 41:28

I mean, it was for a very long time. We sort of didn't go down the automated cleaning route. We relied on our cleaners, but I think possibly, we just don't invest in cleaning staff as much as we should hence the popularity of the automated versions.

Joanna Walker 41:50

Okay, let's move on to question seven. I think this one is for you Mark.



Mark Garvey 41:56

Yes, so, do hospitals find ways of using automated system for ward bays for automated systems essentially not useful for bay contamination at all? Is decontaminating ward days with automated systems just not possible? In a short, again, easy, quick answer to be perfectly honest, we do use automated systems for bays and hopefully you've got that from, as discussed in greater detail and like Peter just alluded, as in *C. difficile* outbreaks, you know, we do heightened cleans with automated systems and we're no different to that. We do find ways to empty the bay and use automated systems in there. It is tricky, as Claire alluded to earlier on, with capacity issues and getting people you know, to clear off a whole bay. We've got various different bay sizes so we're quite lucky in the new QE building that we've got four bedded bays, but we found that to be easier to get one of those completely free with four beds and get that clean. Essentially, a full automated system, clean it in there from maybe, maybe we use a misting pipe point of view, but we'd have used UV in there as well. And then we have six bedded bays, and then we've even got an old an old we've probably moved back into the older QE where they've got a large Nightingale wards in there and we have used automation in there. Going back to my previous answer the key element of all of that is that you can enclose the enclose this is the space . One of the big upgrades we did on the old heritage areas is the fact that we can get, we put doors onto the bays so we can do these automated cleans in the room, because if you haven't got the doors on the bays, it's really difficult to seal it, seal up the big entrances and do do that. So in short answer is yes, we do, do it. UV is a little bit easier when you when you look at it from

time constraints, as Claire mentioned, sometimes easier to get a UV done because, you know, 15 minutes and okay if it fails you have another 15 minutes afterwards. But you know, like I say if we have a *C difficile* outbreak, you know, we all the bays, for example, we've got one now, and that bay has been basically a completely emptied, with room for manual cleaning and hydrogen peroxide on that.

Joanna Walker 44:48

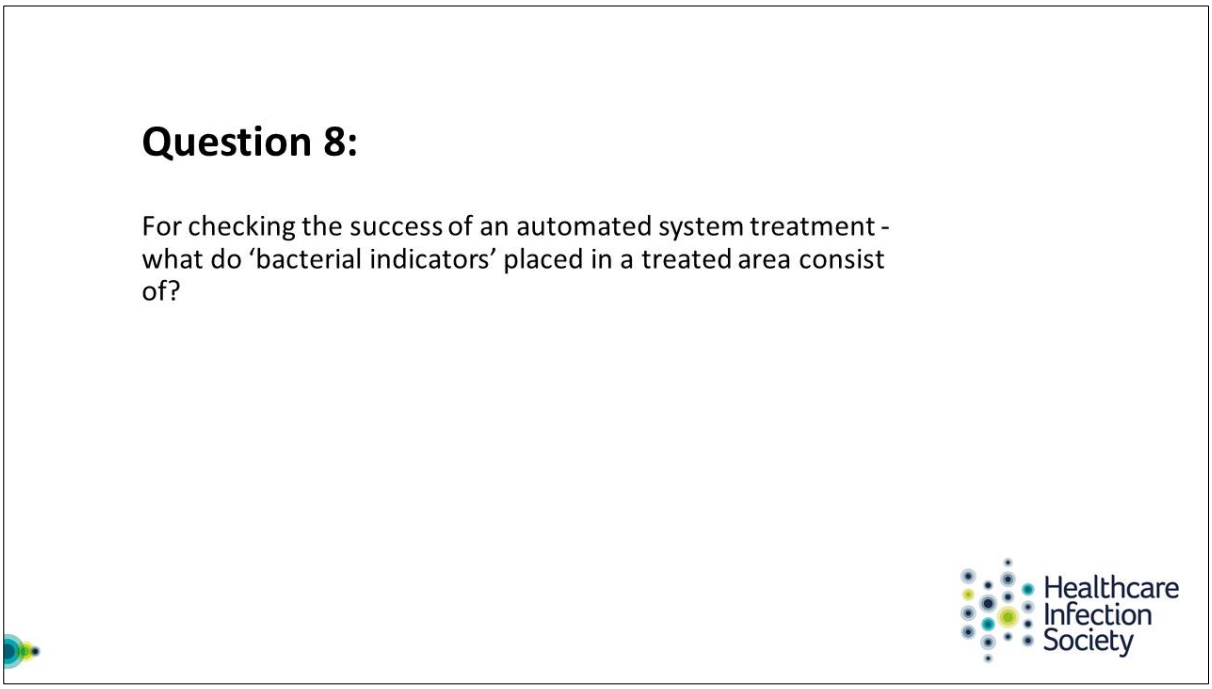
Is that, is that your experience, Claire? Do you manage with bays, OK?

Claire Haill 44:56

Yeah, we've only ever done bays once, to be honest. and that was a mixed ward, were they had three bays with doors and two with open entrances, you know, so they were higher observation. But we linked with our Estates team and they did manage to create you know, a big sort of frame and they heavy duty plastic was actually used, and obviously to seal that around. So we did achieve it, but it did cause a little bit of consternation related to how it was going to be achieved. But yeah, it's doable

Joanna Walker 45:41

Okay, thank you both. Let's move to our final pre-determined question. So Alan I think this is for you.



Alan Beswick 46:04

Okay, well, I mean, in terms of the composition of most commercially purchased indicators, which I'm thinking that's what this question is getting. What we're talking about is usually *Geobacillus stearothermophilus*, which is a very low hazard challenge organism. And historically, it's been used for assessing the performance of steam sterilization equipment has been used for that purpose for a very

long time. It used to be called the *Bacillus stearothermophilus,* it's had its name changed due to some genetics work since then, which has reclassified it. So that we use that a great deal, it's available in order of 10^6 microorganisms either on a small cellulose strip, or on a small steel disc. They're very inexpensive to purchase compared to, compared to, some of the other expenses that are required for this sort of technology. And of course, because they're low hazard, obviously I appreciate the using challenge organisms as a test of efficacy in any kind of clinical environment, there's a there's always a question, because the last thing that you want to be doing is introducing microorganisms into an environment and, you know, the use of these sorts of test organisms may very much be determined by local decision making, the nature of the area that's being treated for example, whether it seemed to be permissible to place challenge organisms within the areas. Now, if you look at the there, there are two British Standards, in fact one of them is a British and European standard testing method for fumigation equipment and UV equipment. The UV has very recently been published; it is a 2022 document. You'll see that actually in order to pass those sorts of tests, the equipment actually has to be going into the wide range of organisms including things like *Pseudomonas* species, *Staphylococcus aureus*, and various kinds of spore forms and also viruses if it is the complete test that needs to be practiced. So there's a difference between making testing the efficacy of a system locally, you know, in a way that's going to be used within a particular setting. And also, you know, when you compare that to maybe what the manufacturer or the supplier has put the equipment through in terms of performance so that they can then use their test data as a promotional element to selling the systems. And that's probably something worth mentioning, that when people are considering purchasing equipment, it may be worth asking the supplier if their systems have actually undergone those tests. It's not the be-all and end-all but it's meant to be a benchmark. Where certainly with the fumigation tests across Europe, it's you know, it's been it's been accepted across Europe that test and it does allow people you know, right across Europe to say okay, well this, this piece of equipment is actually passed a similar test. Because, you know, many pieces of equipment at this time are being sold internationally, not just the kind of you know that they're not necessarily being sold in the UK. So, so yeah, I'm just trying to think whether there's anything else. I mean shelf life is probably something worth considering with these biological indicators to make sure that you know, they do go off as they have a determined shelf life beyond which they shouldn't really be used in terms of quality control. Also worth remembering as well, but certainly for fumigation, it's possible to have chemical indicators which have no microorganisms associated with them at all, but are designed, for example, to change colour when exposed to hydrogen peroxide in the airborne state. So you can certainly see whether the peroxide would reach all of the places that you would hope you would reach with the treated space without necessarily having to put any microorganisms, challenge organisms in that space. I know that there are, if you look very hard there are possibly other challenge bacteria that can be purchased commercially. I think some *Bacillus* species are available. Obviously, both *Geobacillus* and *Bacillus* are of interest because of their spore forming capability. And sometimes those spores are mounted in things like a casein-based soilant and so that makes it slightly more difficult, it stabilises the spores or helps to stabilise them, and maybe makes them slightly more difficult to actually eradicate. But on the whole, the *Geobacillus* spores are not terribly difficult to kill, in our experience some vegetative forms such as *Staph. aureus* can actually be more challenging to kill certain circumstances than *Geobacillus stearothermophilus* spores.

Joanna Walker 50:52

That's interesting. Okay, we've reached the point about moving to the live questions. Have a look and see what's on offer for the first one. **Slido question 1**

Why do you recommend windows should be covered when using UVC disinfection when it is indicated that it does not travel through glass. Thank You.

F Fiona Cooper

Anybody wish to answer this one? Go for it, Alan.

Alan Beswick 51:38

I mean just one comment is that you know, it's always good to be precautionary with any system and it's very easy to hang something opaque over a window to make it absolutely certain that nothing's coming through that glass. Glass differs because you know we done work with double, our test room is actually double glazed, we've actually done evaluations from outside the room with very high intensity UVC equipment and we have detected no transmission, no radiation detected outside of the room. But you know, not every room is double glazed and some glass may be thinner than other glass. There are variations clearly out there and I think maybe it's a precautionary measure. It's probably sensible to consider covering the windows, which I think why it's been mentioned in the guidance document.

Joanna Walker 52:32

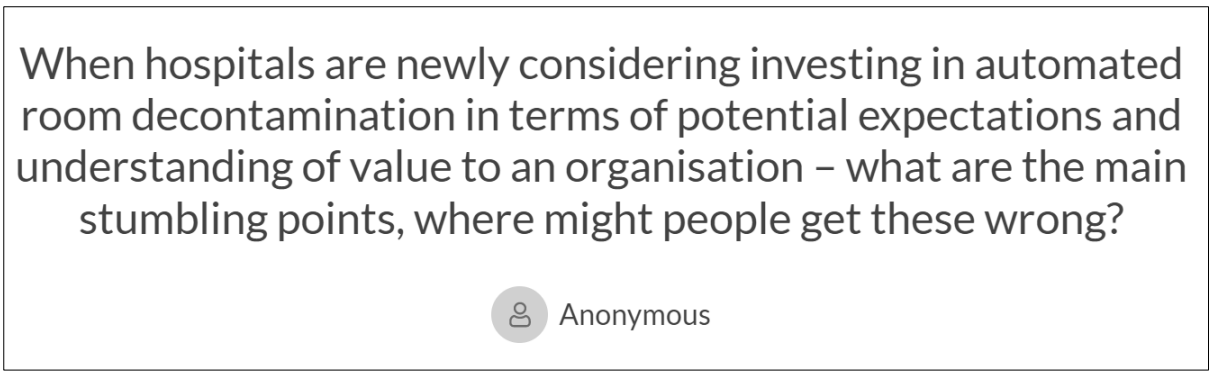
What sort of things would you use, like cardboard or curtains or what could you just instantly put up there?

Alan Beswick 52:40

We put black paper in the past. As a precaution actually, even though we've taken those measurements and you know, everything indicates there is nothing coming through the glass. We've gone one step further and we sometimes use thin board, which is very easy to just stick around with some removable masking tape. It doesn't have to be anything that is going to cause damage and very often, you know, that can be cut out if you want to use board, you know might be someone in the estates that maybe helps with that. But, if you use paper of course anyone could get a pair of scissors and put something on the outside of the window.

Joanna Walker 53:52

Sorry, I was muted, wasn't I? Okay start again. **Slido question 2**



Any thoughts?

Peter Wilson 54:24

It's quite a difficult decision for an organisation to make. Obviously, there is a fair investment of money in getting one of these systems up and running. Do you invest in getting a system do you invest in your cleaners? The decision then is to buy something that's equipment and capital with probably bought in labour or maybe a few trained operatives in your own staff or do you invest in more cleaning staff who may or may not be contracted in and it's really quite a complicated decision, but the potential expectation- Well, it depends on how effective you think this is going to be a hospital acquired infection rate. The number of patients in the hospital with hospital acquired infections around about 6%. Now, you got to be operating your system for a couple of years before you'll see a financially significant improvement in that infection rate, such that the administrators will notice. They may also have the unfortunate argument and it's certainly been directed at me in the past. If we get people with less infections, they'll stay in hospital for less time will then fill that bed more quickly. And we'll actually spend more because we're having more patients coming through the hospital which I must say knocked me right over when I heard it. But this is how the administrators can think so just be very careful when you're trying to weigh up the pros and cons. And bear in mind, you can do a pretty good job by improving the education of the cleaners as well.

Joanna Walker 56:25

Yeah, that's a really important point. I don't know if anybody else has got anything to add to that. Yes, go for it Alan.

Alan Beswick 56:37

I was just remembering back to several years ago, when we were aware of a trust which invested very heavily in a particular type of fumigation equipment, I think about 20 or 30 of them. Obviously, the intention of treating a very wide range of rooms on their estate. I think probably, I mean, that was clearly a huge investment for them. I think the systems were at least 15,000 pounds each. Some are very much more expensive and that's actually booked that that was the particular system at the time.

And I wonder whether when a trustee is preparing to make this sort of investment, whether they can maybe approach it almost like a tiered way, maybe a trial way where you may invest in a certain number of systems, see how things go and then, you know, make your sorts of financial and clinical assessments based on you know six months or a year's usage and then take a step back, look at the results of that and consider the next steps. I mean, I'm not based in the hospital and I used to be a staff nurse in a previous life and have worked in a hospital environment where it's just, you know, a huge investment like 20 or 30 systems versus maybe just a more tiered approach, taking stock of what can be done in making a particular area of need, and then taking further decisions about further purchases might just be one way to go about it anyway. Just the thought really.

Joanna Walker 58:09
Mark, you've got your hand up?

Mark Garvey 58:11

Yeah, I think it is a good point and it's a really it's a tricky one, as Peter and Alan mentioned, really so, I'll talk about from my experience.

So, I suppose the new kid on the block from a decontamination perspective, obviously UV was an interesting one and we've got mixed system, we've got hydrogen peroxide in - and then we've built business cases around that.

But to get UV in and for example the different technology, was very much on trial basis to get in. There's lots of evidence coming out, and you got Dev Anderson's work – the Lancet's paper was very keen to implement it, and then from a practical point of view, and how we did that was we got one or two machines in.

It is very difficult, as Peter said, to see a difference, but we saw differences particularly with our VRE numbers in our critical care and haemotology. VRE in critical care and a predominance of side rooms it made a big difference in that, and we progressively purchase more machines over time.

It is right and is a tricky thing from a capital point of view. They're expensive pieces of kit and how we've tackled it (we are one of the biggest if not the biggest Trust in the country) we're set up in divisions and now we get like the divisions to purchase those when they're in certain areas and that's how we've approached it.

So we're very much like, we build up the UV from one machine. It's built up to 5,6, 7 from a trial point, point of view as well. So I think that's how we got an established baseline of what we do, what we've done from evidence, we're lucky you know that we've got a hospital infection research lab, where we've done little bit of research to prove the point in principle and then move moved into that so you know, we're nowhere near having enough UV machines in the hospital and training staff to do that, because obviously, you can get loads of UV machines. But then you look at the training elements, how we sell some of the things to the divisions in the wards is around you know a little bit of helping flow in that currency at the moment, obviously, yes, preventing infections is a key thing and the money and as Peter said people throw curveballs you know, how we solve the UV is up to speed of that to help flow through that. So it's a tricky, tricky thing and that's how we've done it for UV and it probably looks slightly different - people can use our experiences.

Joanna Walker 1:01:08

Oh, that's all we have time for now. So, thank you everyone for joining the webinar and thank you very much to Mark, Claire, Alan and Peter for sharing your thoughts and your experiences - really valuable. Thank you very much to our HIS production team. I wish everyone a good evening and hope you're able to join us for future webinars and remember the recording of this webinar will be available soon on the HIS website. So thanks very much and goodbye.
