Transcript: Webinar – Spotlight on guidelines: Final rinse water for endoscope washer-disinfectors

30 March 2022

Watch the webinar

During this webinar you our expert panel answered questions on the final rinse water quality for flexible endoscopy to minimise the risk of post-endoscopic infection.

- **Jimmy Walker**, Central Sterilising Club, UK
- **Craig Williams**, University Hospitals of Morecambe Bay
- **Wayne Spencer**, Spencer Nickson Ltd
- **Leila White**, Lancashire Teaching Hospitals NHS Foundation Trust & Royal Preston Hospital

Chair: **Surabhi Taori,** NHS Lothian, Scotland

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Surabhi Taori 0:06

Thank you all for joining today's edition of our spotlight on guidelines webinar series. My name is Surabhi Taori. I'm a consultant microbiologist and infection control doctor at NHS Lothian in Scotland. And it's my privilege to chair the session today.

Surabhi Taori 0:22

Today's webinar is called Final Rinse Water for Endoscope Washer Disinfectors. Quite a mouthful. This is also a very niche area of infection control. But we have today an elite panel to bring with them a variety of experiences on the subject, and all of whom have been involved in writing the guidelines just published in the Journal of Hospital Infection.

Surabhi Taori 0:44

Without further ado, I invite the panel members to introduce themselves. Ladies first so Leila White from Lancashire Teaching Hospitals.

Leila White 0:54

Hi, everyone. My name is Leila White. I'm a clinical scientist on the High Specialist Training program in my final year, and I'm on from Lancashire Teaching Hospitals Foundation Trust.

Surabhi Taori 1:11

Thank you, Leila. Jimmy Walker from the Central Sterilizing Club.

Jimmy Walker 1:17

Thank you very much Surabhi. Dr. Jimmy Walker from Central Sterilizing Club, the current chair. And I'm very grateful to be involved in the guidance of the former microbiologist with Public Health England for over 20 years and very interested in the water aspects and biofilm aspects of what we're doing today. So thank you.

Surabhi Taori 1:35

Thank you, Jimmy, and Craig Williams from University Hospitals of Morecambe Bay.

Craig Williams 1:35

Hi, everybody, I'm a consultant microbiologist working in Lancaster. My interests are basically in infection control, but I've also got research interests in biofilms and persistent organisms.

Surabhi Taori 1:53

Thank you, Craig. And last but not least, Wayne Spencer from Spencer Nixon Limited.

Wayne Spencer 1:58

Hi, everybody. My name is Wayne Spencer. I'm an independent authorizing engineer. I advise NHS Trusts on decontamination issues and specialize in endoscopy processes and water treatment.

Surabhi Taori 2:15

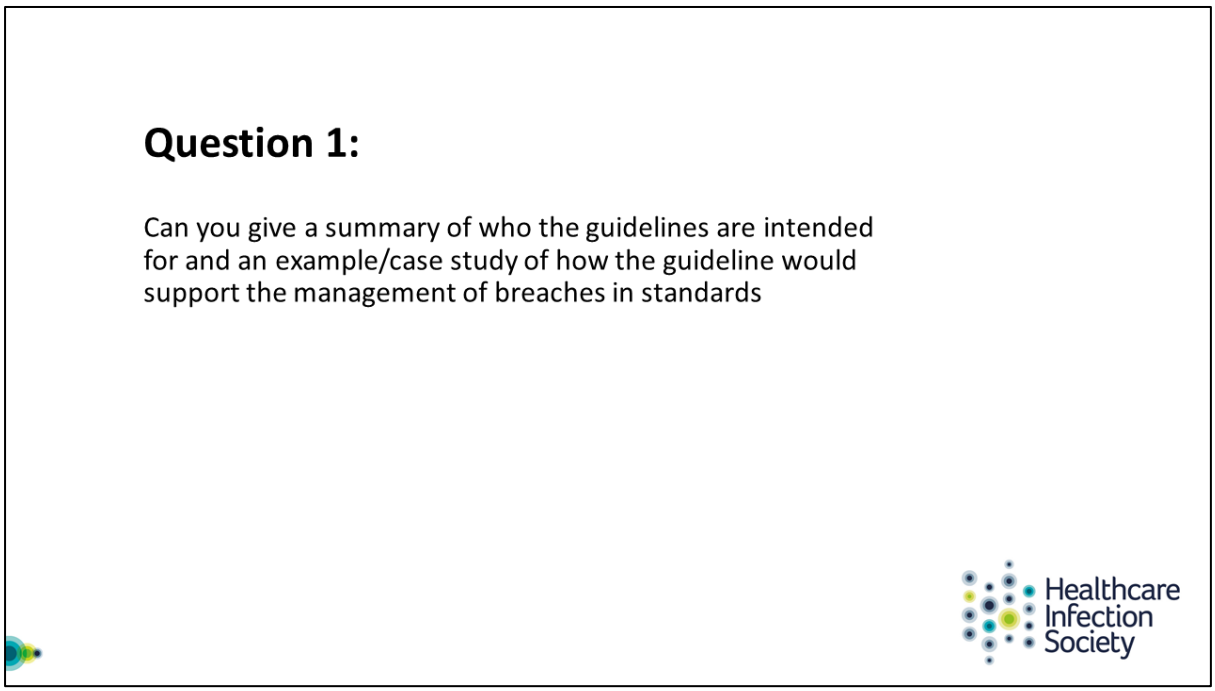
Thank you, panellists. Audience, as you can see, we're headed for an engaging discussion. Just before we start, as usual before the webinar, we asked viewers to submit questions to put to the panel. Of these we've selected some of the most popular questions for the panel to discuss during the first 40 minutes or so of the webinar. After that, the panel will answer live questions which you can submit via Slido. We also have live polls today, which you can vote on using the Slido app. To participate in polls and questions please open the Slido app and enter the code. #HIS.

Surabhi Taori 2:55

So without further ado, let's go to question number one.

Surabhi Taori 3:13

Can you give a summary of who the guidelines are intended for? And an example or a case study of how the guideline would support the management of breaches in standards?



Surabhi Taori 3:25

Can I invite Jimmy to answer this question?

Jimmy Walker 3:28

Thank you very much Surabhi. Yes, who is the guidance intended for? The guidance, obviously, relates to provision of satisfactory rinse water for endoscopy. And what basically the guidance allows staff to do is to make practical recommendations on the actions that are required and response to the contamination. And who is it actually relevant to is obviously going to be to a wide range of staff seeking to interpret those final rinse water results. Staff, including Wayne, for example, at the engineering staff and authorized engineers, the staff undertaking the sampling, you need to understand how to do that appropriately. And obviously the endoscopy staff who walk into departments, and I think that includes all of them who have an interest in that including the specialists and clinicians. But also then you've got the water microbiologist, similar to Craig and myself and the medical microbiology then have to take action and decision based on the results from the safety of the patients. And obviously, we have the infection control specialists who are involved in that, setting that process as well at the end of the day to ensure that the water is of a safe level in terms of contamination.

Jimmy Walker 4:31

You then asked about some case studies and obviously you've got a situation where we have the counts of the final rinse water. And you're sort of, we are looking at the counts between one and nine as we just continue to monitor those. We've got counts between 10 and under 100. Then you'd looking at undertaking a self- disinfection, and quite often you're getting counts, which will be less than 10. And sometimes you will get a spike greater than a 100 and that's where you need to start investigating what's going on. And maybe a case, for example, that someone's actually gone on holiday, a person who does sampling has gone on holiday. And you've got someone else taking the sampling that week. They're not used to doing that type of sampling so much. And then you may have situations where you'll have over 100, and you may, for example, detect Pseudomonas or Mycobacteria in your quarterly testing, in which case, you would have to stop using that processor, and investigate and rectify the situation.

Surabhi Taori 5:33

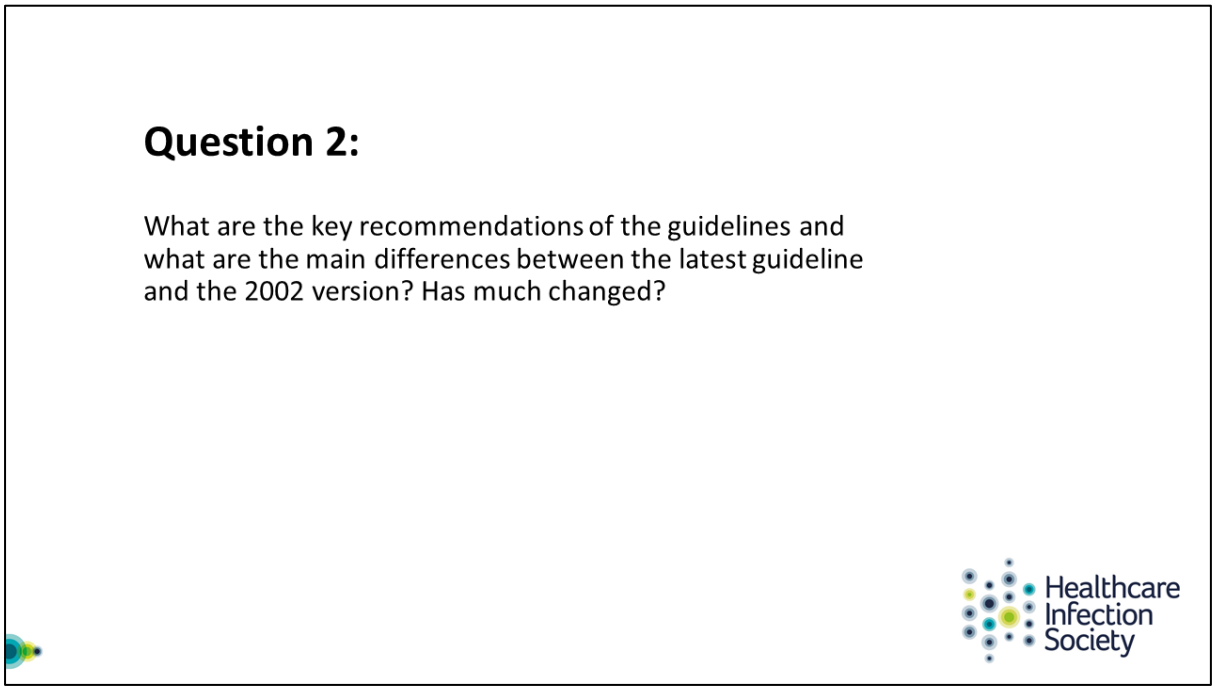
Thank you, Jimmy. It does sound like it'll be used by at least a number of people working in infection control. Any of the other panellists like to add anything?

Surabhi Taori 5:48

No, shall we go on to the next question then?

Surabhi Taori 6:04

So question two for today: What are the key recommendations of the guidelines? And what are the main differences between the latest guideline and the previous, which is the 2002 version? And has much changed?



Surabhi Taori 6:19

Can I invite Leila, please, to answer this?

Leila White 6:23

Oh yes, there's actually quite a few guide… recommendations in the new guidance, seven evidence-based recommendations and 19 expert-based. So we've not really got time to go through them all today.

Leila White 6:37

But I think the one of the main factors is that since the previous guidelines in 2002, there's been quite a lot of newer guidance around the area that's helped inform how our practice and some… some HTM guidance and Scottish and Welsh guidance and also the British Standards have allowed for standardization of the testing methods. So one of the recommendations is to follow these British Standards for the testing methodology. Whereas previously, the methodology was, was described in the annex of the guidance. So this allows for standardization across the board. In addition, one of the big changes is the recommendation to carry out the TVC, testing weekly, and then carry out the specific organism testing for Pseudomonas and environmental Mycobacteria on a quarterly basis. And the original guidance in 2002 would have mentioned doing weekly TVC testing.

Leila White 7:41

But then, so acknowledged, this might be quite difficult for some, some places and therefore highlighted that, that could be monitored locally, for example, and didn't go into any sort of specific organism-related testing.

Leila White 7:56

So that's quite a big change. And then in addition, they do… they did mention trending and keeping a record of the data and trending that over time to look for any increases. The suggestion previously, was that if the, if the counts stayed low, and the departments were happy, then this, they could move to maybe quarterly water testing. And so the guidance now actually says, you know, this is recommended, we should be ideally going for weekly testing of the TVCs and quarterly, and that's to ensure that we can keep on top of any potential problems that might arise.

Leila White 8:37

So in this guidance, as well as the changes in the interpretation, so there's the… it's now split into… In the previous guidance, there was, essentially, no… they wanted it to be no bacteria, or it was sterile rinse water that you used, whereas now it's recognized that that's quite a challenge. So there's different cut-offs as sort of the green, yellow and the red cut-offs. And they… they relate to specific actions, as mentioned briefly by Jimmy.

Leila White 9:10

And so that's… that goes into more details. And there's actually a bit more detail in how to manage the results. And then sort of what the actions are relating to that. And so that's quite useful for departments as well, which is, in addition to previous guidance, and there's a few different things that I've mentioned, one of them is the fact that there's… a there's a recommendation relating to looking into potential contamination following the rinse water stage, and where the scopes are maybe drying and storing just taking into account that this is a potential area for… for additional contamination. And also the recommendation that even if there's a breach, a red breach where there'll be greater than 100cfu per 100ml or a highly pathogenic organism… Sorry, or a significant organism found and there is no sort of routine trace and follow-up of patients recommended. So that's sort of one of the… one of the bigger recommendations this time. So I think that they were the sort of main ones highlighted. Obviously, we could talk for the whole entire hour about… about all the different recommendations, but I don't know if anybody else has got anything extra that they wanted to highlight from some recommendations.

Wayne Spencer 10:34

I would just like to add, Leila, that obviously one of the things that has changed in the 18 odd years since the last guidance is the emergence of molecular techniques that weren't around when we wrote the original guidance. So I think obviously is the other thing is that we now reference those techniques as well.

Surabhi Taori 10:56

Thank you, anybody else?

Surabhi Taori 11:01

If not, we have a poll for you.

Surabhi Taori 11:04

In the audience…

Surabhi Taori 11:11

The question is how often do you carry out final rinse water and microbiology TVC testing?

Surabhi Taori 11:18

Never.

Weekly.

Quarterly.

Only when a problem is identified, or maintenance work takes place.

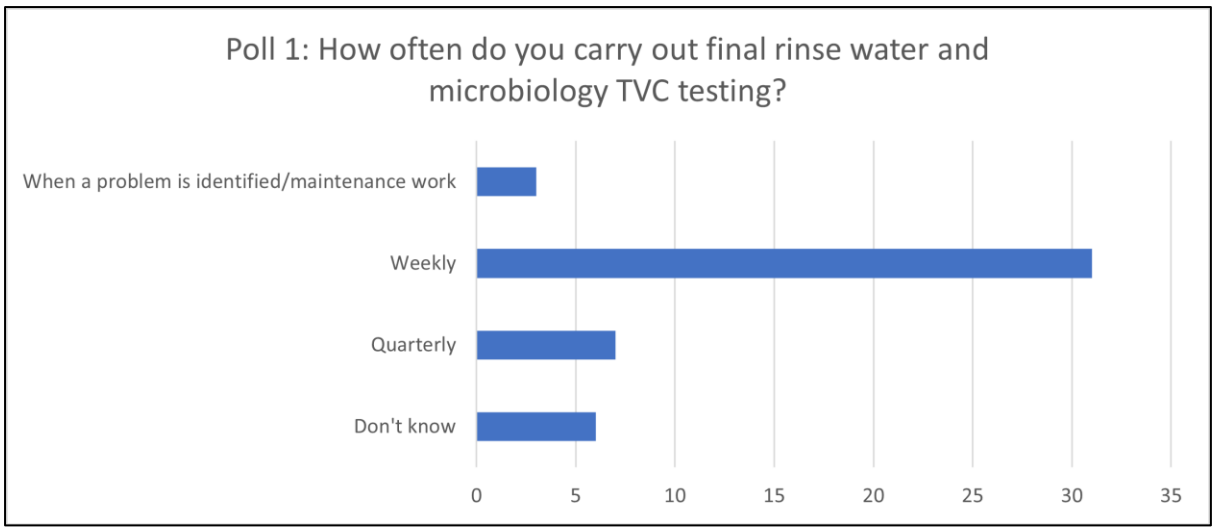
I don't know.

Surabhi Taori 11:31

Please use your Slido apps.

Surabhi Taori 11:50

Okay, so…



Surabhi Taori 11:52

Quite a few people don't know.

Surabhi Taori 11:55

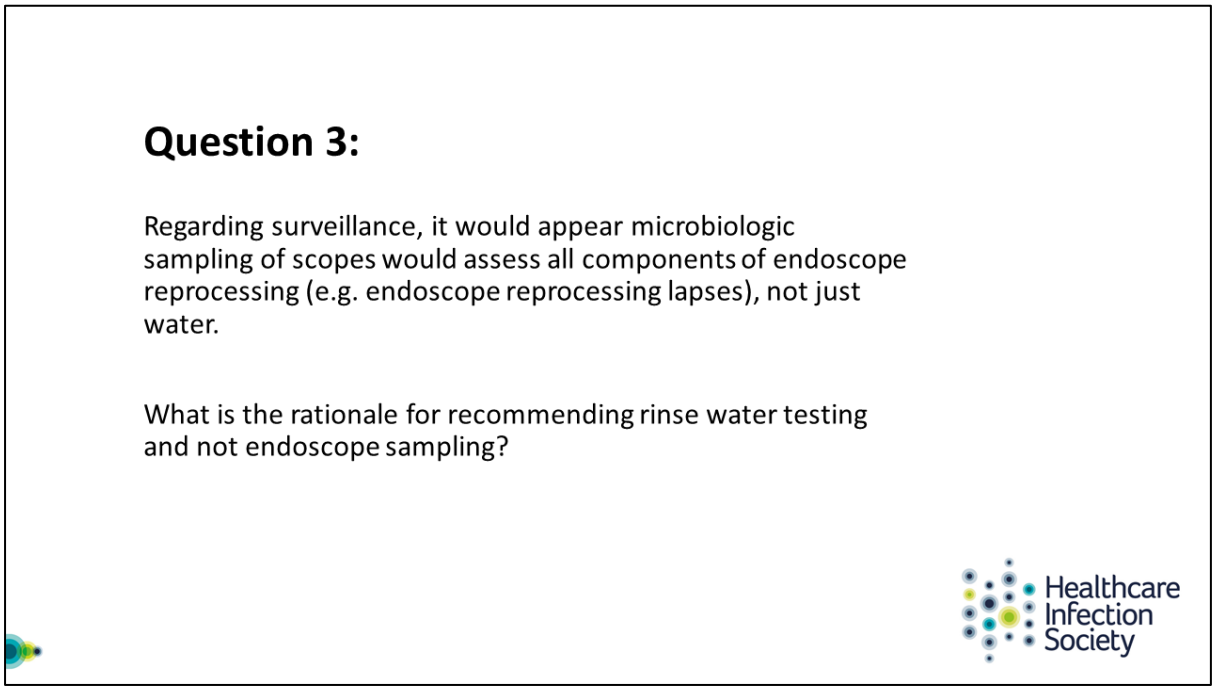
But the majority do weekly testing, which is pretty much what the guidance recommends. Great.

Surabhi Taori 12:02

Shall we go to the next question?

Surabhi Taori 12:25

Question three is regarding surveillance. It would appear that microbiological sampling scopes would assess all components of endoscope pre-processing and example and just process reprocessing lapses, not just water. What is the rationale for recommending rinse water testing and not direct endoscope sampling?



Surabhi Taori 12:51

Can I invite Craig? Craig, would you like to tackle this one?

Craig Williams 12:54

Yeah, thanks very much. So there was two broad areas for the rationale behind this recommendation. The first is standardization. So there's in different guidance, there's a number of different ways of processing samples from endoscopes, in different volumes, different media, the interpretation of results is actually that much more tricky. And it's actually also quite a fiddly thing to do. You've got to kind of instil things down the channels, and to catch things in sterilerequires a lot of training. So the main reason is kind of pragmatism, there are already established standards for rinse water testing, people are used to doing it, and it seems to give results. The other thing we were content, looking at all the data, that basically the washer disinfectors are doing a good job. So what we're trying to do is to control the washer disinfectors as much as the endoscope cleaning. So it's.. it's… we're for the rinse water testing, we're actually testing the process, which again ties in with the weekly testing. So we've got a quality assurance process and a standardized process. And that was the reason why we went for, for that rationale for testing.

Surabhi Taori 14:00

Thank you, Craig, anyone else has a view on this?

Surabhi Taori 14:06

It makes me wonder there's also quite a bit of variation in the different types of endoscopes, isn't it? And that probably plays a role on… very hard to standardize the process.

Craig Williams 14:16

Yeah, absolutely. And different manufacturers have slightly different recommendations, the ends flip off on some, don't flip off others. Things like that. So you'd have ended up with a kind of a big appendix, I think, if we'd have gone into individual endoscope testing. I mean, you know, theoretically it's a reasonable thing to do. But not really what's possible and pragmatic as well as what's feasible.

Surabhi Taori 14:35

Indeed.

Wayne Spencer 14:39

Surabhi, could I just add… add on that as well?

Surabhi Taori 14:41

Yes, of course.

Wayne Spencer 14:43

That has come out of France, where they do a lot of endoscope testing and they have done a lot of endoscope testing previously, is that very often the problems with the endoscopes mask the problems with the rinse water because you don't actually know where the problem is coming from in some cases, and very often you end up with a contaminated endoscope. That's actually making… making you look at your rinse water when there's nothing wrong with your rinse water. And the other thing that came out of that work in France was the difficulty in getting the standardized sampling technique. And what sample media do you actually use? And all those things end up giving you different results. So I think, backing up what Craig said that it all points to, you know, having a standardized approach is much better.

Surabhi Taori 15:26

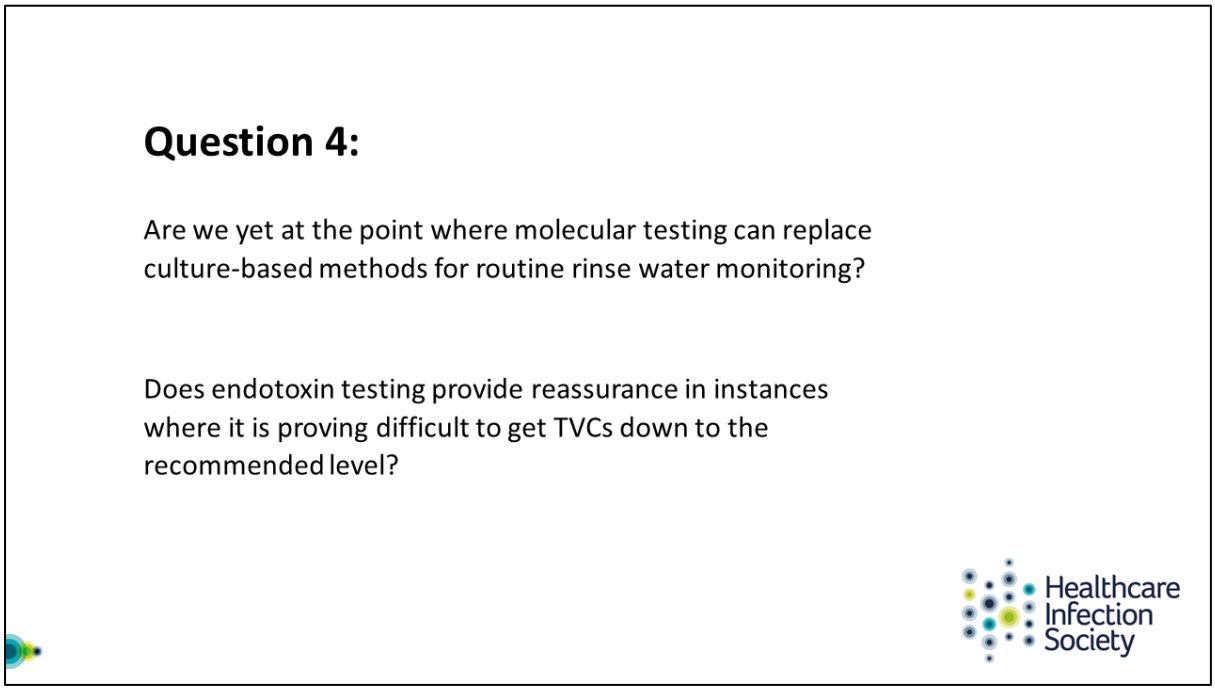
Absolutely.

Surabhi Taori 15:29

Shall we go to the next question?

Surabhi Taori 15:44

So question four: Are we yet at the point where molecular testing can replace culture based methods for routine rinse water monitoring? And related to that: Does endotoxin testing provide reassurance in instances where it's proving difficult to get TVCs down to the recommended level?



Surabhi Taori 16:05

Now… Maybe I can invite Wayne to answer this.

Wayne Spencer 16:08

Okay, thank you, Surabhi. Yeah, this is… this is really interesting, because this is almost a moving target constantly, you know, week by week, we're seeing different techniques emerging. We're seeing technology play a part in improving methods. But I think yet, we're not quite at that stage where we could say, well, you can, you can get rid of plate-based methods for your standard water testing, we obviously need something that's quite broad-brush when we're doing weekly rinse water tests, we need something that can pick up a whole range of different organisms, and so on. So we're not at that stage yet, I think where we can use molecular methods routinely for a wide range of cell types like we get with a plate count. However, where this is progressing quite rapidly is when we're looking for specific organisms, such as environmental mycobacteria, for instance, where we traditionally have a Middlebrook agar plate test, which takes us 28 days to get a result, by the time we get a result, the rinse water has changed substantially in terms of what it probably looked like 28 days ago. And I think, certainly when we're commissioning new machines now, installing new endoscope washers, we're using PCR-type tests, which is one molecular method, which is quite… getting quite common now. And we can have those machines into service in a lot shorter timescale. Even if we don't then use the environmental mycobacteria PCR tests for routine monitoring, we can use it for commissioning and validation to give us a much quicker indication of the quality of the

water. The endo… the endotoxin one is interesting, because the opinion of the study, when we looked at the evidence around endotoxin testing, there wasn't a huge amount of papers that presented any benefit to do it routinely. And in fact, the guidance in Wales and England and Scotland seems to suggest that you don't need to do routine endotoxin testing unless you've actually got a problem. I think one of the… if you try and rely on endotoxin testing, you end up with an issue where you're primarily looking at Gram-negative organisms, and you're missing out the potential for Gram-positive. So I think by… by doing a standard plate test and getting that broad-brush, and then if you have a problem, then maybe use endotoxin testing to perhaps help you with… with… with… with that problem further down the stream. And certainly if I had ongoing problems that were lasting a while with high TVC counts, I may want to look at endotoxin testing as well, just to see if I'm… if I'm getting a huge amount of… of endotoxin within my rinse water and where it was coming from. So it does have its uses, but I wouldn't say it's there to assist particularly with a TVC test.

Surabhi Taori 19:09

Okay, good. Jimmy, would you like to add something?

Jimmy Walker 19:12

Yeah, it's just to say thank Wayne very much for answering all that. Clears up a lot of things, particularly about, you know, why we're using, why we want to use molecular testing which is so wedded to traditional either plate-cultured agar, or the liquid media. And it's just, you know, even for Legionella, it's taking two weeks to get a result back in the lab. And this is about patient safety, it's about safeguarding patients and assuring they're not at risk. And so if we can move on to better technologies, and certainly I think we should be encouraging that.

Craig Williams 19:46

I'll just add as well. I think the recent experience of COVID-19 might make a little bit of difference because a lot of routine diagnostic labs are now much better kitted out in terms of molecular technologies than they were previously. So I think you know, over the last 18 months things have moved on. And this is an area I think, as Wayne said is, is kind of ripe for a further look.

Surabhi Taori 20:06

Indeed. Anyone else? Would like to add? Their experience, perhaps?

Leila White 20:12

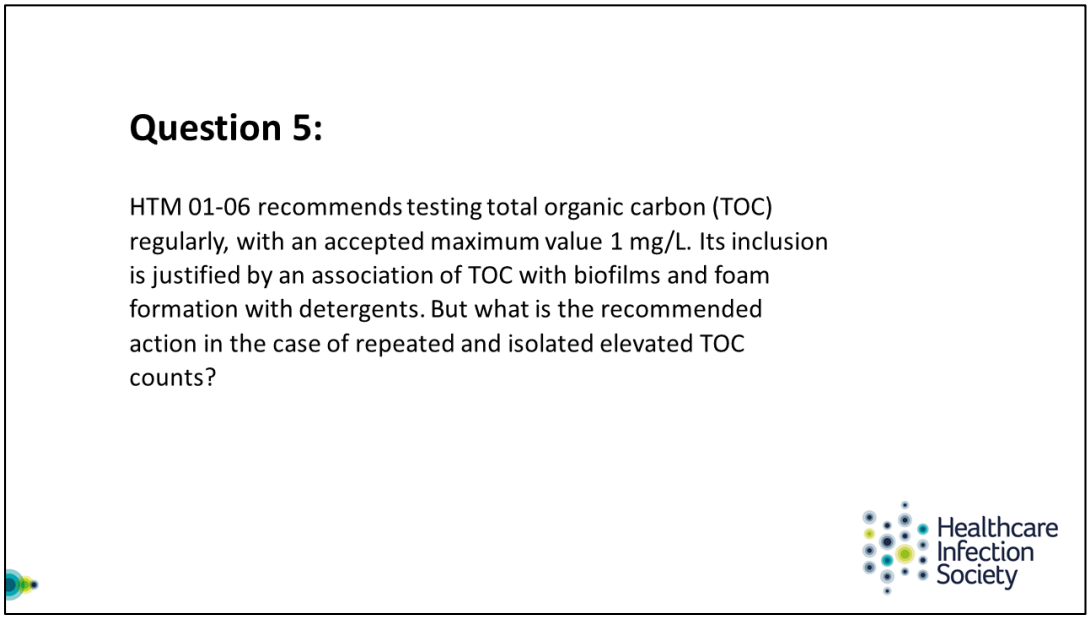
I think I'd just like to add, I suppose, one of the other sort of problems or issues with moving forward with it with the TVC is the fact that molecular testing can pick up the, like the dead bacteria as well. So, with regard to TVC being a total viable count, then that's something that has to be, I guess, taken into account as well, because the molecular testing, if you managed to do broad-brush testing, you could potentially be picking up something that wouldn't necessarily have grown on the TVC. So that's just something that moving forward when we're looking into the different technologies to be aware of.

Surabhi Taori 20:50

Thank you, Leila. Thank you, everyone. And moving on to the next question. Question number five.

Surabhi Taori 21:04

So the HTM 01-06 recommends testing Total Organic Carbon, TOC, regularly with an accepted maximum value of 1mg/L. Its inclusion is justified by an association of TOC with biofilms and foam formation with detergents. But what is the recommended action in the case of repeated and isolated, elevated TOC counts?



Surabhi Taori 21:30

Can I invite Wayne please to have… Anything to share with us?

Wayne Spencer 21:34

Yeah, I think this is the question nobody really wants to… to answer or discuss. But it's interesting that I probably see next to TVC failure results, I probably see more TOC failures than any other value that we test for when we when we look at washer-disinfector rinse water. And, and to be honest, it causes nightmares, because the threshold of a pass within the HTM documents is… is really quite low. And it's not unusual to get routine results between anywhere between one and five, or even a nine in some cases. And specifically as machines age and we get… the residuals. I totally understand the reasons why we might want to put it in because it will give us some indication of biofilm formation to a certain extent but… but when you start off with a brand new machine with the TOC that's already above the HTM pass threshold, you're sort of saying to yourself, well, well, where do I go from there? If I'm already not passing with the new machine. I think when I start to get prolonged failures with TOCs and heading towards the eight or nine level, then… then I start to get a bit concerned. If I'm getting 1.1s or 1.2s, then I don't think it's such… it's such an issue for me.

Wayne Spencer 22:58

But certainly as that increases over time I get… I get started to take a stronger look. And… and there are other things you have to rule out… more than, you know, to be able to investigate. You sort of have to test those other things. And one of the things I always look at when I get a failure in TOCs is whether the TVC results are okay, whether they've changed detergents, whether they they're using a different… chemical mix to what they were using before that. That itself might include some elements that… that might raise the TOC or whether the detergent dosing has changed significantly on the machine. These are all things I think you need to look at before you start panicking about it being necessarily biofilm formation. But I think if you can rule those out, and it's still increasing, then you start needing to look at maybe doing something to do some biofilm removal on… on some of the components and so on. But to be honest, I very often see trends that go to one, four, five, and then back down again, with a subsequent rinse water test. They're very often there isn't the pattern, because the other thing that also falls into this is that the quality the incoming water will also affect the level of TOC in the rinse water. Even with RO, where people presume RO is an absolute system, it's not. It's a ratio reduction system. So if you've got high levels of anything in an ar… in a feedwater to an RO, you might get carried over into that RO water because it's typically got a 70 to 90% rejection ratio. So it could well be that the incoming rinse water the incoming raw water before you look at anything else.

Surabhi Taori 24:38

There's so many caveats to everything.

Surabhi Taori 24:40

There is for TOC.

Surabhi Taori 24:43

Would anyone else would like to add from their experience?

Jimmy Walker 24:47

So, Surabhi. Again, I think that's a super answer by Wayne. And it's for me, it's about using each of these tests like a toolkit, and not just in isolation. And Wayne gave some good examples if, you know, if you're if you're getting high TOCs and you're getting high TVCs, total viable counts, you would then start to investigate the system. And where in the water system, and where's that come from what's giving you the Total Organic Carbon results. And that could mean going either, as Wayne mentioned actually going back to the supply water, or looking at the water tank supplying the endoscopy unit. When was the last time that was serviced? When's the last time that filter was changed? It's just basically getting a handle on the water system ensuring that it's well maintained and serviced.

Surabhi Taori 25:33

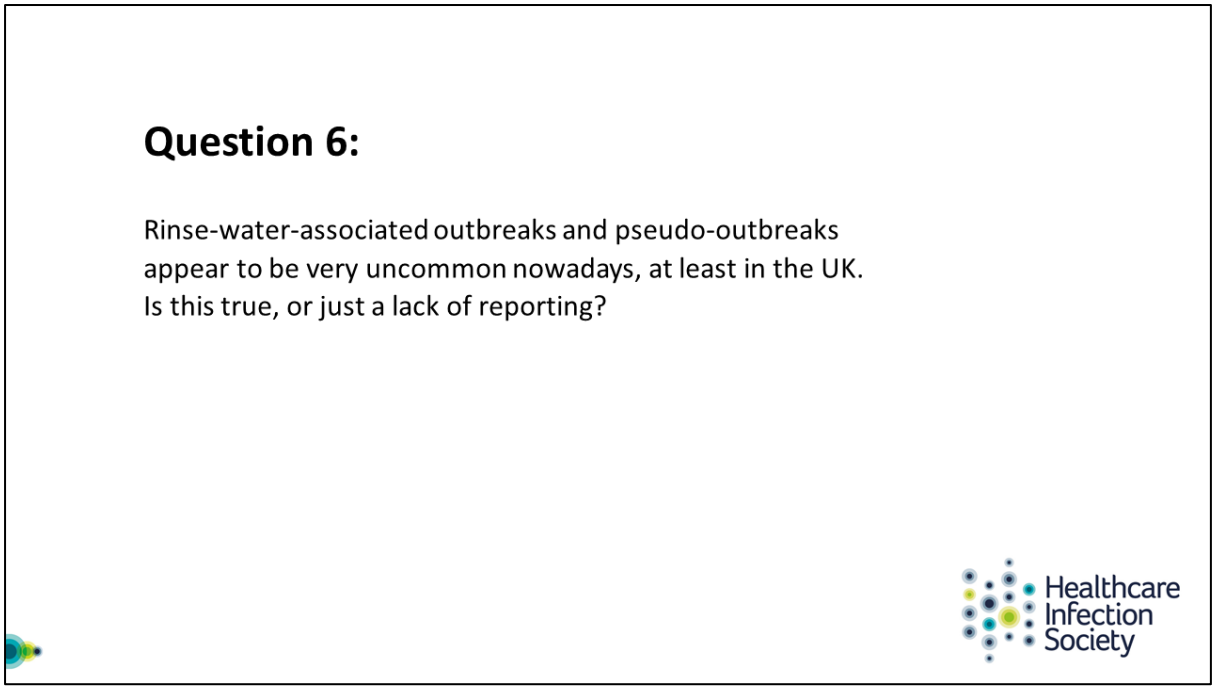
Thank you both. I have just been asked to remind that the questions to the to the panellists by delegates should be through the Slido app and not via Zoom. The polling is through Zoom, but the questions for delegates should be through the Slido app.

Surabhi Taori 25:52

Okay, so next question.

Surabhi Taori 26:08

Rinse-water associated outbreaks and pseudo-outbreaks appear to be very uncommon nowadays, at least in the UK. Is this true? Or just a lack of reporting?



Surabhi Taori 26:20

Leila? Can I invite you to answer this?

Leila White 26:24

Yes, thank you. I mean, this is the key question, isn't it? Really? How can we ever know for sure? It looks like in the evidence that we've been…, you know, we've looked through for the guidance that actually, since the previous guidelines from 2002, there haven't been any reported outbreaks or pseudo-outbreaks in the literature within the UK. And I think there's only been one internationally that actually specifically being the rinse water. And so where it was thought that that is possibly due to the improved standards, you know, the continued monitoring of the rinse water, a lot of people

have been monitoring it regularly for a long period of time. And that that means that actions actually taken and before these organisms reached the unsafe levels that might then cause an outbreak. And so it does look like there are, you know, if that's true, that there aren't actually the outbreaks happening, and that they are quite uncommon. But, on the other hand, how do we actually know? You know, if people aren't going to report them? And they're not going to be published? Then how are we supposed to include that in the guidance? And how do we really know what's actually happening? So we can only really report on what is published. And so at the moment, you know, I think from…, from what we could say, the… the improved guidance, and the standards that have been put in, throughout the years have, you know, have led to an improvement in the… the quality of the rinse water, and the reduction in outbreaks. And this also highlights how important it is to continue with this weekly TVC monitoring, and a specific organism monitoring, it allows the prompt action to be taken if the rising levels are found. And then, you know, hopefully that that is leading to reduced amounts of outbreaks. I think the…, the other thing, I guess, is the… the departments themselves actually recognizing outbreaks. So its whether or not they're reported in the literature, but also, you know, are they linking patients that having the same organism and being able to type them to link them as an outbreak, or are they being able to link and, you know, link the organisms that are found in the rinse water. So it's one whether or not they're published, and then two whether or not they're actually being recognized in the first place, there might be going unrecognized at all. So, I think overall, we'd like to think that they're uncommon, but I think we're not actually 100% sure. I don't know if anybody else has got anything that they would like to add to that.

Craig Williams 28:55

This is just very briefly. There… there is potentially a way to monitor it more closely in Scotland. We did have a look when I was doing some work with HPS. That's because of the electronic systems, which capture all the laboratory results into HPS. And you also get from national services the list about what you are doing in endoscopy. So you can look for people who have new bugs within seven days of having an endoscopy. There didn't seem to be any signal on that. But as I say.. it's a quick and dirty look, it never escaped from HPS. But I mean, if we wanted an ongoing automated surveillance system, something like that actually might be worth revisiting, because as Leila said, you know. It's the unknown unknowns, isn't it, we're all concerned about? And also the publication thresholds. I'd be interested to talk to one of the editors of the journals whether they'd actually publish anything anymore about an outbreak. It's like oh no, this is not novel enough, so you've got the publication bias as well as people not bothering to write them up because it's not publishable thing. So there is quite a lot of variability in what we actually know about it.

Surabhi Taori 29:59

Oh, wow. That makes me wonder, are endoscope-associated outbreaks rare as well? Or is it just those associated with washer-disinfector water?

Craig Williams 30:12

I think they're all pretty rare to be honest. I mean, it's, I think there's, I mean, the review in, I think there are about nine globally reported endoscope-associated outbreaks, and of which there was

fault with the reprocessing and another seven which there weren't and so it's, it is, it's pretty uncommon but I don't know whether Jimmy wants to add anything to that?

Jimmy Walker 30:34

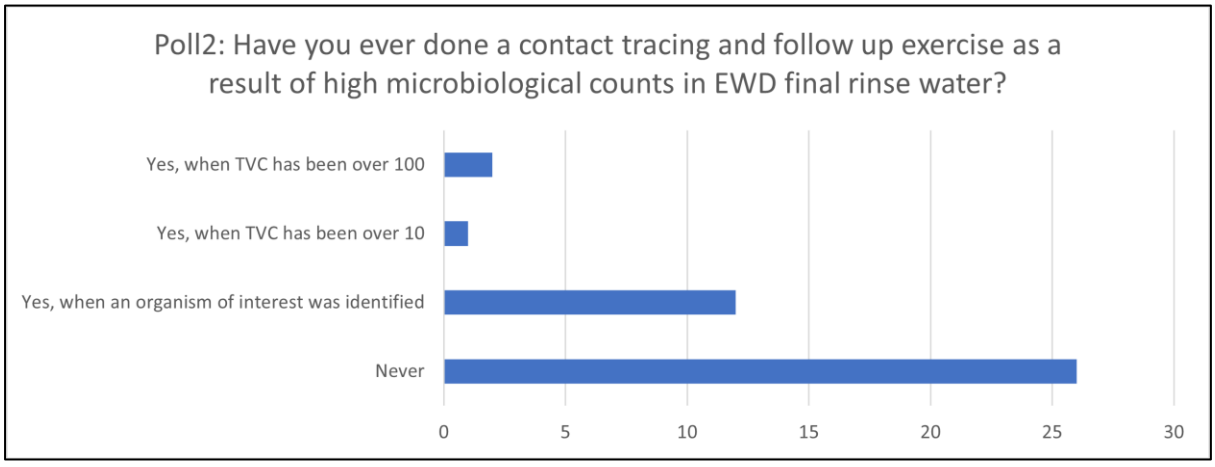
Only in that David Jenkins very kindly presented some work in the last CSC study day based on an outbreak of endoscopy, endoscopes. So it's pretty interesting, that sort of brought home a) that there's still an issue when endoscopes become contaminated rather than the rinse water. And also relating back to the earlier conversations about processes and how to sample the endoscopes, they didn't know where to start. They basically just put some small brushes down their channels and pulled it out into a Petri dish, and added some water, and diluant and plated it out. So yeah, it really is quite, I think disconcerting for departments when they do get a problem. They've got to sample the scopes because they can't Craig you were saying that even different manufacturers of different types of scopes and different components and parts of the scopes can get contaminated and sampling those can be an issue.

Surabhi Taori 31:28

Anybody else with experience on this matter? No. So I think the next is a poll question for the audience. So the question is, have you ever done a contact-tracing and follow-up exercise as a result of high microbiological counts in the endoscope washer-disinfector final rinse water and your options are: yes, when the TVC has been over 100; or yes when TVC has been over 10; or yes when an organism of interest was identified; or never.

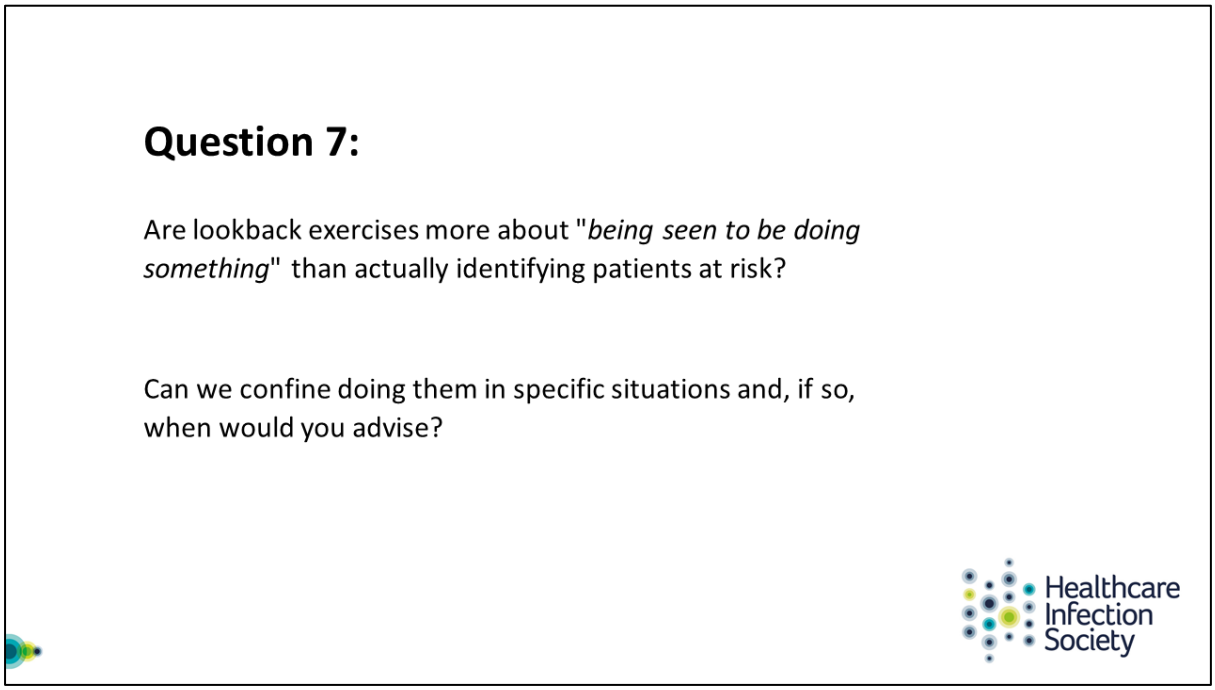
Surabhi Taori 32:44

Oh, wow, the majority have never done a contract-tracing exercise whereas 7% have, oh no more than that, 7% as a reaction to TVCs but approximately 30% when an organism of interest was identified. Very interesting. That brings us to the next question. Question number seven.



Surabhi Taori 33:19

Okay, are lookback exercises more about being seen to be doing something than actually identifying patients at risk? And can we confine doing these lookback exercises in specific situations? And if so, when would you advise? Can I ask Craig to delve into this?



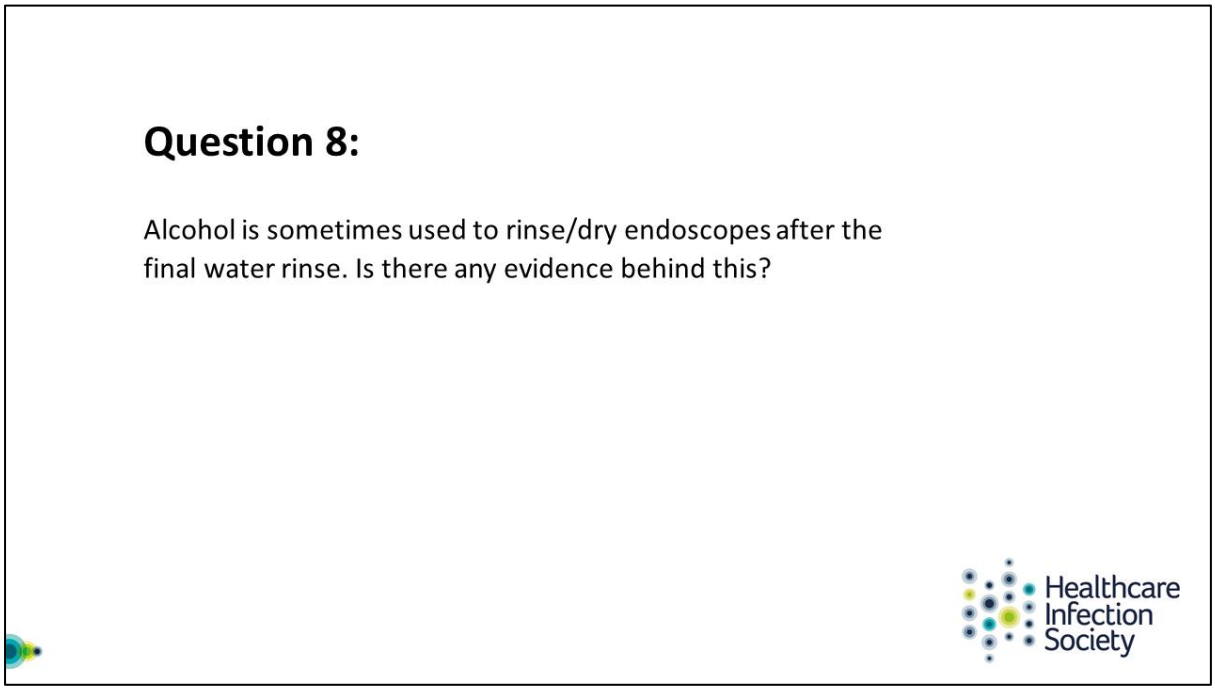
Craig Williams 33:47

Yeah, thank you very much for this one. This is, this is the kind of tricky one that we solved at the end of the, the guidance. So if you read the guidance, we've actually made a statement that we've, we've tried to move away from lookback exercises. And there's a number of reasons for that. The first is that we think that given all the caveats previously, that endoscope-related infections are rare. I mean, the magic 1 in 1.8 million that was quoted in the literature from about 2015 is probably a bit of a kind of an underestimate, but not a massive underestimate. So they're not very common. The second thing is, I mean, how do you actually go about doing a lookback exercise because one of the problems for an infection control doctor in the previous guidance was TVC greater than 100 infection control team to assess the risk. Now the only way to assess the risk is to go through every set of case notes, find out what the patient's white cell count is, is this patient at risk, and it's potentially a huge problem. So it's difficult technically to do. There's also risks in terms of now we've got kind of more advanced bowel screening programmes, lung cancer screening programmes that taking endoscope washer-disinfectors out of use is not neutral. So it's a balance between the risks to the patient and the benefits of the lookback. I always kind of scratch my head and imagine if I was on the phone to a patient and said, you've just had an endoscope with a machine that's got 100 organisms, we don't know what the organisms are, we think you might be at risk, so we thought we'd phone you up and tell you. They're going to say, well, what are you going to do next? Well, the answer is, well, we don't know what we're going to do next because you're not going to go back in and do another endoscopy to take a bronchial lavage If it's a respiratory sample, if it's a colonoscope, good luck finding a kind of organism on the patient in that. If you can't really identify at-risk patients, then the question is, what are you actually wanting to do with the lookback exercise? And I think

that's hinted at in the question, that we are making ourselves feel better by doing something rather than actually doing anything tangible. The corollary of that though, is, if you look at all the case reports, they are in organisms that are pretty easy to identify. So it's carbapenemase-resistant, and unusual strains of things. So it does suggest that, you know, when there is an organism that's there, then you, you can relate it back to endoscopy. So I would say there isn't really a role of lookbacks unless you've actually got an outbreak and you can actually trace the outbreak back to the endoscope. But that means that you're probably going to miss the first couple because you're going to wait a while until you find somebody coming in with, you know, repeated biliary sepsis. Things like ERCP, it's probably more straightforward. If you're monitoring your ERCP infection rates. But if you've got, for example, you know, high bronchi, you're going to find a lot of Pseudomonas in them anyway. So it really is, you know, difficult to decide exactly when. My, my rationale would be if you can gain something by doing a lookback exercise in terms of further prevention, or you're going to manage that patient differently, then I would; otherwise I would tend not to.

Surabhi Taori 37:05

Thank you, Craig. Anyone else? No, so in the interest of time, let's head on to the next question. Alcohol is sometimes used to rinse and dry endoscopes after the final water rinse. Is there any evidence behind this? Can I ask Wayne to address this, please?



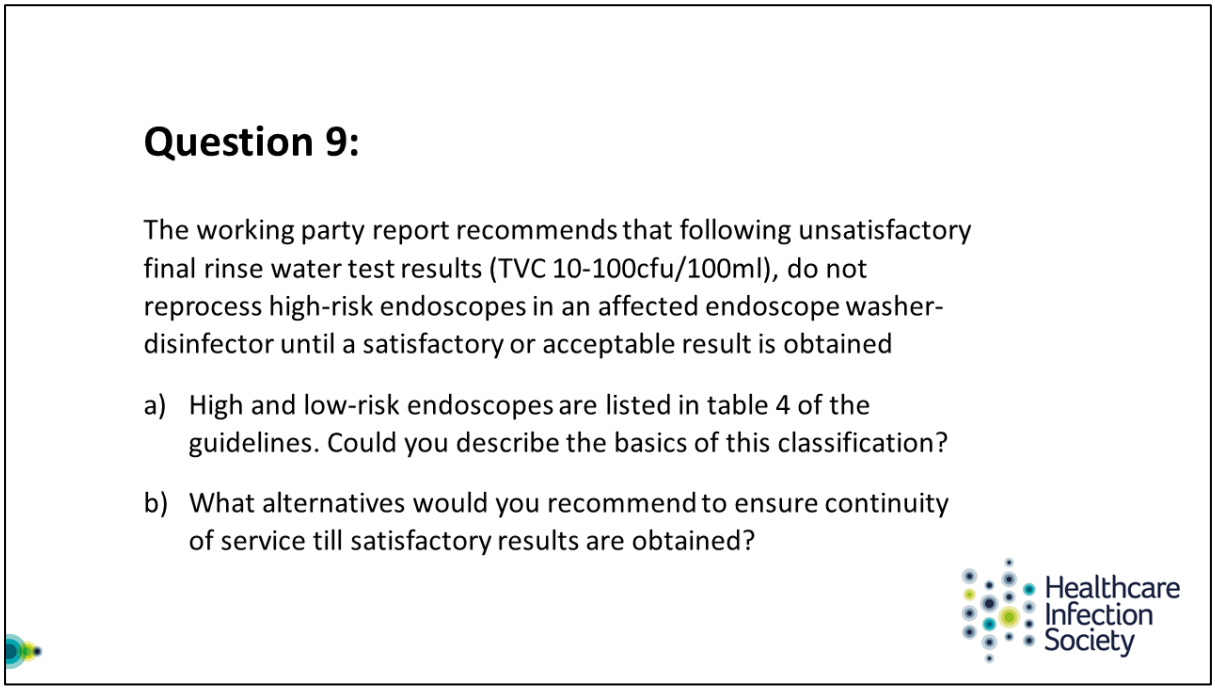
Wayne Spencer 37:40

Yes, you can. There may be evidence behind it. But I'm, I'm hopeful that nobody is actually still using it in the UK. And the reason for that is because alcohol is a fixative agent when it comes to proteins. We're spending a lot of time and effort in improving our processes and in protein testing, I think, without then complicating the issue by using a protein fixative in any of our processes. However, aware that in some countries, alcohol is extensively used at the end of the washer-disinfector cycle to assist with drying the endoscope. And, and the experience from those countries is it does have an

evaporative effect because they use the alcohol basically to drive the residual water out. Because alcohol in terms of its microbiological loading is a relatively safe liquid to put down the endoscope channels. That's what they do. However, it should not be used in the UK, and in fact the British Society of Gastroenterology in their decontamination guidance from 2017, which was updated in 2020, explicitly say that due to the fixative properties, the use of alcohol to assist in drying is not recommended. So it's actually out front and in there within the BSG guidance that you should not be using alcohol at the end of the washer-disinfector process to dry the endoscope. Besides which we now in the UK have some excellent drying and storage cabinets on the market, which allow us to dry an endoscope much more effectively.

Surabhi Taori 39:25

Thank you so much for answering that. Anybody else like to add on to their experience? No. So let's go on to the next question. Which may be the last pre-decided question. Oh, very long question. The Working Party report recommends that following unsatisfactory final rinse water test results (that is TVCs between 10 and 100 cfu per 100 ml) do not reprocess high-risk endoscopes in an affected endoscope washer-disinfector until a satisfactory or acceptable result is obtained. The two parts to this: high- and low-risk endoscopes are listed in table 4 of the guideline. Could you to describe the basics of this classification? Or basis of this classification? And the second part is what alternatives would you recommend to ensure continuity of service until satisfactory results are obtained? So I think for the first part, could Wayne and Jimmy give your views, please. Wayne maybe first and then Jimmy.



Wayne Spencer 40:39

Okay. We'll let the engineer go first and then the microbiologist can correct him when he's, when he's wrong. This was subject of a lot of debate, we had, I think, probably about 45 minutes at one of the meetings discussing this. And, and this table went in and out I think and we, at one point we

were we were discussing whether we'd actually issue any advice on what is high risk or not. And, and we sought sort of opinion from people, Helen Griffiths, for instance, who was on the party who's an endoscopist practitioner and, nurse, nurse endoscopist. And, and really, this is reflected, I think, what is custom and practice at most, certainly most NHS organisations up and down the country, in the UK, in particular, and that's based on what you would expect as the microbial loading in the place you're going to go with the endoscope in the first place plays a significant part in this. So the fact that you know, gastroscopes, and colonoscopes, scopes for the small intestine, and so on, are going into areas which already have a substantial microbial loading, and the fact that you're going to introduce 10 cfu per ml, you know, on, from an endoscope that probably hasn't even got one ml of water in there, there sort of has to be some sort of perspective put on it. And they thought that the risk was relatively low. But that in areas where perhaps cystoscopes and ureteroscopes are going, as you might want, not want to introduce any additional loading into those areas. And that in my simplified engineering form, is the way in which we came up with these, with these categories, basically. And I don't know if Jimmy, whether, add anything on that or not.

Jimmy Walker 42:30

I think you covered that very well, Wayne. As you say, you know, we let Helen lead on this and she came up with a good categorization there. In fact, Craig, did you want to add anything to that as well?

Craig Williams 42:41

No, I think Wayne's spot on with that, it's you know, the amount of bugs that you're going into compared to the amount of bugs you're likely to be putting in.

Surabhi Taori 42:54

Okay, so it seems a bit of pragmatism is, is part of the guidelines. And the second part of the question, could I ask Wayne to come in?

Wayne Spencer 43:05

Yeah, yeah. I guess there's no coincidence that since we've been doing increased rinse water testing that we've seen increased centralization of endoscope reprocessing. And the reason why I say it's, this is not by chance, is that obviously the easiest way to overcome problems with rinse water testing is to have a choice of machines. If you've got one machine in a very small department, and you get, you know, a count that's very, very high, then it doesn't leave you with a lot of options. You know, we've talked about risk assessment, and the document talks about risk assessing, and we've talked about categorization of these high risk and low risk. But if you've got, you know, too numerous to count, or you've got, you know, 105, or whatever, if you've only got one machine, you've got, you've got very little option. So I think one of the reasons why we've ended up now with bigger departments is because you've got a lot more flexibility. If you've got four machines, five machines, and you've got, you know, one machine with a very high count, then you can very often limit the use of that machine based on your risk assessment to perhaps only upper or lower GI

procedures. And then, you know, you've done your risk assessment on that machine and your others are okay. I think, and I think I said this when we discussed this offline, was that, I think in my experience of 20 years of doing this, I've only ever had one instance where in a department with three or four or five machines, where all the machines have come back with a very high rinse water result. And when we actually looked at that, the overriding factor in that was that the person as Jimmy had alluded to, at the very start of this seminar, the person who had taken the samples was a different person. And when the samples came back, they were all relatively slow-growing environmentals. So the two-day result was pretty good. But by the time we got to the five-day result, we were talking about taking all the machines out of service. And when we looked at it, they were all environmental, they were all Gram positive, they were all of a sort that was slow growing, and we thought, we took the opinion that obviously the person we'd asked to do the testing that week, we probably had not trained them properly. And in the way in which we presumed somebody else could take over the rinse water testing. So I think, when you combine the fact you've got probably multiple machines now in most departments, so I don't have of the 20-odd hospitals that I work with, I don't think I have one site now that only has one machine. Or I have one, sorry, I have one. And that's, that's four miles up the road from an acute, another acute site, which has a lot of machines, you know. So it's so rare now to have small numbers of machines. And I think that by not having that single machine issue that allows you to overcome a lot of the problems by doing routine water sampling and getting a lot of TVC results. But I think trending is vitally important. You feel a lot more comfortable using a machine with a high count, when you know it's a one off, than if you've looked at your results, and they've built up every week, you know, they've gone from two to eight to 10 to 15. And then that week, then the next week, they're 40 and the week after they're 60. You know, you know you've got an endemic problem then. But when you've had two, three for the last 12 weeks, and then you get 100, you know, chances are something's changed that you've done. And in terms of the water sample. So I think having that trending is also important and helps you get around that.

Surabhi Taori 46:44

Risk assessment is a fine art, isn't it? And very much applicable in this scenario. Anybody else, would you like to add? No. So we have around 12, 13 minutes left. Are there any live questions? Very interesting. How can you standardize PCR testing for environmental mycobacteria and Legionella? Does anyone in particular want to answer this question. Or give a go?

Jimmy Walker 47:33

Yeah, I mean, this is something which many people have been working on for many years, for example, Sam Collins at PHE undertook some terrific work looking at standardization of PCR specifically for Legionella for environmental waters. And it's enabled us to advance what, what we're doing today in terms of identifying outbreaks and identifying the sources. Because particularly with Legionella, it's very difficult to identify the sources so we can't come up with standard methods and eventually companies will start also which they're already doing, commercially selling standardized tests. So I don't think it's that difficult. Craig, do you have a view on that?

Craig Williams 48:17

I mean, I would kind of make probably a difference between the organisms that you're looking for like Legionella and mycobacteria, which are relatively, you know, have defined targets and the TVC. And I would also kind of echo Leila's point from earlier on about the difference between room-temperature bugs, 37-degree bugs, then live bugs and that kind of stuff. If you ever want to seriously scare yourself to death, take a bit of water from a tap and culture it at room temperature for fungus, you'll be amazed what you find in there. So there's a whole pile of DNA around the place that we just need to be careful about amplifying. But I think, as Wayne said earlier, it's the long term that, the tests are taking two to three weeks to turn around that we probably need to target first, and then maybe look at the trickier TVC stuff.

Jimmy Walker 49:02

And if people are hesitant about moving right to PCR, there are other tests available for Legionella, for example, a seven-day test for Legiolert. So there are companies out there selling kit, if people are uncomfortable or unsatisfactory with moving to PCR at the moment.

Surabhi Taori 49:24

Thank you both. Are there any more live questions? Could I ask the panel what their experience or view is regarding transportation of samples for TVC, issues with collection times, collection times/couriers and the impact of this on the subsequent results? Who would like to take this?

Wayne Spencer 49:58

I'm happy to have a first punt at this as it's a, it's a common thing. Yeah, it's, I think, first of all, people need to do a lot to control the process. I think, process control is key with this. The lab needs to have, most of the labs have an understanding of the impact, you know, when they don't treat the sample right. But very often it goes wrong in the first couple of hours or the first point at where they leave it before it's picked up. So the first thing I always do is I always try and do an analysis of the chain, if you like, of where that sample goes from the minute it comes out of the machine, to the time it arrives at the lab. And, and I have, and it's not only rinse water this applies to, I mean it happens with the whole remit of micro tests that we do on washer-disinfectors and storage cabinets. I had a whole set of storage cabinet plate tests fail because, and surrogates fail, because they were left an extra four hours on a windowsill in a department before they then went to the lab for analysis. And I think it's about understanding that journey that the sample goes on within your own organization even before the courier picks it up. Does your lab have good storage boxes to provide you with, that are thermally insulated, that can keep your sample in the condition it needs to be kept in? Ask your lab to report on the arrival temperatures of your samples, so you know, if they are arriving out of spec, then how far out of spec are they? What are the temperatures that these samples are arriving at when they get to the lab? And the lab should be able to give you those figures if you ask for them. I think, look at whether the contractor is reliable or not. I have terrible problems with DHL where I live, I would never in a million years ask DHL to do a water sample from my house because I know they just can't find it. So think about who you're using, do they have local familiarity with the hospital? Do they do other deliveries at the hospital and so on. And I think,

importantly, there are things you can do when it gets a real problem. I've got one trust now that what they've actually done is they've split their days for sampling. So they do three of their machines on a Monday. And they do another three machines on a Tuesday. So that if they then get a water failure that's due from a logistics issue, the chance of all their machines being out of action because of that is far less because that logistics only affects half the machine. And that way then that if you like they're going to get a problem, they're going to halve that problem because the others, they've got a fresh chance with the other batch of samples the next day. So they sample one set of machines on a Monday, the next on a Tuesday or a Wednesday. And then think about the days you sample on. You know, are you sampling on a Friday and is the lab closed on a Saturday and a Sunday, and not going to receive the water results until a Monday? You know, so you need to think about what days you sample on and where that sample journey is going to be.

Surabhi Taori 53:11

Thank you, Wayne, that was very useful. Anyone else has experience on this? No, then let's head on to the next question. Other than Pseudomonas, does the makeup of species behind the TVC influence urgency or significance of positive results? Any volunteers for this one? Jimmy, would you like to take a go on this?

Jimmy Walker 53:48

Yep. Thank you, Surabhi. Thank you very much. And other than Pseudomonas, does, what can we say about that? So does it, does it make a difference what's there? What I guess we're concentrating on is the total number of species there. And we're highlighting the Pseudomonas because that's what's going to cause the infections, and then we're going to be looking at, and also, we haven't specified, but we've suggested Legionella. And then your other quarter would be the mycobacteria. So there are, there are situations where there'll be microorganisms that could cause concern if they were to then contaminate the endoscope and end up in the patient, but we can't go, we've only got a limited amount of resources to be able to investigate these issues. And you can spend an awful lot of time trying to break down what species are present on the plate of all the different colonies that were there. And we just, we just can't do that. That's just not feasible. So yes, the set of species matter. But let's concentrate and use our resources to prioritize for what we can say for patient safety.

Surabhi Taori 54:54

Is there any evidence from studies or previous work that Pseudomonas tends to be more predominant in actual clinical infections?

Jimmy Walker 55:05

Craig?

Craig Williams 55:07

The Pseudomonas is kind of it's represented earlier on, along with a whole kind of zoo of things, but since people got better at reprocessing endoscopes, it tends to have been kind of carbapenemase-producing organisms and some Pseudomonas now again. Whether that reflects the interest in these organisms, rather than real prevalence, I don't know. This is, this is where we kind of get slightly circular because in the olden days when NHS labs used to do the water testing you could walk into the water lab, go I've got a bit of a problem in machine three, what's on the plate, you could have a look at it and go, ah, yeah, yeah, yeah. Now the stuff goes off site to a UKAS-accredited lab, if you phoned them up and said could you speciate the organisms for us, they'll probably say, well, firstly, we can't. Secondly, we're not UKAS accredited to do it. And the problem is, you're only going to get what you ask for, and we're asking for TVC, Pseudomonas and atypicals. So the problem then becomes kind of investigating a more complex outbreak. If you've got, for example, you know, you've got, for example, a Klebsiella that's resistant to an organism, you're going to have to take a ERCP test sample, probably doing them in your clinical lab. But as Jimmy says, you know, we're talking about what four or five case reports over the last five, six years now, so does that justify actually doing all the work on every single plate from every single endoscope washer-disinfector? I think the answer is no. What you need to do is, you need to recognize an outbreak clinically, recognize the organism clinically, because that's the way it's going to come, and then search for that organism in the endoscope machine when you know what you're looking for, rather than getting a huge, big list of potential organisms from every endoscope washer-disinfector, then trying to match it back. So it's, again, you know, in a, in an absolutely 100%, do-everything world, you'd get the list of organisms back, I'm not sure what you'd do with them when you got them back. But if you've got a problem, then I think you do need to extend the testing and look specifically for the organism that you're concerned of in the outbreak. I'm not sure whether Wayne know more than I do. But I'm not sure whether most of the water testing labs will be, would be set up to identify that. So you're probably actually talking about the water then coming back, either bugs coming back from the lab, or the water itself being sampled in the clinical lab. But that then causes problems because we've lost all our filtration kit, you know, we can't concentrate it, things like that. So that for me is a slight gap in how the whole thing works. How do you actually identify a complex single-organism outbreak using the method that we've covered?

Wayne Spencer 57:34

Yeah, no, I agree, you won't get anything from the labs. Very often you contact the lab afterwards and they say they've thrown the sample away. So even if they could test it, they haven't got the sample anymore. So and then if you take another sample, you probably find you get a very different result, you know, so it's almost impossible to do. I have some labs that by default will do oxidase positive or negative, but that, that's about as far as it goes, you know. Or they might tell you, Gram negative or Gram positive, which is very often helpful. But that's as far as it, you know, it's Pseudomonas. Have you got a Gram positive or a Gram negative, and that's about as far as you'll go with most of the commercial labs.

Jimmy Walker 58:14

Yeah, just to come back in there, I think it's also we've got with a MALDI-TOF is a terrific technology, but it's only as good as the database of organisms that are in it. And it's not unusual to get results

back from MALDI-TOF, it’s not specific enough, and you don't get any appropriate identification from it, so it doesn't give you any benefit.

Surabhi Taori 58:38

Thank you everybody, that was really useful for me and I'm sure for the audience. And we have about a minute to go. And I would like to thank everyone especially our panellists for making time and talking to us and also to the audience for, for logging in and making this engaging. And just to add a little bit more, certificates of attendance will be sent out after the event, and the recording and transcript will be available after the event as well. And just a reminder, past webinars are also available on the HIS website. So once again, thank you so much, and thank you to the HIS staff which you cannot see, Helen and Bee, thanks so much for making this run so seamlessly. Have a good evening.

Jimmy Walker 59:30

Thank you. Thank you, everybody, and thank you to all the panel members for helping to write the document which is absolutely fantastic. Thank you.