SCOTTISH HOSPITALS INQUIRY

Hearings Commencing
19 August 2024

Day 26
Tuesday, 01 October 2024

CONTENTS

THE CHAIR: Good morning, Mr Mackintosh.

MR MACKINTOSH: Today's witness is Dr Teresa Inkster and also tomorrow as well.

THE CHAIR: Thank you. Good morning, Dr Inkster.

THE WITNESS: Good morning.

Now, as you understand, you're going to be asked questions by Mr Mackintosh, who's sitting opposite you, but first I understand you're prepared to affirm.

THE WITNESS: Yes.

THE CHAIR: Sitting where you are, could I ask you to repeat these words after me?

Dr Teresa Inkster

Affirmed

THE CHAIR: Thank you, Dr Inkster. Now, you're scheduled for all of today and tomorrow. We sit between 10 and 1 in the morning, yes, between 10 and 1 in the morning, but we usually take a break at about half past 11 for coffee. However, should you wish to take a break at any other time, please feel free just to give me an indication and we'll simply take a break.

I'm very conscious of this because I'm rather hard of hearing: perhaps if you could, in answering questions, speak maybe just a little louder than you would in conversation. You've got the microphones there, which should assist, but maybe just a little louder/maybe a little slower than you would in a normal conversation.

THE WITNESS: Okay.

THE CHAIR: I would certainly value that, and we've got to bear in mind that everyone in the room has to hear. Now, Mr Mackintosh.

Questioned by Mr Mackintosh

MR MACKINTOSH: Thank you, my Lord. Can I start with taking your full name?

A Teresa Jane Inkster.

Q And what's your current occupation?

A I'm currently a consultant microbiologist and Infection Control doctor with ARHAI Scotland.

Q And that's part of NSS Scotland?

A Yes.

Q Did you produce a 390 page statement for the Inquiry?

A I did.

Q Are you willing to adopt it as the statement, or are there any small changes you want to make?

A I have two small changes, if it's okay.

Q Now, could you do it by the

paragraph references?

A By para. So, the first one is paragraph 146.

Q So, what we'll do for the assistance of the core participants present in the room is put page 55 on the screen if we could. So, what's the change at paragraph 146 that you need to make?

A So, the first line, “pre-2015” should just read “2015”.

Q Thank you, and what's the other changes you want to make?

A The other one is paragraph 884.

Q So, that is on page 280, if we could put that on the screen, please, and what change do you want to make to this paragraph?

A The date should be, "On 16 August..."

Q Thank you. Are there any other changes you need to make?

A No.

Q No, can we take that off the screen? Would you-- are you willing to adopt your statement as part of your evidence today and tomorrow?

A Yes, I am.

Q Now, clearly you've produced a very long statement with lots of information in it, and I'm not proposing to simply walk through it. What I want to do is pick up issues over the next two days, and perhaps for your assistance and those of the-- my colleagues present, is to-- I'm planning to do this in chronological order or something close to it and, in essence, what I plan to do, with a bit of luck, is to deal with the events up until the autumn of 2018 today, and deal with events after then tomorrow, but clearly we will take the time we need to take.

What is your current-- You’ve explain your current role already. Now, at the very beginning of your statement – I won't take you to it – you explain that when you became a consultant microbiologist in 2009, you sought out a role that involved Infection Prevention and Control, and the implication being that some microbiologists don't do that. We've heard evidence that in NHS Greater Glasgow, some microbiologists had some sessions as ICDs. How should the microbiologist who's not got sessions of ICDs raise Infection Control issues they come across in their practice as a microbiologist?

A So, there are various ways that they might do that. So, for example, in our department in the Queen Elizabeth, we would have a morning handover meeting. So, these other microbiologists are providing the on-call cover overnight, so they are covering Infection Control. So, they would hand over any relevant

issues to the team that morning, which would include the Infection Control doctor for the----

Q So, if something arose overnight or over a weekend, that's the handover there?

A Yes. That would be the handover.

Q What if it arose out of-- they've been asked to analyse a sample from a patient, they fed back the results to the clinicians, but they have an Infection Control concern at that point? How should they take that forward?

A So, normally they would communicate that with the Infection Control team, and by that, that might mean myself as the lead ICD or the sector ICD, but they would generally copy in the Infection Control nurses. Depending on the severity of the situation, they might also at that point copy in the Infection Control manager and the associate nurse director for Infection Control, so there would be what we would call a mailing list for each site, and everyone would be familiar of who to contact, depending on which hospital that they were working in.

Q Are there any circumstances when a microbiologist who's not got Infection Control sessions would do more than simply email it in to the Infection Control team?

A I suppose it depends on the gravity of the situation, and outbreaks and incidents can happen at any time, and they're very unpredictable. So, you could be faced with a situation over a weekend that requires escalation at that point in time, which might require more extensive emailing, including senior management or sometimes the creation of a document that we call an SBAR, a Situation Background Assessment, and Recommendation document. So, it would depend on the severity of the situation.

Q There seem to be lots of different sorts of SBARs that we've come across in this Inquiry, and you describe one of them which is created by a microbiologist. Are SBARs created by other doctors in this field as well, and other members of staff?

A I'm not really sure outwith Microbiology and Infection Control. When I started, I was informed that that was the way that the medical director liked to receive information. It's quite a clear and concise document. The way that it's laid out, it's quite brief, so I would imagine that other doctors may, in fact, have used that same form of communication to senior management, but I can't be absolutely sure of that.

Q Well, we'll probably come across these issues as we go along. What I'd like to do, however, is to take

you to page 13 of your statement, paragraph 13, where you just discuss your own role as a consultant microbiologist in the Glasgow Royal Infirmary. Sorry, paragraph 13, so it would be page 15. At the bottom of the page, you discuss your own role, in the middle of the page, at Glasgow Royal Infirmary. See paragraph 12?

A Yes.

Q Now, what I wanted to ask you is what connection you had before the early months of 2015 with the Southern General Hospital?

A So, I wasn't based there. I was based in the North, but I quite early on raised concerns about isolation rooms, which are known as the PPVL rooms. I----

Q Did they have some in the Southern General?

A Not at that time, but I was working in the North closely with Dr John Hood, who was the expert in ventilation internally at the time, and I remember him showing me the plans for the Southern General----

Q Well, no, it wasn't about the new-- We'll come to that. It wasn't about the plans for the new hospital. I wonder what connection you had with the old Southern General Hospital.

A Minimal. I went there as a trainee one day a week to just provide additional cover because they were short staffed. I think it was on a Monday. So, I would go there, I would be laboratory-based for that day, and I would do a ward round to the neurosurgical unit, which is the old Retained Estate, but that was my only input there up until I moved there.

Q We've got in the practice of asking anybody who has any connection the same question, which is: were you aware, even in that limited time you had connection with the Southern General, of any way that microbiologists or Infection Control teams in that hospital had any cause to consider any suspected link between infections in the Southern General and the Shieldhall waste treatment plant?

A No, I don't recall that being discussed.

Q Thank you. Now, if we think of the period prior to your appointment as a regional sector ICD – and I will deal with the period after that later – what was your perspective in broad terms of the institutional culture within the IPCT of NHS Greater Glasgow at that time?

A So initially, as I've detailed, I worked mainly at the Golden Jubilee Hospital, but I had one day a week where I covered the Western before I moved across the city to Glasgow Royal and I covered five sessions a week. At that time, I felt I had very good relationships

with the Infection Control nursing teams on both sites. I felt that NHS GGC Infection Control team at that time was very good at what we call mandatory reporting, mandatory surveillance, adhering to the National Manual, anything that had guidance around it. They were very good at workflow and presenting data, SPC charts.

Where I think they were perhaps-- I think they were unfamiliar how to approach new threats. So, something that was new and different and hadn't been described in guidance, I felt there was an approach where things might often be downplayed, that they might look for other reasons as to why these infections were happening, that they weren't particularly open to new knowledge at the time from, you know, the literature or discussions I'd had at meetings.

So I found-- and I've described a couple of incidents where I found it quite difficult to convince the SMT that there was a problem, and during a couple of those incidents, they withdrew support. So I was attending incident management teams with the local Infection Control nursing team who were very supportive, and I had support from the clinician and a Microbiology colleague of mine, a previous ICD, Professor John Coia, and we were sort of left to manage these incidents ourselves, and at one point I remember being asked to communicate to the medical director about one, which should be very unusual for me at my level, but it was like the rest of the team were taking a step back.

Q So, that's obviously not a period when we're looking at what happened, but what I want to-- what I will come back to at the end of your evidence is a series of questions about the consequences of what you've said in the whole evidence, and one of the questions I want to ask you then – so you might want to think about it – is the extent to which the culture that we will go on to discuss impacts on the questions that the Inquiry is focused on.

So, what I want to do is just focus about your experience and particular issue around new builds, ventilation, and water. Now, you've discussed your expertise in some detail in your statement in paragraphs 28 to 48 and 70 to 79. Now, I'm not going to take you to them because you've discussed it in some length, but I need to ask you a slightly invidious question about the time prior to you becoming lead ICD and about who in the world of NHS GGC had a particular skill set. That might have included you, it might not, it might include other people, and I'm keen to work out who was available, as it were, to look at things.

So, among the clinicians and the Estates managers employed by the board in 2009 – and if you can't answer this question, do say so – who do you think had the expertise to advise the board on the specification of new water or ventilation systems for a hospital?

A I would say at that time the person would be Dr John Hood and also, to a certain extent, Dr Penelope Redding, but John Hood was recognised as the consultant with expertise in both. He was the go-to person even though he wasn't a designated Infection Control doctor.

Q If we then step forward to 2014, to the year before the hospital opens, who then would have been the clinicians and Estates managers in the hospital who had the expertise to give such advice?

A So again, Dr Hood, but I think by that time also myself and Dr Christine Peters, because although we were in different hospitals at the time, we had built up quite a lot of experience in built environment issues. My experience was mainly in refurbishments, which is not the same as a new build, but I had developed considerable expertise, particularly in relation to ventilation, because I covered a surgical hospital.

So, operating theatres, I became very familiar with those, but I also covered the Beatson, so I was familiar

with the neutropenic rooms, and also the Brownlee Centre, which had negative pressure rooms for infectious diseases. Christine Peters brought expertise from her time in Crosshouse, so I would say at that time there were three of us, I feel, available that could provide that expertise.

Q Is there any particular reason you haven't identified any Estates personnel who have expertise in this area?

A Mainly because I didn't really know them. I think the one person who did was Mr Powrie. I'd worked with him in Glasgow Royal, and I would say particularly in relation to water, but also to a degree in ventilation. So, I would say that he was someone that I was familiar with at the time.

Q Right. Looking at the procurement of the new hospital, from the point of view of-- from the period where they set the clinical output specifications – so that's before the tender is issued – up through to handover, what should have been the role of the Infection Prevention and Control team in that process of specifying and building the hospital from your point of view?

A They should have been involved from the very beginning, from the absolute beginning. The planning stages all the way through the design, the

installation, the commissioning, and then maintenance. That's what I would have expected to happen, because at the time, there was a chief executive letter. I think that was 2007. The role was very clear in that. There was the associated SHFN 30, the HAI-SCRIBE document, and the process that was in place in North Glasgow, where I was working, was indeed that for refurbs.

I was involved all the way through the process, I would sign the plans, I would meet with architects, the clinical teams, very involved, do walk rounds of the area. So, it was a surprise to me to find the issues in the Queen Elizabeth, because it seemed to me that that culture, if you like, around new builds was embedded within GGC at the time. There was good practice.

Q There's been two alternative perspectives offered on this, one of which could probably summarised that the sufficient involvement was provided by the secondment of an Infection Control nurse, initially in the form of Annette Rankin and then Jackie Stewart. The second perspective that seems to come across is that there is something within some parts of HAI-SCRIBE documentation, SHFN 30, that implies that the primary focus of the role of ensuring compliance is for the project team. Now, how would you react to

probably those two together? Because they seem to be, in essence, the response to what you've just said.

A Well, I think Infection Control is all about team working, and the Infection Control nurses have a certain skill set, but as do the Infection Control doctors. We've heard from many witnesses – and I've heard this myself in GGC – that nurses did not do ventilation and water. So, that's obviously a big concern when you have a new build project. The impression that I was given is that their role was more about fixtures and fittings and general layouts, that sort of advice.

So, there seemed to be a big gap with very important things, in that there wasn't any medical leadership there, because at that time, Dr Hood was the go-to person, and he was dealing with all the water and ventilation issues across the city. So, why not have someone involved? I feel that an Infection Control doctor – at least one, possibly even more – should have been seconded. So, complete removal from their day job, and just given that as a task.

It's such a complex building with some very complex units that I think having expert opinion as well as just an Infection Control doctor involved in that. So, as we've done in the past, consult with Peter Hoffman. Dr Andrew Streifel in the States was responsible for, you know,

supporting John Hood with the Beatson. So, that's the sort of model I would have expected. So, leadership from nurses, leadership from doctors, but also consultation with external experts.

Q Thank you. I want to move on to your role at handover and the sense of what you discovered in 2015. I wonder if we can go to page 34 of the statement bundle, paragraphs 84 and 85. Now, you're discussing here that you didn't attend-- or non-attendance at AICCs, then the fact that you attended and you were told to attend but not to speak, and then you discuss the SMT meetings.

Now, this may be my fault, but my impression gained from looking at the minutes of the AICC and the IPCC and the management team is they don't seem to contain a lot of content about the various instances this Inquiry is investigating. They do seem to contain a lot of generalised, standardised reporting and systems. To what extent do you think the AICC – and I suppose also the BICC and the whole system – was effective in supervising the risk from unusual organisms that may have arisen from the water ventilation system in the new hospital?

A I don't think it was particularly effective. It felt to me that AICC was a tick box exercise. We had an agenda, there was a lot of reporting, but not

enough reporting about serious issues on the site or outbreaks. We were discouraged to speak up. When I first started, I was told that's how it was. You go there, you say very little, you leave it to the lead ICD to talk to things. It felt like a very controlled meeting, the AICC.

Q Thank you. I want you to take that off the screen. I want to now move on to the information you were given about the services that you were covering as regional ICD. Now, if I understand it correctly, that's primarily the adult bone marrow treatment service. Now, is that just 4B or does it extend to 4C as well?

A It was just 4B at the time. I think there was a bit of discussion as to whether I covered 4C, but it was 4B at the time.

Q Well, I'd like to look at a bundle document, which is bundle 14, volume 1, page 170. Now, this appears to be a discussion in August '14, and if we go back to the beginning of it, because I think it'll make more sense, at the start of-- on page 193. We appear to have an email from Mr Powrie, and then if we go to the next page 192, it's forwarded on to the SMT. If we go to page 191, this is-- Sorry, we have a link about CDC guidance here from you. Now, what I wondered is, why are you sending details the CDC guidance to David Loudon and Peter Moir, popping in the ICM manager

and the lead ICD, in February 2015?

A So I was asked to attend this meeting. I had been raising concerns about the isolation rooms, the PPVL rooms, with Peter Hoffman. They were a design that I was unfamiliar with. So I'd forwarded that to Professor Williams. So, I was involved with the isolation rooms, but also, at the time, I was covering the Bone Marrow Transplant Unit on the Gartnavel site in the Beatson, and it was explained to me that they were creating two rooms for bone marrow transplant patients within the renal ward in the hospital.

Q In the hospital?

A Yes, and the reason for that was that the Western Infirmary was closing. So, normally patients from the Beatson would go across to the Western Infirmary for dialysis because some patients with haematological disorders do require dialysis. So, the Beatson-- I mean, the Western was being closed down, so they would have to go to the South for dialysis.

Q That's where the Western's renal service was going to?

A Yes. So, there were two rooms for bone marrow transplant patients designated in-- I'm sorry, I think it's either 4A or 4D, but they weren't the same rooms that we had at the Beatson. They were lobbied rooms. So, that was why I was involved. That's----

Q So, can you explain for the benefit of us, what's the difference between the rooms in the Beatson and the rooms that are being talked about in this context in February 2015?

A So, the rooms in the Beatson were sort of traditional positive pressure rooms, so it was just a room at positive pressure, usually----

Q That means the air is at a higher pressure in the room. So it's effectively pushing outwards?

A Yes, the air is coming out the way. They were HEPA filtered. They had a high air change rate. These were a different style of room. These were the PPVL rooms, so the room itself is at a neutral pressure and it's the lobby that's at the positive pressure, and I was conscious that Peter Hoffman had concerns about the neutral pressure of the room. His view was that it's never really neutral; it's either positive or negative. So either way you will get leakage in one direction or the other, and that could potentially put immunosuppressed patients at risk----

Q So, the concern would be that if you had a PPVL room where the room itself wasn't properly sealed, then air could get into the room even though the lobby is preventing the door from providing the air?

A Yes. So that was his concern. So, part of the reason-- Well, there were a few reasons for sending CDC guidance. CDC guidance is much more descriptive than the SHTM.

THE CHAIR: Now, when you say CDC, that's the United States Center for Disease Control?

A Yes. They had an environmental guidance document at the, quite comprehensive and a lot of detail on what they call protective environment rooms for immunosuppressed patients, and it went beyond just the basic specification. It also gives you different schematics as to how you can utilise a lobby. So, there are two things you can do with the lobby: you can have it at a positive pressure and the room at a positive pressure, and that's what we would call a positive pressure cascade, which means the lobby is at 10 pascals and the room is at 20 pascals, and that's giving the patient an extra layer of protection.

MR MACKINTOSH: So the air is effectively moving from the patient's room out through the lobby to the corridor?

A Yes. The other thing that you can do with a lobbied room is that you can have the patient room at a positive pressure and the lobby at a negative pressure and the benefit of that is that you can have an immunosuppressed

individual protected in the room, but if they have an airborne infection, for example, chickenpox or tuberculosis, you're protecting other patients. So, that CDC guidance was much more descriptive as how you could utilise a lobby in a different way than the PPVL concept.

Q So, at this point, this is February 15th, so this is after the hospital has been handed over to the Health Board. Were you aware of that at the time?

A No.

Q What would have had to happen to change these rooms that were being talked about in this conversation, these two rooms in 4C, 4A, 4D, all the rooms in 4B to the CDC specifications? What would have had to take place in order to do that?

A Well, patients shouldn’t have been moved across for a start.

Q Shouldn't have been moved across?

A Shouldn't be moved across. So, there would have to be a delay in moving patients across, but this would be for both fairly significant refurbishment-- So it would require, you know, experts to come in and actually develop proposals as to what the ventilation spec is going to be and how they're now going to do that on a retrospective basis. So there's all

sort of implications possibly in terms of air handling units, duct work, degrees of HEPA filtration. So I think what I'm saying is it would not be straightforward; it would cause significant delay.

Q How was your provision of this guidance note received?

A I didn't get a response, which is why I had to send it again. I think I sent it twice. Maybe it was before the February meeting, but I recall having to send it twice because I didn't feel that people were listening to me at the time.

Q Now, if we can turn now to the topic of the Horne Optitherm taps and your awareness of those. You cover them in page 43 of your statement, page 112. Now, what I want to do is just to put something to you because you're discussing the need to remove flow straighteners. In essence, that's the point you're making. Now, if you nod, the poor person to do the transcript doesn't get very far.

A Yes.

Q So, yes. Were you aware at this point, i.e. early in 2015, of the 7 March 2014 meeting-- sorry, start that again, the 5 June 2014 meeting between NSS and GGC people and indeed the Horne company and external experts about these taps?

A So, I knew a meeting was to take place because I was working in HPS at the time and there was difficulty with availability, and by the time the meeting took place, I had left the role. So I knew a meeting was scheduled. I did not see minutes of the meeting until actually I think it was the 2018 incident when Sandra Devine forwarded them to me. I was aware from water technical groups that there had been a decision that the taps would remain and that there was to be a risk assessment around those taps, and options at that time were to attempt to remove some of the flow straighteners in high-risk units or consideration be given to water testing, but there was an agreement, I think, at that point that the taps would remain throughout.

Q Well, if we look at the minute, which is at bundle 15 at page 692, and if we go-- we look first at the people present, Mr Gallagher and Mr Powrie and Mr McFadden from the Health Board. If we go on to the next page, at page after we get to the end of the minute – there we are – we have an action point at 5.3. So, given that what the conclusion of this minute is that they're-- the flow straighteners-- the taps are to remain, and there's no need to remove flow straighteners, but that any residual perceived or potential risk would form part of routine management processes, should you have actually received this at the time you were appointed lead ICD, if

not earlier, or have you been told what was to happen?

A I should have been told what was to happen. I did attend board water safety groups where it was discussed and there was a risk assessment put in place. There was discussion about whether we could remove the flow straighteners, but I recall Ian Powrie saying that wasn't possible, so it was considered at some point. I remember raising concerns about it because I'd been involved with the SBAR and HPS, and I asked that we start testing the water.

Q So, when's this?

A Oh, this would have been towards the end of 2015 into 2016. I recall meeting with Mr Powrie to discuss and it. It will be in the board water safety group minutes, because my concern was that the flow straighteners were still there, and if we couldn't remove them, then we would need to embark on regular water testing. I faced resistance initially with that because at the time Health Protection Scotland had released the national Pseudomonas guidance and it did not recommend water testing. It was different from the guidance in NHS England and Wales at the time. We did advocate for testing.

Q So, this is just-- If we can catch in there before we go too far. There was the instance in Northern

Ireland----

A Yes.

Q And Western Australia which prompted a letter, widely circulated in Scotland. There's the meeting in June ‘14.

A Yes.

Q There's the SBAR from HPS, which you were involved in, and would it be fair to say that at the end of that process there is a decision or a conclusion out of this meeting that the taps don't need to be removed?

A Yes.

Q Yes. There's also inclusion that the flow straighteners don't need to be removed. What do you now understand to have been the thing that should have been done? If we don't remove the taps and don't remove the flow straighteners, what's effectively the decision in 2015 of what should be done?

A I mean, my preference would have been to remove the taps, but what should've been done?

Q No it wasn't about your opinion, it's what you think. What should have been done? What do you think the process----

A Water testing. Water testing should have been implemented.

Q What about cleaning or maintenance of the taps?

A Oh, yes, absolutely, but that

should be happening regardless . That's standard.

Q When, as far as you're aware, was there a program of regular maintenance to these taps designed to address this risk started?

A I think I recall maintenance being discussed at the board water safety group meeting, but just because something is discussed doesn't necessarily mean that it's happening.

Q But we've heard some evidence that cleaning these taps was quite a convoluted process, so I'm wondering when you would have noticed that happening actually in the wards of high risk patients.

A I never noticed it happening in the wards of high risk patients until 2018.

Q So, what were, as far as you understand, the routine management processes that did take place in '15, '16, '17 about these taps?

A I don't know what that refers to. I would assume that that would mean water testing and, as you've said, maintenance of the taps.

Q But did that happen?

A In addition to that, there would be flushing-- would be really important as well and, you know, just ongoing identification of what we would call little used outlets process for that removal of dead legs, all that sort of thing.

Q So it's a combination of all four of those things?

A Combination of many things, not just tap maintenance and water testing.

Q Okay. We can go to back to your statement, please, to page 47, paragraph 122. So, you're discussing in this section observations about the function of the IMT, but it's the final sentence, and the context here is, I think, early in your appointment, "I have mentioned that there was no exceptional reporting process in place in the hospital where the ICDs would be routinely made aware of specification and specification results." Now, firstly, are you talking about before you became the ICD at this point?

A Yes.

Q Right. We've heard some evidence that there was a process where out of specification results was sent to the lead ICD. Are you able to comment on whether that was actually happening?

A That happened later because I had to initiate it.

Q So there's some suggestion that Professor Williams would have received out of specification results. Are you aware of that?

A I'm not aware of that because I recall emails between myself and, I think, Mr Powrie and other people about the

process around Legionella testing results, and it was clear to me that there was not the same process that we'd had in Glasgow Royal, which was this exception reporting, and I recall meeting with him to actually set that up, and I remember seeing gaps in that. In particular, the Paediatric Bone Marrow Transplant Unit was not included on the list for sampling. So, I recall all of that, so I'm not aware of the processes by which Professor Williams would have received the results, but by the time I came along as lead ICD, I had the same process in place that I'd had in Glasgow Royal Infirmary.

Q When did you create, with Mr Powrie, this process? What's the date of this review?

A I think that was around December, triggered by----

Q December which year?

A December-- Sorry, December 2015, triggered by the cancellation of a meeting. So myself and Dr Peters had been raising concerns about not having seen water results and there was no process, and we'd arranged a meeting to go through all these results and it was cancelled.

So we didn't see the results, but I followed it up with Mr Powrie and asked him if we could put this exception reporting process in place. I certainly met with him at the beginning of February

because details of that meeting are in the board water safety group from around that time, and I discussed aspects of that meeting at the Senior Management Team also I think in February 2016.

Q Now, would this be the document-- the sort of first version of the out of specification reporting list that appears in the water safety plan for the site now? Now, I was going to come to this later on in your evidence, but I might just pick it up now, but I'm just desperately looking for the reference. Do you remember-- Are you aware there's now a water safety plan for the whole site?

A Yes.

Q And have you seen that recently or before you left?

A I hadn't seen it before I left. I've seen it in the bundles.

Q All right. If you just give me a second, I'll find it. (After a pause) Well, we'll come back to that when I have it in my notes, because I think otherwise it'll slow us down. What I want to do now is move on to-- Well, firstly, at the time you became lead ICD, what confidence did you then have that you were receiving all out of specification results?

A I had much more confidence because we had the process in place and I was receiving them for Legionella. We had also started to roll out seudomonas

testing on a gradual basis, so I was starting to see results coming through for, for example, the Neonatal Unit as well for Pseudomonas. So, I was getting those results. At the time, that was the main focus of our testing was Legionella and pseudomonas and not much else. The only other time that we might get results was if there was an outbreak or an ICD had asked for testing to be undertaken in response to certain bacteria.

Q Now, what I want to do now is to look at the period after handover and your involvement with the Adult Bone Marrow Transplant Unit, and I'd like to take you to a meeting that you appear to hand with Miss-- Dr Peters and Mr Powrie on 25 June 2015, which appears to be summarised in a note which is bundle 14, volume 1, document 16, page 337. We see the top half is an email from Christine Peters, and the bottom half is another email from Christine Peters, but do you see how it says:

> "Thanks for your time today and for arranging the meeting today with David Hall and the rep from Brookfield (David?)."

A Yes.

Q So, what I want to ask is-- So, at this point, Professor Williams was away?

A Yes.

Q Right, and you've already explained your interest is in 4B, and so why are you interested in 4C at this meeting? "Why are you there?" is the essence of the question.

A So, Professor Williams had asked me to cover for him as lead ICD while he was away.

Q Right.

A But also, at that point, there was discussion about me just moving to the Queen Elizabeth site from Glasgow Royal Infirmary, so I think both myself and Christine felt it would be a good opportunity for me to become familiar with the broader site, because at the time Christine worked part-time and I would be covering her days off. So, I needed to have some knowledge of the hospital as a whole as well.

Q So, that's why the agenda, in a sense, covers Christine's territory?

A Yes.

Q Right, I understand. Now, if we look in the note, we see at bullet point eight a reference that I'm slightly thrown by, which I wonder whether it might be an error. Do you see it says, "Most of the rooms on 5B Haematology oncology"? Should that be 4B at that point?

A Yes, that's an error.

Q At this point in June 2015, why is there no mention in what----

THE CHAIR: Sorry, just so that I'm

following, that's-- point 8 should be----?

MR MACKINTOSH: 4B.

THE CHAIR: Yes, okay. Thank you.

MR MACKINTOSH: Now, if you read through this list, we see discussion of mechanical ventilation, HEPA filtered, positive pressure lobby rooms, where the extracts are, the presence-- the absence of testing, pressure gauges, alarm systems, and pressure-- item 9, pressure differentials. Now, that's not all of the items, but those are the topics that get picked up across this list, and if we just go onto the next page, we have an air change rate at 10 discussed in the context of the 5B-- I think that means 4B rooms. So, if we go to the previous page, it goes 9:

> "The [4B] rooms [I'm assuming that is] are not designed to be positive pressure rooms to 10 kilopascals differential to corridor, [and over the page] the air change rate we think is 10 per hour."

It wasn't 10 per hour, was it?

A No.

Q No. What do you think it was actually at that point?

A Around 6.

Q Right. Then, we have commission of validation data, and effectively much discussion of all the traditional elements of ventilation in a hospital room that you find listed in SHTM 03-01. The one that's missing is discussion of air change rates outside the isolation rooms. Why is that not in that meeting? Why are you not discussing air change rates outside isolation rooms at that point?

A I think this is a problem with interpretation of guidance in the SHTM 03-01 and the reference to Neutropenic Ward. I think most people at the time were taking that to mean Neutropenic Rooms.

Q Well, what we'll do is-- I'm going to ask you a second question, and then actually we'll jump ahead, and we'll look at that document. There's also not mentioned in here, in the context of 4B or 2A, of the double doors that many witnesses, including those not experienced ventilation, describe of being present at their predecessor units elsewhere. Again, why do you think that's not in this list?

A I think that's not there because the SHTM 03-01 is not descriptive enough.

Q Right. Well, let's go and look at SHTM 03-01. So, we're going to find that in bundle 16, document 5, page 342. Now, I'd like to go to page 483, which I think might be the table, which is probably the place where we're going to

find the information. Now, this is-- You're familiar with this document? I want to just check.

A Yes.

Q Right. Now, the Inquiry has heard considerable evidence in the Edinburgh Sessions about the entries in the 2014 version, but this is the 2009 version. I'd like to start, as it were, by trying to understand what's going on in this table. So, if we use, shall we say, a relatively uncontroversial location such as operating theatre, which is two-thirds of the way down the left-hand side, this table is showing us-- What does the "S" in the first column mean?

A That's your supply.

Q So, that's telling you it should be mechanically ventilated?

A Well, it's the supply of clean air is what it means, yes.

Q Right. Then, what does the next column-- the 25, what does that mean?

A So, that is the air changes per hour.

Q And the next one?

A That is your pressure. In that case, that's a positive pressure.

Q So, that would mean that the air is going from the room outwards?

A Yes.

Q And then you have an F7 filter.

A Mm-hmm.

Q Now, is that what we've been talking about as a HEPA filter or is it just a more conventional filter?

A No, no, that's not the same specification of a HEPA filter. That is less efficient than a HEPA filter.

Q And then we have a temperature range of 18 to 25.

A Yeah.

Q Now, let's go and look at the Neutropenic Patient Ward entry, which is about nine rows down. If we ignore for a moment what Neutropenic Patient Ward means – we'll discuss what that means and what it might mean and what the uncertainty is in a moment – what's it telling us that this guidance is proposing for the ventilation for that space?

A So, it's telling us 10 air changes per hour, positive pressure of 10 Pascals, and HEPA filtration to 12.

Q Now, if you interpret that as a room, is it possible to build such a room without a lobby?

A Yes, but I would prefer to see a lobby there.

Q Why?

A Because if you're just focusing on the room and not the corridor, you can have ingress of contaminated air into the room, and your only protection is a door, one door, so if the door is left open for a period of time, the pressure will drop and you will get ingress of contaminated air.

So, if you're in a situation where you do not have a HEPA-filtered corridor, adding a lobby is going back to that positive pressure cascade that I described, provides that additional layer of protection from unfiltered corridor air.

Q Again, thinking only about a potential single room applying this standard, would this room have to have a sealed ceiling?

A Absolutely, mm-hmm.

Q And would it have to have a wall that extended to reach the ceiling?

A A what, sorry?

Q A wall that extend----

A Yes.

Q Now, was it in fact the case that some of the isolation rooms in the hospital didn't have these two features?

A Yes.

Q Right. The HEPA filters that are mentioned here, are these-- some----

THE CHAIR: Sorry. Sealed ceiling, yes. Wall extending to ceiling, yes. I think it was your question I didn't hear.

MR MACKINTOSH: Yes. Were there isolation rooms in the new hospital in 2015 which had been built with suspended ceilings and walls that didn't extend right to the hard ceiling?

A Yes.

Q Right.

THE CHAIR: Thank you.

MR MACKINTOSH: When you come to the filters, are we talking about portable filters or filters within the ventilation system?

A Within the ventilation system.

Q Okay, right. Let's again look at this-- If the definition – we'll come back to definition in a moment – is for the whole ward, how would you achieve these requirements for a whole ward? What would that physically involve?

A In terms of refurbishment, do you mean, or----?

Q Well, in terms of-- Would it have to have a lobby at the entrance to the ward? If you're going to achieve 10 air changes and 10 pascal positive pressure on a ward, would you have to have a lobby at the entrance to the ward?

A I'm not convinced a lobby would be essential if you were achieving HEPA filtration in a corridor and a positive pressure of 10 Pascals and air changes of 10. If it was to design a gold standard unit, I would put the lobby in place simply because it gives an extra layer of protection against outside corridor air as opposed to the corridor in the ward, so there's an extra degree of protection, but if you're in a situation where you have a corridor to the spec and then you have an anteroom that's a positive pressure and then you have the patient room at positive pressure, that's a fairly high degree of protection.

Q Right. Would you have to seal the whole ward from the rest of the hospital in order to achieve-- if it's the whole ward that's been done?

A Oh, absolutely. I mean, that would be a fairly major construction project requiring HAI-SCRIBE and various control measures for other groups in the vicinity, particularly the neighboring Haemato-oncology Ward, 4C, because those patients would be at risk.

Q Again, the filters would be in the ventilation system, not portable ones? Right. Anyway, let's go back to the reason we went here, because you touched on what you thought there's a lack of, I think, detail. What's the issues around these three words, Neutropenic Patient Ward, that you feel there's some interpretation or there's some history of interpretation here?

A Well, it doesn't discuss lobbies. They're not mentioned. It's not specific about double-door entry. It doesn't discuss all the other areas of the ward and how you might apply positive/negative pressure, HEPA filtration. Not all areas in a Neutropenic Patient ward can be positive pressure. There are what we would refer to as "dirty facilities," for example, domestic services room, dirty utility. So----

Q Because, if you go three rows up, you have a row for dirty utility.

A Mm-hmm.

Q That requires six air changes and more importantly a negative pressure.

A Yeah. So, essentially, when you're looking at this table-- and I think this is part of the challenge for Infection Control teams is you're having to bring together information from different sources and sometimes from different guidance documents. I should say that this has been recognised in-- ARHAI and NSS are now producing notes for wards on bone marrow transplant and haemato-oncology units to give Infection Control Teams in particular much more detail around what we mean by a Neutropenic Patient Ward and design of a Bone Marrow Transplant Unit.

Q Because I appreciate there's the issue within the ward about the features you just discussed, but there's also the question of, do you need to do it for the whole ward? Now, given at the time you had that meeting – we were looking at the minute – you were the ICD with responsibility for what is 4B, given the patient cohort in 4B, shouldn't this guidance suggest that the whole of 4B would have been treated HEPA-filtered, positive pressure, 10 air changes an hour?

A Yes.

Q Can you understand, from all

the meetings you've been in, why it wasn't?

A I believe that was a challenge of a retrofit in terms of what the air handling units could cope with, the ductwork, that sort of thing. This was not, you know, a brand new build at this stage----

Q Because the unit was added into the project in 2013 or thereabouts?

A Mm-hmm. So, it was originally meant for the patients next door, the General Haematology patients. So, you're working in the constraints of a refurbishment, which is much more difficult. You don't have a blank sheet of paper that you can deliver a spec in that situation, so compromises, I suppose, have to be made to that spec.

Q So, the idea that that ward then comprised individually protected-- and you disagree about the appropriate protection, but individually protected rooms is-- you see as the compromise as part of the process.

A Yeah. I would have preferred to have seen anterooms built into that unit, but we were-- because it's a refurbishment, we can't create anterooms because there simply isn't the space to do so, and you're faced, you know-- Many times as an Infection Control doctor during this process you're facing very difficult situations in terms of decision-

making and risk assessment. Do you continue to pursue for what you would have as a blank slate and you would design, and risking, you know, shutting down a service or people being at another hospital where there isn't an Intensive Care Unit? So, you're constantly having to balance the risk, but----

Q So, if we take 4B-- and I recognise I'm asking you to do hypothetical's here, but given that you've explained that you sort of understand that there's a compromise and you understand how the compromise came about, if it had been fully understood that this ward couldn't have 10 air changes an hour and couldn't all be HEPA-filtered, would the option of returning to the Beatson have existed-- staying at the Beatson and never coming back in 2013, have existed as far as you understand it?

THE CHAIR: Sorry, just so that I'm following. The question assumes that you can't have the air changes and----

MR MACKINTOSH: You can't have HEPA filters.

THE CHAIR: What did you say about HEPA filters?

MR MACKINTOSH: And you can't HEPA filter the whole ward.

THE CHAIR: Right. Thank you.

MR MACKINTOSH: If that's understood, if that was understood back

in 2013 before-- when decisions are being made, as far as you understand, did the option exist of staying at the Beatson permanently?

A I don't know back then if that was discussed. My understanding was----

Q No. I appreciate that's not the question. It's: do you think the option existed in the sense that could the Beatson have coped with the Adult Bone Marrow Transplant just staying there?

A The building itself, yes, it could have, but the facilities attached to it, no. So, there was no Critical Care and there had been an HDU, but I understand that the HDU beds were closing, but the actual building----

Q So, that's an example of this compromise?

A Yes.

Q Right. Now, if we go to the Paediatric BMT-- the ward that contains Paediatric BMT, 2A. Now, this is out of sequence. I was going to come to this later, but since we're looking at this table, to take things quickly – and we'll look at how you learnt this later – am I right in thinking that there comes a point when you realise that in Ward 2A there are isolation rooms, and you get to a discussion about whether they're the right type. That's right?

A Yes.

Q But the whole ward is not positive-pressured? You're nodding again.

A Yes, sorry.

Q The whole ward's not HEPA-filtered? Is that yes or no?

A That's correct.

Q Yeah, and the whole ward's not 10 air changes an hour?

A Correct.

Q Right. Now, going back to this definition of a Neutropenic Patient Ward, why should a reader not just look at that, those three words and think, well, the whole of Ward 2A is a Neutropenic Patient Ward, and what's wrong with that as a concept?

A So, Ward 2A was not a full Bone Marrow Transplant Unit. So, Ward 2A has essentially three different patient groups within it. So, it has bone marrow transplant patients, it has general haematology patients and it has oncology patients. So, there are three groups with slightly different requirements, so if we think about the adult setting, we have bone marrow transplant in 4B, we have a separate ward for haematology 4C and we have oncology at the Beatson, but in 2A they're all combined, and that's why, around that time, the design of the children's ward, the haemato-oncology ward, was on a proportion of bone marrow transplant rooms only rather than

a full neutropenic ward, because many of the patients are not in fact neutropenic. So, it was quite common at that time to have that sort of design.

Q What was the design of the old Yorkhill facility, the old Schiehallion?

A My understanding is it was very similar. I didn't see a specification but I did have a folder given to me by a colleague, Dr Balfour, that contained all the air sampling results and also some posters that had been presented at conferences that were describing an upgrade to create eight isolation rooms from six, and within that poster there is reference to not having any contingency in the ward. So, I'm making the assumption that it was not a fully neutropenic ward. I think it may have had a double-door entry.

Q There does seem to be evidence of that.

A And the proportion-- which latterly was eight in around, I think, 2013, '14, I think.

Q So, that's eight air changes an hour.

A No, no, sorry, eight isolation rooms designated for BMT, and I believe they were HEPA-filtered.

Q The isolation rooms?

A Yes.

Q What about the whole ward? Do you have any knowledge about that?

A I don't believe the whole ward was HEPA-filtered, but I can't absolutely confirm that.

THE CHAIR: Sorry, my fault entirely. We're now talking about the----

MR MACKINTOSH: Old Schiehallion, my Lord.

THE CHAIR: Yes, the old Schiehallion, yes.

MR MACKINTOSH: So, I think you're saying that the old Schiehallion had eight isolation rooms, were HEPA-filtered?

A Yes.

Q It probably had a lobby, but you don't know whether it was HEPA-filtered?

A No.

Q Do you know what its air change rate was for the rest of the ward?

A I don't.

Q No. Now, if you take a, sort of, purely legalistic approach to these things – and I suppose the people asking you questions are all lawyers – Neutropenic Patient Wards seems very simple. It's got neutropenic patients in it. They may not be all of them, but there's-- quite a lot of them are neutropenic at times. It varies. Therefore, the whole ward should be treated like this. Why is that wrong, or why is that not the right answer?

A I don't think it's wrong anymore with everything that we've learnt from the

RHC site. I think, through the process, what became evident to me is that on paper, eight Bone Marrow Transplant Units look fine, based on the numbers of----

Q So, what rooms rather----

A -- procedure, yes, rooms, based on the number transplant procedures, and there was clinical input into that, but what is not thought about is contingency. So, what happens when something goes wrong in that room? And that was often the case. There were issues, obviously, with the ceiling of the room. There's the need for annual verification reports. There's the need for maintenance of air handling units, and there's no contingency.

Q Because there's not a spare air handling unit.

A There's no-- yeah, and there's nowhere to put children safely. There's no other ward that could accommodate these patients. It's not unique to the RHC. It's happened elsewhere in Scotland, but it is something that needs to be, in my view, considered now when we're thinking about the design of these units. It's not as simple as just a proportion of rooms for a procedure. We need to have contingencies should something go wrong, so that changed my view, when----

Q And that contingency was making the whole ward meet the standard?

A Yes.

Q Now, if we go back to 2009-- So, obviously you weren't involved in 2009.

A No.

Q But given that you've just said what you've said, I'd like to understand what you think a, sort of, fair-minded approach to these things would have been back then. Where was the consensus back in 2009 about whether this table, which is the 2009 version, requires the whole ward to be 10-10 HEPA-filtered?

A I don't know why the decision was made. I believe it was based on the model at Yorkhill and the number of rooms they had for bone marrow transplant at Yorkhill. I think at the time, for such a complex unit-- and thinking about what Dr Hood did with the Beatson, I think there should have been more expert input. So, you know, GGC had designed the Beatson.

Q So, this is the predecessor of 4B.

A Yes.

Q Yes.

A But, you know, this is still a complex project, a children's Paediatric Bone Marrow Transplant Unit. I think perhaps if there had been more expert

input into it, then maybe these conversations would have happened.

Q You didn't really answer my question. If you're saying that now, knowing what we all know now, including this experience in this hospital, one would interpret a Neutropenic Patient Ward to include any new Ward 2A-type facility, that's now. Back then, effectively, what would have been the consensus about whether the new 2A was a Neutropenic Patient Ward? What would have been the view taken at the time?

A I think it would have been a ward of neutropenic rooms.

Q Right. Even though the guidance doesn't talk about a ward----

A Yes.

THE CHAIR: Sorry, just give me that again. Could you just repeat your last answer?

A To the question, yes?

MR MACKINTOSH: I said, even though the guidance doesn't include neutropenic patient rooms as a row and you said----

A Yes.

Q I think you said, yes. I think she agreed with me.

THE CHAIR: Sorry, it's entirely my fault. We're looking at the situation in 2009. The version 1 guidance is available, and Dr Inkster is being asked as to what would be the consensus as to

the interpretation of what was required by a Neutropenic Ward room. Have I got the question right?

MR MACKINTOSH: No. The question is, “What would the consensus have been of whether a Neutropenic Patient Ward applied to the-- to Ward 2A as it's being envisaged in 2009?” and I'm interpreting your answer, Dr Inkster, as it would have been interpreted as neutropenic patient isolation rooms within the ward.

A Yes.

Q But the rest of the room-- ward wouldn't have required to have been at this standard.

A Yes.

THE CHAIR: Thank you.

MR MACKINTOSH: And you've already explained – and I won't go over it again – why you think that the sort of literalist, legalist approach doesn't work because of the mixed patient cohort.

A Yes.

Q Right. I think what we'll do is we'll move on. We may come back to this. Can we take this off the screen, please? Now, if we go back to that meeting, we won't put it on the screen, remember the meeting on 25 June between you, Dr Peters and Mr Powrie? We have various emails, which I put in your document bundle, and I don't think I need to take them-- you to them,

potentially, which describe what you're raising with other people in the hospital about Ward 4B. Now, what I'd like to understand is what's the point you're trying to make in June/July 2015 about Ward 4B?

A Based on the information that we had to manage to glean, we felt that it wasn't safe for patients to be in the unit.

Q And ultimately was there a decision made that the patients would return to the Beatson?

A Yes.

Q Right. Now, am I right in thinking that your involvement as opposed to Dr Peters' involvement was, in a sense, because Professor Williams was away?

A Yes, that's correct.

Q Right, and he returns. Now, in early July, you resign your ICD sessions. I want to come back to that, but before I do that, I want to look at the paediatric ward. So, you explain in your statement at page 96, at paragraph 273, is that you received an email from Sandra Devine. If we can put that on the screen, that's Bundle 14, volume 1, page 263, and this is an email from Sandra Devine. She's asking you for information about Ward 2A, and this is presumably just before Professor Williams returns from the context.

A Yes.

Q Is this when you first realised that there were no HEPA filters in the isolation rooms in 2A?

A Yes.

Q Right. Now, we've had a big conversation already about the differences between 2A here and 2A in the old Yorkhill, but I'm assuming the old Yorkhill had HEPA filters in the rooms, the isolation rooms.

A Yes.

Q Right, yes. Now, the one thing we haven't talked about in the context of the old Schiehallion and the new Schiehallion is air change rates outside and inside the isolation rooms. So, I know you've explained that you didn't know what the air change rates were outside the isolation rooms in the old Yorkhill, and you're nodding at me.

A Yes.

Q At this point, when you get involved do you discover not only whether there are HEPA filters, but what the air change rates are in the isolation rooms in Ward 2A?

A No I didn't, no.

Q And did you discover what the air change rates were in the general part of 2A?

A No.

Q No, and we've discussed neutropenic already. Just to wrap up that topic on neutropenic, you're aware of the

Innovated Design Solutions report in 2018 for this ward?

A Yes.

Q The view is expressed by the author of that, Mr Lambert, that Neutropenic Patient Ward means what it says on the tin: if there are neutropenic patients it in, you do the whole ward.

A Yes.

Q In 2018, was that a part of the consensus, or was that an unusual position to take?

A I don't recall any discussions about the specification in 2018, because we were dealing the water incident and the ventilation issue came into the latter part of that year. I was involved in initial design meetings with Mr Powrie and Matthew Lambert, I think, at the time. Into 2019, there's some input from Peter Hoffman, but then I resigned from the role, so I don't know what the discussions were at that point.

Q Well, I won't press you on that. What I want to do is pick up one more issue, which is, if you go to page 78 of your statement, you set out from paragraph 217 to 225 your view of the role of the IPC team in commissioning and validation. Now, I'm not going to go through that in detail. I just have one question, which is: are you aware of whether a stage 4 HAI-SCRIBE was produced-- which seems to be what's

required by the 2014 version of SHFN 03-- was produced in 2015 when the hospital was handed over by either the Project Team or Estates or IPC for the new hospital?

A No, I'm not aware of that.

Q Would you have known to look for one then?

A Absolutely, yes.

Q Did you look for one?

A No.

Q Why didn't you look for one?

A I suppose at the time I came over I had a very narrow remit, which was the regional. I didn't actually move across until middle of August. So, no, I didn't look for one at that point in time.

Q Was there a point when you did actually start thinking, "I wonder if there's an HAI-SCRIBE for this new hospital"?

A I can't recall thinking about that then.

Q Looking back on it, why?

A Well, I suppose I made an assumption that it would be in place because it was very clear in the CEL and the SHFN. I mean, it was a major construction project, so that's possibly why I didn't think to ask, because I just assumed it would be there.

Q Now, before we go on to your-- before we go on to your resignation, I'd like to just pick up issues about

Aspergillus in the wards that happen over the next-- this is in Ward 2A, over the next few years. There seem to be a number of different PAGs and IMTs that we have access to in '15, '16, '17 and onwards. Looking back on this now, to what extent do the ventilation arrangements in 2A – before it's rebuilt – have, from your point of view, any relevance to the existence or otherwise of Aspergillus infections in that ward?

A I think it's possible they were relevant. There are various sources of Aspergillus, and obviously construction and demolition is one, and that is where you need your protective environment for immunosuppressed patients plus potentially additional measures, depending what's going on on site. So, there was construction and we recognised that in the IMTs at the time.

The other issue that came to light was water damage, which is-- water ingress, which often an under-recognised and poorly managed situation. By that time, I'd had a reasonable amount of experience in dealing with water damage, and you find the same problems, in that people don't understand the need to remove all of the mouldy material. They may just focus on the tile that the water is dripping from. They don't do full inspections of ceiling voids, and they don't remove all the adjacent material,

and then that's left, and a ceiling void is a perfect atmosphere for mould to grow, and that then becomes a source.

It's a bit different from water leaking directly from a chilled beam, because fungal spores are released in bursts. So, you can have a water leak at one end of a ward, but patients at the other end are affected because of the the burst of spores and how they travel. They're very buoyant and speculated, so----

Q Would they move through the ceiling void?

A They will move through, and that's why we have measures in place for construction, because they will move very far and if a ward isn't appropriately ventilated with HEPA filtration and protection, then, yes, there can be ingress of spores. So, construction and water damage were the main issues at the time, but also the damp conditions potentially created and the dust from the chilled beams were problematic.

Q We'll come back to chilled beams later, but I'm just trying to make the connection between the discussion we've had about a Neutropenic Ward and isolation rooms and the state of understanding then about whether it should be a whole ward that is treated according to SHTM 03 or just the rooms.

Now, if the approach is taken of just isolating eight rooms or four rooms or at

one point even fewer, perhaps, and putting in the most vulnerable patients in those rooms, then surely the issue of Aspergillus risk wouldn't arise because they're in their rooms, so they're safe. But it did arise, so what's happened there? Have they left the rooms?

A So, what's happened there is-- I believe at the time some of the rooms had been closed because of issues with the ductwork, which might-- it goes back to my issue with contingency. I was beginning to think that there were patients with other conditions other than bone marrow transplants that should have been in those rooms, but there wasn't enough rooms for these patients.

So, in particular, patients with acute lymphoblastic leukemia who can become very immunosuppressed due to the nature of the chemotherapy that they get, they were certainly being managed at times in the main ward.

Q In the non-isolation rooms?

A In the non-isolation rooms, because there wasn't sufficient accommodation to move them into those rooms.

Q Isn't that another reason, or a reason, to think that "Neutropenic Patient Ward" in the context of paediatric heamato-oncology has to be the whole ward?

A Yes.

Q Because the numbers are so small that the pressures will cause these problems.

A Absolutely, and I think the other thing to consider is the paediatric setting. I observed myself that it was very difficult for children to be confined to a room for the length of time they needed to be for bone marrow transplant, and I did see patients on occasion being let out of the room and into the corridor. I can understand why, you know, that was the case.

Q Well, there were facilities for them in the ward, built there.

A Yes, absolutely.

Q There were playrooms. There was the Teenage Cancer Trust. There was family dining room.

A Yes.

Q So, is that not another reason to think we have to treat the whole ward?

A Yes, absolutely.

Q I mentioned that you resigned your sessions.

A Yes.

Q Now, what I want to do is just focus on the time of that. Am I right in thinking that there's a meeting between you and Professor Jones and Dr Peters and Dr Cruickshank on something like 9 or 8 July 2015, and your resignation letters go in after that? Have I got the order right?

A I don't recall the date of the meeting.

Q Can you help us whether it's before or after the letters go in?

A I think before, because I think I indicated my resignation and I was asked to produce what I've referred to as a sort of statement of events.

Q So you think we should read-- and we'll go and look at your letter in a moment, but you think you should read your letter and that of Dr Peters as following up a discussion with other people?

A Yes.

Q And I'm right in thinking the people you would have had the meeting with would have been Professor Jones and Dr Cruickshank?

A Yes.

Q Why them?

A So, at the time, Professor Jones was head of service for Microbiology and Anne Cruickshank was the clinical director. So, we had different line management structures. So, for Infection Control we would report to Professor Williams and Tom Walsh, but for microbiology we would report to Professor Jones and Anne Cruickshank. In terms of job planning, it would be microbiology senior staff that we would need to talk to about job planning and relinquishing sessions.

Q Because you were-- Were you full-time at this point?

A Yes, I was.

Q Yes. So, you would have had 10 sessions? You're nodding again.

A Yes.

Q You remember for the transcript purposes?

A Yes.

Q And how many sessions at this point did you have in Infection Prevention and Control?

A I think at that point for regional I had three sessions a week.

Q And the other seven sessions are Microbiology?

A Yes.

Q And so Dr Cruickshank and Professor Jones are your management, in a sense, but for Microbiology?

A Yes.

Q So, you go to them?

A Yes.

Q Right. Let's look at your letter. So, this is bundle 14, volume 1, document 27, page 416. So, is this the summary document you say you were asked to produce?

A Yes.

Q Right. What I want to do is to go through this, just to help us out – not in detail, because we can read it – but just to understand what is it that you're raising in issues? The first thing is the

first paragraph covering Professor Williams. Is this when he's in China?

A Yes, I believe so.

Q And then we've just seen email exchanges.

A Yes.

Q Could the date-- Could it be a slightly longer period, given some of the dates in the emails? Maybe that's not important, but you certainly cover for him.

A Yes.

Q Right. Then 25 June, is that the meeting with Mr Powrie that we've just looked at the minute for?

A Yes, that's correct.

Q Okay. Then at the bottom you have your concern about lack of information.

A Yes.

Q Right. Here's the next page. Then you discuss more events over the next few days, including-- I didn't see you mentioning the HEPA filters in Ward 2A in this email, but does that come at the same point?

A I have a recollection that was earlier, because patients hadn't moved in.

Q Right. That was-- If we go back to page 263. It was 3 June. Yes, it is earlier. Right. If we go back to page 417, and then there's more discussion about events of 29 and 30 June and 31 June (sic). Now, if to go over the page-- What I'm thinking here is, is effectively this a narrative about what you're told, what you're not told, and what it means?

A Yes.

Q Right. Can we go to the end, page 419? Who was this sent to, this document?

A I recall it being sent to myself and Christine Peters and John Hood.

Q Would Professor Jones and Dr Cruickshank have received it? Or perhaps they wouldn't have.

A Professor Jones may have, because he was the microbiologist for the unit. I don't believe Anne Cruickshank would have received it. I would need to check emails.

Q Were you permitted to resign these sessions, or rather "demit" them, as Mr Walsh would have put it?

A No.

Q No. If we go to page 420-- and you've set out your reasons. It's the last but one-- last three paragraphs that seem different from the previous ones. Everything else seems to be describing, "I found out something/I am concerned because," and this seems to be different. What's the point you're making in the third last and second last paragraphs?

A I felt at the time that people were not listening to myself and Dr Peters. I wasn't clear what our role was within Infection Control at the time. We were certainly not autonomous. We did

not have the ability to request information and receive it, and that was very evident from that period of time. I wasn't really clear as to what my role as the sector ICD and the person who would be, you know, involved with this unit was at the time, because it was then taken back over by Professor Williams. So, I wanted clarity on, you know, what is my role in this team?

Q Because you were only receiving----

A What do I have responsibility for? Because, you know, I stopped receiving any communication about it when he came back.

Q So, you only receive information when he's away, effectively?

A Yes, but despite it being part of my sector ICD role. So, I was confused about my role, and ultimately I was concerned about patient safety and the fact that myself and Dr Peters-- I didn't feel we were really being listened to and there was a lack of information sharing for a site that both of us were to become responsible for, and I felt it was really important to get that information.

Q I appreciate that you weren't allowed to demit or resign your sessions and neither was Dr Peters, and you continued working in these roles, but is there some form of review or investigation carried out in the points

you've raised?

A At that time?

Q Yes.

A No. I recall being informed by Professor Jones that there would be some sort of HR investigation. I remember being contacted by him on holiday at the beginning of August.

Q And eventually, do you end up speaking to Dr Stewart and an HR person?

A Yes, I do.

Q If we could go to-- What is it that Dr Stewart wanted to talk to you about? We'll take this off the screen.

A So, there had been lots of concerns raised around the time that we had resigned. There was a lot of tension in the team and Cruikshank was appointed into a new additional role as the clinical director because I think it was recognised that there were-- what was being labelled as “personality issues” between certain ICDs and they wanted to explore-- my understanding is they wanted to explore the culture of Infection Control at that time, as opposed to any of the risks that we had highlighted in our resignation letters.

Q So in your meeting with Dr Stewart and the HR person who was with him, did you discuss these cultural communications issues, relationship issues with him?

A Yes, we did.

Q Did you attempt to discuss the patient safety concerns you had with him?

A I think I did briefly to sort of set the scene as to how these issues had arisen.

Q And eventually does he send an email round, if we go and look at-- I think it's bundle 14, volume 1, document 45, page 472? Now, this is an email which you receive on 30 October. Do you remember receiving this email?

A Yes, I do.

Q Now, when he says, "please see attached letter", is that the text of the attached letter below?

A Yes, that's correct.

Q What did you think when you read this response?

A I felt at that time that this was being made about personalities. I felt that myself and Dr Peters were being labelled as difficult and risk averse and that that was all there was to see here. It was personality issues rather than any actual genuine concern that there were patient safety issues about the issues that we were addressing.

Q Dr Stewart's given evidence a few weeks ago that he was aware of the reasons you resigned, but the instruction he received from Dr Armstrong was to carry out a review of these cultural communications issues alone.

A Yes.

Q Does that match with your understanding of what he was doing?

A Yes.

Q Right. Did you attempt to go back to him about the patient safety issues?

A I did, yes.

Q So, would that be in an email-- a letter to him in early October? A long letter.

A Yes, that's correct.

Q Now, that is bundle 14, volume 1, document 48, page 478. Now, at one level, I'll be cutting it short, is there a series of emails from Christine Peters between the two?

A Yes.

Q Right, but this is a joint letter by the two of you.

A That's correct.

Q Again, we can read it, but if we read it and compare it to your note for your resignation, to what extent are they different?

A I think that a combination of issues that I was experiencing at the time, but with the addition of some issues that Dr Peters was dealing with that I was less involved with. So it's really a combination of both our experiences at the time and both of our concerns.

Q Now, why was it that you were

going back to Dr Stewart with these concerns?

A Because I could see no evidence that anything had changed and in the interim, before writing this letter, I think it was around that time I was informed that the Beatson would be moving back.

Q Right. How did that come about? How did you learn about that?

A Professor Williams contacted me and informed me that I would be leading on the move back. I would need to check the dates to be absolutely sure, but it was around this time.

Q Could this be-- If we look in the same bundle, page 296, it's around about this-- early September, and then if we go on to the next page, there's a update document that he's produced. Is this something you've seen before?

A Yes, I've seen that before.

Q So, would this suggest that the discussion of the patients moving back is in early September?

A No, so, this-- I'm referring to the Adult Bone Marrow Transplant Unit.

Q Right, my mistake. Well, I'll take that off the screen. So, you say there was discussions between-- that you received some information from him-- instructions from him about the patient moving back. What did he want you to do?

A He wanted me to lead on it.

Q Did you lead on it?

A Yes, I did.

Q What did you discover, and what did you do?

A I discovered that, in the interim, nothing appeared to have changed. So I was asked to lead on it. I asked for, "Can I have the original specification, the validation, the air sampling?" Nothing was forthcoming. At the time of the initial meeting, they actually had the keys the ward. So, they were moving in three weeks. That was the plan. I had none of this information, and I was expected to sign off that move. I was not comfortable because nobody at that point could tell me what had actually changed.

Q What had actually changed? Did you find out eventually?

A I think there was some work done to make some of the ceilings solid, and there were communications during that time between Professor Williams and Peter Hoffman that were not shared with me. So I was put in a position with no information but expected to make, you know, a major decision about moving this unit back, so I felt not dissimilar to how I'd felt earlier in the year and I then requested support from Health Protection Scotland. I wanted them to come in and have a look and to develop an optimal

specification, and when I brought them in, there was some information then-- was more forthcoming because they were asking questions and colleagues then did send some information but not all of the information.

Q Is this the process that ultimately results in the December 2015 SBAR by HPS about the----

A That's correct.

Q Right. About this ward, how was you contacting Health Protection in Scotland for support treated by management in NHS GGC?

A I think-- Well, I think there was frustration because they were ready to move the patients back. So, the clinical teams and the clinical managers had a plan for moving those patients back in and, essentially, I come along and say, "No, I'm not happy about this." So I can understand why they were frustrated.

In terms of Infection Control management, I felt at the time there was resistance from the Infection Control manager and the lead Infection Control doctor that I was bringing in Health Protection Scotland, and they referred to previous input from Health Facility Scotland. Now, to me, that input was not particularly clear at the time. It appeared to be input in relation to air sampling, but not, in fact, input in relation to the specification of the units, which was what

I wanted to get advice on.

Q I get the impression – and just stop me if I've misunderstood this – that not just you but lots of people are sort of flailing around in the dark here and slightly unaware of what's happened and what's going on.

A Yes.

Q Is that a fair analysis?

A That's correct.

Q Who else is-- I mean, frankly, is anybody fully informed about what's going on here at this point?

A I don't believe they were, no.

Q So that would include Professor Williams and Mr Loudon and Mr Powrie and all the people involved?

A Yes, everyone.

Q Let's go back to your letter-- Well, don't go back to it. We'll go back to the point of the story, which is early November 2015 when you've sent your new letter with Dr Peters. Do you get a response from Dr Stewart?

A We did get a response, and he said something along the lines, "Well, now HPS and HFS are involved, so maybe that would give us reassurance," but I felt at that time, well, they were only involved because I had to push for their involvement and they were only involved in one of the aspects on the list at the time, although I recall a conversation with Anne Cruikshank and we did suggest to

them that we might need some more input in relation to some of the other aspects.

Q Did you go back to Dr Stewart again around about Christmas time, or might it have been Christine Peters who went back to him?

A I think that was Christine.

Q Right. What I want to do is look at a report which we've got, which is a bundle 14, volume 1, document 45, page-- I think it's 464. So, this is called an "Informal Review of Infection Control Issues," which is produced by Dr Stewart and his colleague from HR. I wondered when you first saw this?

A I first saw this in a bundle for this Inquiry.

Q So you weren't provided with this at the time?

A No.

Q Even though you'd raised the issue?

A No, I wasn't provided with it.

Q And so, in terms of substantive detail, all you have was the letter of 30 October that we just looked at?

A Yes, that's correct.

Q Right. Could you look at the bottom of this page, paragraph 6? Now, I've discussed it with Dr Stewart, and he, I think, to be fair to him, doesn't have a full recollection of what this might mean, but he effectively gave a particular narrative

of what it meant, looking at it at an angle.

I wonder if you can look at the final paragraph. There seemed to be some discussions. I wondered if you could look at this-- We'll go through this paragraph and see what you think about some of the individual sentences and whether you think, in a sense, he's fair at the time or what's wrong with his views expressed. So, the first sentence, "There is a need for greater clarity around levels of accountability and decision-making process, especially when there are conflicting views/opinions." Looking back at this point, autumn 2015, is that a fair comment, or would you disagree with it?

A I would say there was a need for clarity. It wasn't clear to me what my role was at the time.

Q I will take the next sentence in two parts, "On the one hand, there are reports from ICDs having their professional authority undermined by the overturning decisions by the IC management team." Is that something you would have told him?

A Yes, I agree with that.

Q Right, and you and Christine would have told him that?

A Yes.

Q Right. "Whilst, on the other hand, there are reports of ICDs not taking decisions when given authorities to do so." Am I right in thinking that's talking

about you?

A I would imagine with the timing, yes.

Q Yes, so, might that be that you not signing off decisions----

A Yes.

Q -- that you're being asked to sign off? Now, this final sentence seems possibly important, but-- though, to be fair to Dr Stewart, he doesn't remember writing it:

> "Whilst it is clear that concern for patient safety is the primary motivator for ICDs when arriving to decisions, there appears to be on occasion to be a lack of appreciation by some ICDs or the need to risk assess decisions from an organisational political perspective."

Now, before we get to the last three words, I mean, you've already discussed the importance of balancing risk already.

A Yes.

Q So, do you feel that you were risk assessing decisions at the time?

A So, as an ICD I was risk assessing on an almost daily basis, on a very simple level whether to close a ward for an outbreak or, you know, allow the service to continue so that patients might get treatment. You're always risk assessing as an ICD, but in those sort of situations you're fully informed in your risk assessment. You've got all the information available to you, but here I

was not fully informed to undertake a risk assessment and at times relying on things like particle counts only. So it's about being informed and having all the information to hand to enable you to make that risk assessment safely, and that wasn't happening at the time.

Q Now, what about the last three words, and I appreciate you didn't see them at the time, but in the context of the IPC team of late 2015, what do you think could have been meant then by "organisational political perspective" as something that you need to consider?

A My reading of this is that organisational reputation was the priority.

Q Do you think that anything changed in respect to the culture of the IPC team as a result of you raising these issues in the latter part of 2015 with Dr Peters or Dr Stewart's report?

A No.

Q What was done about the patient safety issues you raised in these issues in the second half of 2015?

A Nothing that I recall other than me trying to address the issues with adult BMT and bringing external experts at the time.

Q Now, you've mentioned the point of Dr Cruikshank. Do you think her role was effective that she was brought in to do?

A I did find her role to be

effective. I found Anne Cruikshank was a huge support to myself and Dr Peters, and I felt that she had a very good understanding of the culture, and she was very supportive, and I felt that having her come along to the Senior Management Team meetings and Infection Control I felt did make a difference and there was more accountability I think and maybe more discussion about certain issues that might be stimulated by her. She was someone who took a lot of action. She wasn't a bystander. She was very proactive.

Q One more question before the break. Her role wasn't continued beyond May 2016. Why do you think that was?

A I seem to recall discussions at the time feeling that once there'd been a change in the lead ICD role, that she was comfortable to step aside. I think also possibly for her, you know, she was a busy biochemist and clinical director for the whole of lab, so this was, you know, an extra workload and I think maybe that was a factor as well, but I think she felt comfortable that, perhaps at that time, things might be starting to change.

Q Thank you. My Lord, this might be a good place to break for the morning coffee break.

THE CHAIR: Yes. Dr Inkster, as I've said, we usually take a coffee break about this time. Could I ask you to be back for twelve o'clock?

A Yes.

(Short break)

THE CHAIR: Mr Mackintosh.

MR MACKINTOSH: Thank you, my Lord. Dr Inkster, what I'd like to do now is turn to the completion of the story about the return of the Adult Bone Marrow Treatment Unit to the hospital. Now, you've covered it in an extremely high level of detail from paragraphs 243 to 257 of your statement and described a lot of events along that journey. What I'd like to do is simply look at the March 2017 options appraisal that goes to the Acute Services Committee of the board and pick out a few things from that, and in a sense, wrap up the topic that way. So, firstly, if we put it on the screen, it's bundle 27, volume 7, document 6, page 158. Page 158. Thank you. So, firstly, when would you have first seen this document or something similar to it?

A I would have seen that around that time, I believe, yes.

Q So, effectively, is this a report to a subcommittee of the board?

A Yes.

Q And seeking options-- giving out options for the changes that were eventually made to allow the patients to return?

A That's correct.

Q Right. Now, I wanted just to, in a sense, pick out some of your comments within your paragraph by reference to this as an *aide memoire*. If we look at this document, it seems to consist of a summary document, which is this page and the next page with the recommendation. Then, over the page, on page-- there's a report. Now, what I want to do is, using your experience that we've just touched on in 2015, I want to look at the paragraphs on background, and it's the second paragraph of background, and I wondered to what extent that paragraph reflects your understanding at the time of what the reasons for the return were, the anticipated length of the return, and indeed the following paragraph-- and the reason that the return didn't happen in 2015?

A So, my understanding is it was to be short-term, and it appeared to me that the major change was the ceilings, and----

Q So, this is in 2015-- you thought the return in 2015 was to be a short-term departure back to the Beatson?

A No, I didn't, no.

Q You didn't?

A No.

Q So, if we look at these two paragraphs-- So, the first sentence-- Is the first sentence that:

> "The unit had to return to the Beatson West of Scotland Cancer Centre in July 2015 following an interim air quality change in the new transplant unit."

Is that correct?

A I would say it was more than that. It wasn't just about air quality issues; it was a suboptimal specification.

Q But that's not there. The next sentence is:

> "The return was predicated on being short term with further remedial works to be undertaken to improve air quality in the ward."

Were the works that you saw done, that you were asked to approve, in order to improve air quality?

A I didn't approve those works at the time.

Q No, but you were asked to approve them.

A Yes, asked-- Oh, air quality----

Q Were they about air quality?

A I asked to improve the specification.

Q No. I'll rephrase my question.

A Sorry.

Q The works that you were asked to approve – because you were given works to approve; they had the

keys already – if we look at what those works were, were they-- from your perspective, did they appear be designed to improve air quality in the ward?

A No.

Q What did they look like they were designed to achieve?

A All they looked like they were designed to achieve was solid ceilings in the bedrooms. So, they didn't look to me to be achieving higher air changes or maintaining a high pressure, or having solid ceilings also in the bathrooms.

Q So, there weren't going to be solid ceilings in the bathrooms at that stage?

A I believe, at that point, there were not solid ceilings in the bathrooms, but I can't quite recall.

Q The last sentence of the second paragraph:

> "Remedial works was completed by October '15, and at this time, the service began to make plans to move back to the hospital. "

That is correct, isn't it?

A Yes, that's correct.

Q Right. The first sentence of the next paragraph, is that correct?

A I would say the Infection Control doctor rather than the team.

Q Right. Why would you say that?

A Because the Infection Control manager and lead ICD appeared to agree with the move back and allocated that task to me, which was to happen three weeks later. So, they had not chosen to question anything in regards to the specification or validation or air sampling of that unit. So, I think, at that stage, it would have been the sector ICD raising concerns.

Q The final sentence, the rather long one, that begins:

> "Following the receipt of recommendations from HPS with regard to the required specification, Appendix 1, the Infection Control Team advised the specification did not meet required environmental standards for a BMT unit and therefore they were unable to support a return to the hospital."

Is that (a) actually you rather than the team as a whole, and (b) is it correct in other respects?

A So, at that point, there was more Infection Control team involvement with the options appraisal. So, when we had been through the options appraisal process, both the Infection Control manager and the associate nurse director agreed with the Infection Control position.

Q But there was no Infection Control involvement in the options

appraisal, and you've discussed that in your statement?

A There was Infection Control involvement in the options appraisal, but we didn't agree with it.

Q With it. Then, this paragraph:

> "A further schedule of work was agreed and scoped in 2016 with additional costs of circa something, which would deliver improvements that would meet the full specification outlined by HPS."

Is that this process where you didn't agree-- that the team didn't agree with the proposed things?

A Yes.

Q Right. If we step forward onto page 166, where options are assessed, so the top option is, "Remain at the cancer centre," but option two is level 4B of the hospital. Do you see the sentence that begins at the end, "However option..." and if we go over the page, there's a report that it didn't score well against criteria to meet environmental standards. Is that an accurate way of summarising your concerns about that option during the options appraisal process, that it didn't meet environmental standards?

A It didn't meet the desired specification----

Q Yes, but do you think the environmental----

A -- and optimal environmental, you know, conditions in terms of air quality and air sampling.

Q Do you think the environmental standard really gives the full nature of the way it didn't meet the specifications?

A No, I don't believe it does.

Q If we go to page 172, the option is discussed in more detail here. Now, what I'm intrigued about here is the interplay between this 4B adult unit and Ward 2A. I'm wondering if – something I can put to you – you consider it to be a reasonable thought at the time, which is March '17. So, I recognise the benefit of hindsight might give a different answer, but looking at the time when you were lead ICD, if it's the case that the facility in 4B didn't then meet the standard in SHTM 03-01 for neutropenic rooms or HPS guidance, and the main concern is that of airborne infections, particularly invasive fungal infections due to organisms such as Aspergillus, and-- I'm never going to pronounce this right, but Zygomycosis?

A Zygomycosis, yes.

Q Due to air quality. If that's true, then look at the next paragraph. It's also true for the children's hospital, isn't it?

A Yes.

Q Where were the proposed changes to change the children's

hospital, Ward 2A, at this point, in March 2017?

A I think in 2016 I was given two options for improving the specification but just of the eight rooms. So, there were two options: either to continue with the PPVL concept and make sure the rooms were adequately sealed, or upgrade them according to SHTM 03-01. I chose the SHTM 03-01 option, making use of the anteroom. So, I asked for that to be the positive pressure cascade design I've spoken about, because we didn't have the HEPA-filtered corridor and that would provide patients with an extra layer of protection, so the lobby would be 10 Pascals and the bedroom would be plus 20.

Q But this options appraisal, unless I've misunderstood it, involves giving-- HEPA-filtering the whole of Ward 4B, doesn't it?

A Yes.

Q And the options-- two options that you are discussing for Ward 2A in 2016 only involved treating the individual rooms. So, given that the board has been told that the BMT unit in the children's hospital doesn't meet the standard either, wouldn't it have been a good idea, in March '17, to have been looking at a similar upgrade to 4B for 2A in March '17?

A Yes, I would agree with that.

Q Was that something that was being discussed beyond the options paper for the individual rooms?

A So, at the time when-- there were several meetings in 2016 to discuss the upgrade and how many rooms would be upgraded, and we were told – and it was handed over to me by several individuals that we would only be upgrading a certain number of rooms at the time and that there was no scope to upgrade anymore.

Q But the board is now aware, in 'March 17, that the ward doesn't meet the (inaudible) standards?

A Yes.

Q Now, how does this fit back to your discussion with me an hour ago about what SHTM 03-01 means for a Paediatric Haemato-oncology ward? I've been asking you two questions: one is what's the current consensus, and what's the consensus back in 2009? Given that this is, I don't know, a year and a half before Mr Lambert's work in innovative design solutions, what do you think the consensus was in 2017 about what standard Ward 2A should have been at in terms of whole ward protection?

A I believe the consensus was to leave it as it is at that point due to barriers to upgrade it.

Q What barriers would those have been?

A First of all, contingency. So, with the adult Beatson, we could move them back. We didn't have anywhere to move children to, so there was risk of shutting down what is our national service, which would mean that very sick children did not get treatment. So, that was an aspect lack of contingency; where would the children go? And the second issue that is discussed and is minuted in-- I think, later on in 2017 is the cost of doing so.

Q I wonder if we can go to page----

THE CHAIR: Sorry, Mr Mackintosh.

MR MACKINTOSH: Of course.

THE CHAIR: Do we have an answer? Your question was, "What was the consensus in 2017 as to what was required for a unit such as was accommodated in 2A?" Now, I----

MR MACKINTOSH: Yes. Well, we have the answer of what was done----

THE CHAIR: I'm not quite sure we got an answer to that.

MR MACKINTOSH: -- but what was the-- What do you think-- I mean, you were involved in the 2016 exercise in selecting two options, and I appreciate that those options were in the context of both contingency and financial pressures that would have made what was ultimately done difficult to do, but given that ultimately the patients were moved from 2A to 6A while 2A was refitted, at least that demonstrates there is an alternative; one could do exactly that. I know it's not a very attractive alternative, I accept that, but in March '17, if you'd been asked the straight question is, "You have to design a"-- Well, if you were asked the straight question, "Is this ward compliant with SHTM 03-01?" I'm assuming you'd say, "No, it's not"?

A Yes, correct.

Q Right. If you were asked, "What do I need to do to get this to compliance?", what would you have said?

A I would have said that-- Well, all the rooms would need to be upgraded to HEPA-filtered rooms, exactly the same specification that Health Protection Scotland provided for the adult BMT room with a HEPA-filtered corridor, with a protected double door entry. That's what I would have asked for.

Q But your reason why it wasn't done is to do with the capacity contingency and the cost?

A Yeah. So, later in 2018, the Beatson had moved across and we were able to utilise bone marrow transplant beds in that unit for the children.

Q But that wasn't an option that was available in----

A It wasn't available then, and we couldn't send them anywhere else. We couldn't send them over for

transplants to the Beatson because there's no paediatric services on site and there's no paediatric critical care.

Q Now, the final thing before I take us away from this document is, if we go to page at 175, we'll see the recommendation from HPS pasted in here, as it were. In the middle of that, "bedroom air changes of 10 air changes an hour must be achieved." As far as you understand it, in March '17, at the end of the options appraisal, had it been realised by that point, that 10 air changes could not be achieved with the ventilation system?

A Yes, it had.

Q Right, thank you. Now, we'll take that off the screen. I'd like to make a brief return – not that we've really been there before – to water, and I'd like to turn to the-- to paragraph-- page 205 of your statement, and at paragraph 5-- No, I've done that wrong. To page 164 of your statement, yes, to paragraph 506. Now, you've described in your statement in a number of places the incident with the aseptic pharmacy in January '16.

A Yes.

Q We've also heard evidence from other people who are present. What do you think the principal learning lesson is from the way-- from this incident about the way the Infection Prevention and Control Team was functioning at the time this incident occurred in January '16?

A So, at the time I didn't feel it was functioning particularly well in terms of the team and relationships with Estates. The aseptic pharmacy, they have their own guidelines for water testing and they were having problems, and they were not getting support with those problems, they felt, from local Estates. When I talked to Professor Williams at the time, he said it was an Estates issue so there was a sort of debate as to who was to support this aseptic pharmacy, partly, I think, because they weren't following recognised water safety policies but their own guidance – called the Orange Guide – at the time, and I was asked to help them by the biomedical scientists in Glasgow Royal who could see the results and could see that they weren't getting any help. So, I gave them some support starting in February of 2016.

Q Now, if we think about this series of cases in January '16 in the context of what is to come, might it have been possible to realise at this point that there was an issue of water contamination or systemic contamination in the water system at this point, and if so, what would you have needed to know to work that out at the time?

A I don't believe so at the time. They were doing routine monthly testing.

They had elevated TVCs. I asked for the lab to identify the organisms. It was Cupriavidus. We did a review of the unit, Pamela Joannidis just did a lot of work reviewing the units, and we found reasons why there might be an issue. So, when you're thinking about a contaminated water system, it's not necessarily systemic. It might be related to the actual periphery of the system where these organisms are more likely to be found, and the reason it might be related to the periphery of the system is things like a lack of flushing, a lack of tap maintenance or, in fact, practice, so discarding, you know, disposing of bodily fluids down sinks, that kind of thing and----

Q And in this case, there was a particular sink that caused some anxiety in this?

A Yes, so, there was what we would call "a little-used outlet". So, there was a sink in a changing area that was not being used by staff, so we took that one out and that left us with one remaining sink. Pamela, I think, had witnessed – and it's reported in minutes somewhere – that there was disposal of, you know, waste inappropriately down sinks and there were some practice issues. We also had repeat testing, so we did some work around dosing. We disinfected the taps, and then we put in a programme of repeat testing and those results remained negative and in fact did so right through. Even in the 2018 incident those results were still negative, so at that time it looked to me like there was a local outlet issue that was explained by a little-used outlet and practice. I wouldn't have thought at that time for a new hospital to have a systemic----

Q And so you're not saying you think you could have worked it out if you'd known more?

A Oh, I mean, if I'd had access to DMA reports then absolutely, but I didn't.

Q Well, we'll come back to what you might have done with the reports when we get to them in the story, but I wonder if we can go to Bundle 13, document 71, at page 533, which is a meeting of the IMT Senior Management Team from 25 February 2016. I notice that Mr Walsh is in the chair, and that you're present as ICD regional. In fact, is that a handy who's-who in IPC at that point in time? Are there any major people in there without a job description who's missing?

A No, I don't believe so.

Q All right. Well, what I want to do is go to page 536, and I'm just going to make sure I've got my notes. Here we are, yes. Item 8, subgroups, Assure Light working groups update, and the first one

is water safety group, and Pamela Joannidis is in the first paragraph advising about an annual review of Pseudomonas, and then in the second paragraph Teresa-- I take it that's you.

A Yes.

Q And you reported that there were no water risk assessments for the new hospital, and with regards to Legionella, "the paediatric BMT does not have this listed as a risk." Now, we now know that there were water risk assessments for the new hospital.

A Yes.

Q So, why did you think at this point in February 2016 that there were no water risk assessments for the hospital?

A Because we had been asking for them amongst other things and they weren't being produced and we didn't have validation reports either so----

Q Well, let's stay with the water risk assessments for the moment.

A Yes. It-- The impression we got was they didn't exist.

Q Who had you been asking?

A So, there were a series of emails. Christine had been asking, I believe, Mary Ann Kane, Tom Walsh, Ian Powrie. I had asked Ian Powrie and nothing was shared with us.

Q And so you basically had done some research. I'm just checking. That's what I'm effectively checking, and that's your research. You've asked Mr Powrie, Mary Anne Kane----

A Yes.

Q -- and Mr Walsh. Now, it may be that Mr Walsh didn't know, but we've asked Mr Powrie and we discussed it with him. Now, what I want to do is-- You were to meet Mr Powrie to discuss this. What was the response when you went to see Mr Powrie to discuss this?

A So, this was the second meeting with Mr Powrie. I'd previously met him, and that's when I highlighted the Legionella paediatric BMT risk, so I'm reporting back on this meeting at the time. I recall asking him for two things, Legionella risk assessment, but all the historical Legionella results, because there had been a meeting set up in December of 2015 to go over those exact things and it had been cancelled, and the response I got at the time was that someone else was dealing with it.

Q And is it as a consequence of this meeting that you produced the out of specifications list?

A Yes, so that was the first meeting that I had with him in early February. That's when we produced that.

Q **Y**ou produced that. Now, what I'm intrigued by is you're now having a meeting with him in which you're discussing a piece of work. It's not just an enquiry. Your out of specification –

what Mr Clarkson refers to as the “Inkster Powrie list”, as it were – that is produced. Where does it go?

A No, sorry. That's a different document. So, that came later during the water incident.

Q I see.

A That was a document designed to make a decision as to whether point-of-use filters could come off. What I'm talking about is the notification of Legionella results by exception reporting to ICDs, because I'd obviously come from the Royal and that wasn't in place at that point----

Q So, this is purely who gets the information as opposed to what is tested?

A Who gets it and when to send it.

Q Right.

A Yeah.

Q But you still don't get told about the DMA Canyon report at this point.

A I was told someone else was dealing with it.

Q But what I'm trying to say is were you told anything about whether it existed?

A I'm sure I asked them for Legionella risk assessments and Legionella water results and the response I got was, someone else was dealing with it, and that was the sort of line that myself

and Christine Peters were given. I was also-- I recall being told that at a Water Safety Group as well. It was always that someone else was dealing with it, so we were not autonomous. It wasn't the case that we could ask for risk assessments or validation reports and get them. We were not getting them because someone else was dealing with it.

Q So, what difference would it have made in early 2016 if you had known what's in the DMA Canyon report from 2015?

A I mean, if I'd known about it then-- are you talking around the Cupriavidus incident?

Q Yeah, round about then.

A Yeah, yeah. Oh, well, I would have assumed that there was a systemic problem and done much more water testing to try and demonstrate that, yeah.

Q There wasn't an awful lot of water testing being done in 2016, was there?

A No, there wasn't.

Q Why was that?

A I think it goes back to guidance and what was in place at the time. So, there's obviously the Legionella guidance. There was a Pseudomonas guidance, which I've highlighted was different in Scotland than England. Nevertheless, we did start rolling that out at the time, and apart from specialist units like aseptic

pharmacies, or renal, or hydrophil's, who followed their own guidance, that was the testing that was done at the time in conjunction with available guidance.

Q So, the production of an L8 risk assessment in January/February 2016 would have caused you to start testing water?

A Well, much more than that, though. I mean, I think if I'd seen the content of that, I would have recommended a whole range of control measures. It wouldn't just be about the water testing.

Q What sort of control measures would you-- do you think you would have recommended?

A Given the findings of that report and the recommendations of the report and the likelihood of systemic contamination, I would have suggested at that point a chlorine dioxide system, which is what I had queried a year or two before at the Infection Control doctors meeting. I had asked about water control on the site, and I was told it was temperature and it will be fine for 10 years, and I asked at that meeting, “Do we at least have the capability of dosing with chlorine dioxide if we need to?” So, I was concerned further back for a hospital that size and all the specialist units within it that we should have had, you know, a second, you know, system in place and

not just be relying on temperature control. So, I would have asked for that had I known about the risk assessment at the time.

THE CHAIR: Right. Dr Inkster you've got rather ahead of my noting.

A Sorry.

Q Now, the question is, had you, in the beginning of 2016, I think, had available to you the DMA Canyon risk assessment-- Legionella risk assessment of 2015? I think you said, "If I'd seen it, I would have recommended other controls." Now, can I just get what these controls would have been?

A So, I would have recommended a chlorine dioxide dosing system.

Q Sorry?

A Chlorine dioxide.

Q Oh, right.

A I would have also put measures in the most vulnerable units, so by that I mean what we call augmented care units which are, you know, defined in the Pseudomonas guidance. So, these are things like Critical Care Units, Neonatal Units, Haematology Units.

Q Right. Now that's the answer---

A Oh, and other things too, like basic infection control precautions, because if the water results were coming back with bacteria in them, you have to

obviously target the routes of transmission as well, so I would be ensuring that the infection control practice was of a high standard to block those routes of transmission.

Q And when you say chlorine dioxide, is that dosing of the whole system?

A Yes.

Q All right. Thank you.

MR MACKINTOSH: Right. I'd like to move on, if possible, to the-- your appointment as lead ICD. So, you've explained in your statement, at paragraph 460 and indeed at paragraph 18, that you were appointed in April 2016 as lead ICD.

A Yes.

Q Am I right in thinking that's 100 per cent of your job plan, or how was it divided up with Microbiology?

A It wasn't at the time, so the lead ICD role was two sessions a week, which is one day a week, and then I had three sessions for sector ICD. So, I moved from regional to cover the Children's Hospital at that point, so five sessions for Infection Control and five for Microbiology.

Q So, just if we were to go back to the documents on the screen, actually, and go to the beginning of that document which is-- yes. If we just look at the characters present, if we just focus on the doctors for a moment, you were-- you became lead, and so when you became lead, you had five sessions.

A Yes.

Q And if we look at Dr Peters, and Dr Balfour, and Dr Bagrade, and Dr Chang is-- just picking them out, as it were, at random, how many sessions on average would they have had each?

A So, in total that time I think we had 18 sessions available. Dr Bagrade I know was on four, and then the remaining nine would have been split between the others.

Q So, you were the one with the most sessions?

A Yes.

Q Right. If we take that off the screen? What I want to do is to look at-- pick up the issue of Ward 5C, Infectious Diseases. So, if we look at bundle 14, volume 1, page 88. So, it's a letter on 6 May to you from a group of infectious diseases consultants. Now, I appreciate that this is-- I want to make sure I'm talking about the right ward here. So, if we go on to the next page, we see the start of the letter, which is Ward 5C. How does Ward 5D relate to this story, or is it just not involved?

A I think they had patients on both wards at the time, I think. I can't quite recall.

Q So, what was missing-- I mean, we're not going to go through this

in detail, but what was missing in their minds in their wards in terms of physical facilities?

A So, they had come from the Brownlee Centre which, as they described, was purpose built. It had at least four negative pressure rooms for isolation of patients with airborne infection. Those were at one end of the ward, which meant that that area could be relatively contained from the rest of the ward, and importantly there was distance between patients with airborne infection and the immunosuppressed patients that they would treat, patients with HIV. So, that was the----

Q And they'd be at the other end of the ward?

A Yes.

Q Right.

A And they had come from the purpose-built unit to a general ward, so there was no infectious diseases unit for them. What they had available to them were some of the isolation rooms in Critical Care, which were the PPVL rooms, and at the time of the supplement document on PPVL rooms, there was an exclusion for certain airborne infections, which is a bit vague, but that was the concern is that they had come from a hospital with four negative rooms for airborne infection to one with a handful of rooms in a Critical Care Area that we

weren't sure if those were suitable for infectious diseases.

Q Firstly, where was the Critical Care Area?

A It was on level 1.

Q So, it's four levels down, below the ward?

A Yes. So, there was a challenge as well in terms of experienced staff and who was going to be nursing these patients, because I think at the time it might be falling to intensive care nurses who don't have the infectious disease expertise that those nurses had.

Q And if we just recap on the difference of the wards, a negative pressure ward-- room would effectively cause the air always to be going into the room.

A Yes.

Q And what's the situation on the positive pressure ventilation lobby rooms from your point of view that's concerning?

A Well, it was going back to the email from Peter Hoffman. So, he was concerned about, “Is a room really neutral or not?” There's always going to be leakage in one direction depending on whether it's positive or negative, to a degree. That's a serious concern when you have an airborne infection like TB, chicken pox, measles or a respiratory virus, because then you're putting other patients in the unit at risk but you're also

putting staff in the corridor at risk as well.

Q So, if we can go to an SBAR which I want to look at, which is bundle 4, document 10, page 49. It's really just to sort of connect this together. This is your SBAR?

A Yes.

Q Now, let's look at the chronology here. You become lead ICD in April. The consultants write to you on 6 May, and you do this SBAR in May. Am I right in seeing a connection between you arriving and them writing the letter?

A That's what I felt at the time, yes.

Q What do you think the connection is?

A I was aware that they had previously raised concerns with my predecessor, and----

Q So you-- Sorry, carry on.

A I wondered whether they were taking the opportunity for-- someone new coming into it might be able to support them in making changes.

Q So, effectively, what are you recommending in this SBAR in May '16?

A I'm basically recommending that we need negative pressure rooms on the site for the isolation of patients with airborne infections.

Q Were you aware of whether there was a clinical output specification

produced for an Infectious Diseases ward for this hospital before it was built?

A I don't believe so, because at the meeting myself and Christine Peters had the previous year----

Q This is the meeting where someone from Brookfield was present?

A Yes. They were very surprised to learn, but also----

Q To learn what?

A To learn that there was an infectious diseases unit on site, but also, when I was discussing with the director of facilities about trying to get these rooms progressed, I was told that we got what we asked for.

Q Well, can we look at some emails, which I think includes some people in this exchange, which is on bundle 14, volume 1, page 101? This appears to be an email from Dr Armstrong on the previous page. If we go over the page to page 102? Sorry, previous page in terms of the email, on 18 May 2016. What's going on in this thread which you provided?

A It's a thread that follows on from the SBAR that I've provided to them, so it's their response to that. There's discussion as to whether we need these negative pressure rooms or not. I felt there was challenge at the time from the director of facilities who----

Q Sorry, who's the director of

facilities at this point?

A Sorry, that's Mr Loudon, who – and I think in one of the emails in this thread – is challenging me with regards to MERS and MDRTB, saying that at the time they were not known about, and I point out to him that in fact----

Q That's page 101.

A Yes.

Q So, we see that, "Were both MERS and MDRTB known to the board when the design was signed off? I'd guess not." Is that true?

A It's not just about MDRTB, it's all TB, if you can possibly put those patients in a negative pressure room, but the problem that we had in Glasgow was not just MDRTB, we had had a case of XDRTB, which is extreme drug resistance TB. So, he was inaccurate with that statement.

Q But MERS probably was a new thing back then.

A MERS would have been a new thing, but the thing is there's always the risk of an emerging threat. I mean, we've learned that from the pandemic. That's always a risk, and my point was that, in a busy acute hospital like the Queen Elizabeth, anyone can turn up at the front door in A&E with a new and emerging threat or MDRTB, and we didn't have anywhere to put them.

Q It seems-- Is it the case that what ultimately happens is a protocol is produced to send these patients to a different hospital?

A Yes, we had to divert them to other hospitals with facilities.

Q Is that not a prudent course of action?

A Well, there's risk in doing so, because these are highly infectious patients, so there is risk in having these patients transported to the staff involved in the transfer. It's particularly complex for paediatric patients, because there wasn't really anywhere for them to go and there were anxieties about having young children in an adult setting and there wasn't, you know, the staff to go with these patients elsewhere in Scotland.

Q If we just again play hindsight and go back to the point when the decision was made to move this unit into the hospital, am I right in thinking that one of the reasons it came is because the Critical Care facilities were going to be here in the new hospital?

A I believe so. It had been at Gartnavel for a long time with no Critical Care facility on site, but they did have a High Dependency Unit. So, a level of support could have been provided to those patients, but my understanding is they didn't have that either.

Q Do you know what's ultimately happened to these two wards in terms of

this provision of rooms?

A Well, up until the point I left, they did not have any isolation rooms.

Q And they were transferring patients to other hospitals?

A No, so they were using the refurbished rooms in the Critical Care.

Q And some of those are different?

A Yes. So, some of those are negative pressure rooms that we refurbed; some of them are your positive pressure ventilated lobby rooms, but the preference would be to put an airborne infection in a negative pressure room.

Q Thank you. What I'd like to do is to go to – take this off the screen, please – the realisation that there might have been something different about the ventilation in the general wards. If we look at your statement on page-- paragraph 359 on page 121-- 121, please.

You discuss how you had been trying to establish the specification of the general hospital rooms in the hospital when you started as lead ICD. Should I see a connection between the realisation that was, in the eyes of the consultants there, an issue with the ventilation in 5C and this desire from you to establish the specification? How does that desire to establish the specification come about?

A I was informed by Christine

Peters who I believe at the time was working with the cystic fibrosis consultants, and I think she was discussing cases of Mycobacterium Abscessus, and I think that's how it came to light that the air changes were reduced.

Q So, you think she would have worked something out and spoken to you?

A Oh, yes. I'm sure she told me, yes.

Q And then do we see an email, which I'd like to ask you to look at, which is bundle 20, document 68, page 1495? Now, it's probably better we can make this wider. Thank you. So, this appears to be an email from Mr Powrie to you on 26 May 2016, and what is it that this is telling you that was news to you at the time?

A So, I had an awareness that the air changes were reduced, but in order to actually do anything with that and escalate it higher in the organisation in the form of an SBAR, I actually needed to establish the fact and see it for myself and get an understanding of what the design was and the decisions at the time. So, I think the previous email, I'm referring to needing something from him. I think I had to email him a couple of times just so that I could get the full picture and put enough content in that

SBAR.

Q And did you have the opportunity of reading the attached documents?

A Yes, I did.

Q I've just realised I've not put that in the document list, but I want just to find that for you. Can we go to bundle 17, page 2859? 2859, please. 2859, thank you. Now, am I right in thinking that until you got this email from Mr Powrie, you wouldn't have seen this before?

A No.

Q What did you think when you read it?

A Very surprised.

Q Why were you surprised?

A Because I was aware of the SHTM 03-01, which recommended 6 air changes for a general ward.

Q And do you think that this document, over two pages, provides a sufficient justification for not delivering 6 air changes an hour in general wards and single rooms?

A No, I don't. No.

Q Why?

A Because there's no patient risk assessment within it.

Q So, what would that have involved?

A What's the risk to the patients by undertaking this strategy that is

essentially a derogation from SHTM 03-01?

Q And within it, is there anything in terms of the sort of factual matrix that's in this that's a little bit unusual?

A Well, for me at the time, I didn't know what chilled beams were.

Q Right.

A So, that stood out to me. I hadn't come across chilled beams before.

Q Well, you've been in a hospital with them for a year and a half.

A Yes. I hadn't associated them with a low air change rate.

Q So, presumably you'd seen them when you'd been looking at Aspergillus in the ceiling voids.

A No, I had, and I had one in my office, but I didn't understand that they linked, that they were designed to reduce the air change rate in terms of energy efficiency.

Q Or could it be they were designed to work with a lower air change rate?

A Yeah, they were an energy efficiency----

Q So, chilled beams was novel. What about the temperature target in the penultimate paragraph on this page of 26 degrees? Where's that come from?

A I'm not sure about that.

Q Is it anything that you've noticed before?

A No.

Q Because I just wanted to ask you about something I've noticed, which is if we go back to SHTM 03-01. So, that's Bundle 16, page 483. We're there already. The top row, I think, is the general ward we're referring to. Is that right?

A Yes.

Q Yes, it requires-- How many air changes now are required for general wards?

A Six.

Q Six, and what's the filter type?

A It's a G4, so it's much lower grade than a HEPA filter.

Q Right, and then there's no requirement on any particular pressure gradient?

A No.

Q No. So, the first thing to look at is the temperature range, which is 18 to 28. Now, I just wondered, what would be the consequences-- or can you tell me, but if you can't, please do-- please tell me you can't do this, of setting a lower maximum temperature in a ventilation system?

A Do you mean less than 28?

Q Yes, so, it's 28 there. If we go back to the previous document in bundle 20-- sorry, bundle 17. Penultimate paragraph, the requirement is 26 degrees. Has anyone ever given you an explanation of why the paragraph was 26 degrees?

A No.

Q No. If we go back to bundle 16 again? So, what would be the justification that you would expect to have seen to allow for a lower than six air change rate in a general ward. What would you have wanted to see in terms of detail?

A A risk assessment for the patients, but my concern is I wouldn't have done that if I'd been involved in that risk assessment. I wouldn't have accepted less than six air changes.

Q Have you ever found out who, in terms of the Health Board, did accept it?

A No.

Q No. While we're here, on the subject of assessing risk, obviously top ward-- top row, general ward, you've just explained that in order to derogate from that air change rate, you would require some form of risk assessment. We discussed a few lines down a Neutropenic Patient Ward, and you've discussed how the consensus in 2009 might have been that that only really was required for individual rooms. Now, you're nodding again. What I understand is-- Why would some form of risk assessment not have been required to not apply the Neutropenic Patient Ward

standard to the whole ward back in 2009?

A Do you mean the 4B?

Q Well, yes, 4B, 2A, wherever there's neutropenic patients.

A I think because the interpretation of the guidance is-- I think it's vague. I think it's subject to misinterpretation, such that people might not realise they had to do a risk assessment. They didn't realise that they were derogating from anything.

Q Do you mean the people doing the general ward one or the people doing the neutropenic patient one?

A The neutropenic patient one, but the general ward one, I think, is very clear: standard six air changes per hour. So I would have expected a risk assessment with that. I think there was consideration in an email trail around the renal outpatient clinics. So, in a low-risk setting-- It might be acceptable in certain low-risk settings, but you would still expect to have a risk assessment in place for that decision.

Q Okay, if we can go to your SBAR now, it's bundle 4, document 11, page 52. This is probably the last thing we'll do before the lunch break. So, you produced this SBAR in June 2016. I'm assuming this is because you've seen the Mr Powrie email in the documents we've just looked at.

A Yes.

Q Right. What are you trying to achieve by means of this SBAR?

A So, this, for me, is a means of communicating with senior staff within the hospital. So, I would send this to the HAI executive lead and the Facilities director and the Infection Control manager to alert them to this issue.

Q And what are the recommendations that you have?

A So, the recommendations are there. Now, this is slightly different in that, when I discussed with Ian Powrie, trying to retrofit air changes would be extremely challenging in a hospital that size. It would be major disruption The duct work was not sized appropriately to enable that. There would be no contingency or anywhere to put patients. So, instead of advising retrofits of an almost entire building, all I could do in this situation was to put what I would refer to as risk mitigation in place, and that was very much focused around aerosol generating procedures where you would want to have higher air changes for dilution. So it was about protecting staff in those rooms.

Q If we just go on to the next page, please. No, go back again. I want to just check there wasn't anything beyond. The reason I did that is because so far, and please tell me if there's something I haven't found, this is the only

document post Mr Powrie's email in which someone suggests mitigations or risk reductions as a consequence of it being discovered that the air change rate was under three.

A So, there should be information and Infection Control SOPs around these recommendations.

Q So that's where we should find them all?

A So if you were to look at the SOPs, for example, influenza, respiratory, RSV, there should be in those SOPs a recommendation to have this two-hour, what we call, fallow time to enable dilution of airborne contaminants.

Q Because other thing thing that's I suppose the problem with – I mean, this may be a very unfair criticism of your paper; I think about two minutes more on this, and we'll come back to it after lunch – is it's very, very specific. So, one requires the doors to rooms to remain closed. Now, that's quite a high high-level-- Everybody has to follow that, don't they?

A In the designated areas in the assessment.

Q Yes. So, will it be in every single SOP for all those wards that the doors to rooms remain closed?

A I would doubt it. I think this relates to education of the ward staff. So, after I got the email from Mr Powrie I

arranged a meeting with individuals from Infection Control, so Dr Peters but also the two lead ICNs for the hospital, Lynn Pritchard and Pamela Joannidis to discuss these measures. So, I'm not sure if the door closing did get into the SOPs, but the two hours.

Q No, because the thing that worries me about it is I appreciate that if you're doing an aerosol generated procedure, you might read the SOP or your manager might read the SOP if you're nurse or another clinician. If you're just generally in the hospital as a member of staff, how do you know after this SBAR that doors to rooms should remain closed?

A You don't. I mean, I think you're relying on staff generally who are undertaking AGPs to know to do that, but I accept that that's not reliable.

Q Because one of the things that occurs to me – and, again, I'm happy to be corrected either by you or witnesses between now and next Thursday – the fact that there is only 2.3-- two and a bit to three air changes an hour rather than six isn't widely acknowledged by the Health Board, is it, at this point?

A Not at that point, no.

Q So people using the hospital at all – patients, staff – they don't know that they have to do some things, do they?

A Yes, absolutely.

Q You have to tell people there's a problem in order to get them to mitigate the risk. Would you accept that?

A Yes, I accept that.

Q The other thing is, as you've identified, this is about-- this SBAR focuses on patient placement and the high risk areas and those sort of topics. Is there anything you feel that should have been done by other people higher up in the organisation to mitigate the risk for patients in general?

A I mean, in terms of the building, it's difficult to know what could have been done given the issues with the duct work and air handling units----

Q Because what I'm----

A -- but in terms of, I suppose, rolling this out education wise, then potentially yes.

Q Because one of the issues is that you have patients in 2A and 4B who are quite immunocompromised, and they might go elsewhere in the hospital for procedures.

A Yes.

Q I don't get the impression that you've addressed this in the SBAR here.

A No, I didn't.

Q No. Is that addressed in SOPs that we can go to find?

A I'm not aware of any, no.

Q No. I think, well, this is probably quite a good point to stop for the lunch break. Thank you, Dr Inkster.

A Yes, Dr Inkster, will take our lunch break and if I could ask you to be back for two o'clock.

A Okay.

(<u>Short break</u>)

THE CHAIR: Good afternoon, Dr Inkster, Mr Mackintosh.

MR MACKINTOSH: Thank you. Dr Inkster, if we can go back to your SBAR of June '16? That's Bundle 4, page 234. It occurred to me that there's probably one extra question I need to ask. If we could look at the bottom half of the page, please? 234. Bundle 4, page 234. Sorry, page 52. My mistake. Now, this is the SBAR that we discussed before the lunch break in which you react to the air change rate news that you received from Mr Powrie. What I notice is no discussion of the impact on Ward 2A in the Children's Hospital. Am I right in realising that this isn't addressed in this SBAR?

A No, it's not. That information came later. There is an email somewhere where I ask him to confirm whether or not that was the case in the Children's Hospital as well.

Q So, you didn't draw the conclusion from the Powrie email and from the ventilation strategy argument? Did it apply to the children's hospital too?

A No, I didn't, I guess, because they were two separate buildings. I wasn't sure if the strategy was universal across both of them, so I wanted confirmation from him.

Q So, this is about-- We should read this as being about the adult----

A This is about the adults.

Q Okay. We can take this off the screen.

THE CHAIR: Now, there may be an issue about not hearing. There's certainly an issue here about not hearing. Ms Laurie, would you like to----

MR MACKINTOSH: It's been resolved, my Lord.

THE CHAIR: It's been resolved?

MR MACKINTOSH: The screens are now on, so we've----

THE CHAIR: Well, thank you for the intervention, even though I didn't actually hear what the intervention was.

MR MACKINTOSH: So, now that we have the screens appearing for the benefit of core participants, counsel and solicitors, if we return to the subject of this SBAR of June 2016, page 52 of Bundle 4, if that's about the adult hospital, did you do an equivalent SBAR about the children's hospital?

A No, I didn't. I gave the same instruction to Infection Control, but I didn't do an SBAR.

Q So, what would that instruction

have been? The one about the two hours window?

A Yes. The same.

Q So, if we go back to our conversation about neutropenic wards and indeed your later concern about patients not staying in their rooms, effectively-- I realise that's a shorthand. What would be the impact, in terms of risks to patients in 2A, outside the isolation rooms of an air change rate of three, or potentially a bit less, air changes per hour in Schiehallion?

A So, there wouldn't be as rapid dilution of airborne contaminants. So, where that would be important would be particularly in relation to outbreaks of respiratory viruses. So, for example, if a staff member went into the room and they coughed----

Q But what about if a staff member just walked along the corridor and they coughed?

A It would depend on the pressure of the rooms.

Q You see, it was-- the concern that I'm trying to capture is that if you take a-- if we go back to the adult hospital for the-- just for simplicity, and you take a general ward, like 6A was then a direct older person's ward. You're nodding. Again, remember the transcript person.

A Yes.

Q The rooms are separate, but

there's no pressure differential and there may not be a seal between the room and the corridor. Have I got that right?

A Yes.

Q Right. So, if you've got three air changes an hour in the rooms and three air changes an hour in the corridor, the risk-- one risk is what's happening in the room, and that's the two hour wait?

A Yes.

Q Yes, and the other risk is that something is in the corridor and that gets either into the rooms or a patient meets it when they leave their room to go somewhere else in the ward?

A Yes.

Q Right. Now, in that general ward, using 6A as an example in 2016, apart from the two-hour gap instruction that you've put in the SBAR, what are the other risks to general adult patients? So, it's outside Ward 4B/4C, are they only having three air changes an hour?

A So, they're at risk of a greater risk of infection because you don't have the airborne-- the dilution of airborne contaminants.

Q But they're not neutropenic or anything close to that normally?

A No, but you don't have to be neutropenic to acquire a respiratory virus.

Q So, you're worried-- that would be your worry?

A Mm-hmm.

Q If we take that over to Ward 2A now, you've got the four or eight-- At this point, how many working isolation rooms were there in Ward 2A?

A Sorry, what year is this now?

Q 2016.

A 2016, there would have been eight.

Q Right, so, eight working isolation rooms. So, in those rooms, the patients have got HEPA filters, yes?

A Yes.

Q They've got a positive differential between the room and the corridor?

A No, because they were still PPVL rooms at that point in time. So, a positive differential between the anteroom and the corridor.

Q Are they sealed?

A Yes. They had been sealed. That work had been done.

Q And do they-- They have HEPA filters?

A Yes.

Q What's the Air Change Rate in the eight isolation rooms?

A Ten.

Q Ten. So, that risk is unaffected by your understanding-- The risk in the isolation rooms is unaffected by your understanding about the general ventilation. Am I right?

A There's still a risk because

these patients are so vulnerable, even with an air change rate of 10, that they might be susceptible to a respiratory virus from a staff member who's coughing, but that risk is mitigated to a degree with a higher air change rate.

Q But your understanding of that risk is not affected by you learning of the three air change rate in the rest of the hospital?

A No. Not for those rooms.

Q No. So, you then take the corridor in 2A and the other rooms in 2A. What risk is discovered, as it were, in the corridor and in the other rooms in 2A when you realise that it's only three air changes an hour, as opposed to six in the the rest of the ward?

A So, obviously we discover the risk of slower dilution of airborne contaminants and, in response to that, around 2016 when dealing with the Aspergillus incident, we looked at the pressure in the rooms, and it was confirmed at the time of being +2 pascals which isn't, obviously, anywhere near 10 but it is a degree of positive pressure. It wouldn't be possible really, I don't think, to go above that because of the situation with chilled beams in the ceiling. So there was a degree of positive pressure.

Q So you took some reassurance from that?

A I took some reassurance from

that. The other thing that we did was upgrade the filtration, I think, as close to HEPA as we could, but we couldn't-- HEPA filter. So, there was some adjustments, but I accept that those weren't, you know, optimal, but we did put some mitigation in place.

Q Right. We don't find them in the SBAR, but that's an instruction you gave?

A Yes. So, there's discussion, I think, in minutes around an Aspergillus meeting in 2016 where Ian Powrie is going over the ventilation issues and we talk about pressure, and I think there's a series of emails before that where my colleague was involved as well and we discuss the positive pressure.

Q So, some steps are taken?

A So some steps, yes, but not in the SBAR.

Q The SBAR. Okay. This is an adult SBAR?

A Yes.

Q Well, that's very helpful. What I want to do now is to move on to thermal wheels, which you deal with on page 133 of statement. This is 133, paragraph 395 and 396. You have, in 396, your understanding that there's a risk of a mixing of supply and extract air, although it's likely to be a small amount, and such mixing would not be desirable in housing immunosuppressed patients. Why do

you say there would be this risk of mixing?

A That's what I was told at the time. I'm not a ventilation engineer. I was told that at the time, when the innovative design solutions report was released, that there was a theoretical risk of mixing the dirty extract with the clean supply.

Q Are you aware that NSS plans to undertake a literature review on this topic?

A I'm aware that it's on the list of topics for research because I've got the output from various research workshops, and thermal wheels are on there. I'm not familiar with what stage that's at but, yes, I'm aware they plan to do work on that.

Q I'd like to move on----

THE CHAIR: Sorry, again. Just so that I'm following that. That's on ARHAI's or----?

A Yes, NSS is research.

Q Sorry?

A NSS.

Q NSS. Thank you.

MR MACKINTOSH: I was proposing to move on to the Elizabethkingia Miricola incident in 2017, which you discuss on page 174 of your statement. Now, you've reached a conclusion in this that the risk of the link to the environment is highly likely. Do you see that? "Linked to the environment: highly likely"?

A Yes.

Q What I want to understand is-- You've also said it's a waterborne organism.

A Yes.

Q Where was this water coming from in this hypothesis?

A Two possibilities: the water from the taps or the water from the chilled beams.

Q Now, by the point we get to-- So, the way I-- you've just explained is that, in April 2016, you hadn't realised what a chilled beam was?

A Yes.

Q So, am I therefore right in thinking that before April 2016 there were no reported instances of condensation or leaks from chilled beams that you were aware of?

A Not to me because, up until that time, I was really just covering regional and the Beatson. So, not before I took on the lead ICD role, I wasn't aware.

Q What were you learning when you took on the lead ICD about chilled beams as a source of water?

A When I got the information from Mr Powrie, I was aware of how chilled beams functioned, but I wasn't necessarily aware of this phenomenon of condensation happening because that

should be-- there should be, I think, what's called dew point control.

Q Was there dew point control on these?

A I believe there was not. I believe that was one of the issues that was uncovered.

Q So, if it's coming from the chilled beams, in your mind, what did you do about that in March '17, following this PAG?

A We tested the chilled beams. We swabbed them, and we tested the outlets, and we didn't recover the organism, but Elizabethkingia Miricola-- at the time of this incident there had been communication from, I can't remember exactly who, around identification of this bacteria. Labs were misidentifying it as another Elizabethkingia Meningoceptica and only reference labs could identify Elizabethkingia Miricola. So, it was challenging for a normal lab-- or impossible at that time really for a normal lab, to name miricola. It had to go to a reference lab. So, thinking then about water testing, it would be highly unlikely that at that point in time we could have actually assigned a name to that organism. Am I explaining this okay?

Q No, no, you are. So, basically, you have the Elizabethkingia Miricola in the patient and you get that identification from a reference lab?

A Yes.

Q But when the lab-- I'm assuming it's the GRI lab?

A Yes.

Q When it analyses the water, it can't-- The sample swabs from the beams or the water supply-- it can't identify miricola because it doesn't have the technology?

A It would have been unlikely to at the time and there was, obviously, quite a lot of learning from this incident. So, if we take it forward to 2021/2022, myself and the team at Glasgow infirmary and UKHSA water labs got some funding to develop water testing methodology for some of these gram negatives, and we put Elizabethkingia on that list, and we tested and developed a methodology for 10 Elizabethkingia Miricola isolates. So, this issue stuck with me, and we now have a methodology that could be used and would hopefully detect it, but at the time it is possible that it was what we might refer to as an unidentified gram negative.

Q So, how do you respond – I mean, it's not only just this one, but it applies to a number of other cases you've discussed – to the idea that, if there's not a link in terms of genetic link between the sample in the patient and the sample in the environment, one wanted to exclude an environmental source? Because that

seemed to be the position of the Health Board.

A Yes. That's what we were doing. We were screening for an environmental source.

Q But if you didn't find the link-- So, if you found a sample in the patient of this species and a sample in the-- I know you didn't on this occasion, but if you found a sample on the chilled beam or in the water supply-- If I understand the Health Board's position correctly, it is that, if you can't directly connect these two sources with the same very closely related bacteria, there isn't an environmental connection; it's an exclusion. Do you agree with that, or disagree with that?

A No. I don't agree with that. I mean, outbreak management is about-- and hypothesis generation is about plausibility. Is it plausible, first of all? It was plausible from the information that we had. We had a known water-borne organism, we had leaks from a chilled beam, and, you know, is it probable? Well, highly probable that that's the cause. We don't-- Outbreak management is very uncertain at times, and we don't always prove a link. It's a very-- Environmental sampling has many pitfalls. I've just described one of them. It is very difficult-- When you've got such a large surface area to cover with

swabbing, it is very difficult at times to actually-- Bacteria adhere to surfaces, and there can be problems actually getting them off the surface with the swab, so the yield is sometimes quoted as being as low as 25 per cent.

Q So, you're only getting a quarter of the----

A So, you're only getting a quarter, and then when you get to the lab to get the bacteria from the swab onto the agar plate, that's another 25 per cent. So, I don't think that you can rule out an environmental connection just because you've got negative environmental sampling results. It's a bit like searching for a needle in a haystack. If the results are positive, then that's great, that really supports your hypothesis, but I don't believe that you can exclude an environmental source, particularly when you have, you know, an epidemiological link in time, place and person, an excessive number of cases, and you've got a very plausible and likely source.

The name of that organism told us so much because it's Miricola. It comes from the space station Mir. It was identified in condensation, and you have condensation forming on a chilled beam. So, there is a high probability that that was the cause. We just weren't able to prove it due to pitfalls in environmental testing.

Q I'm going to do this out of order, but it seems a good place to do it. Could we go to page 218 of your statement, to paragraph 656? Now, you touch, at the bottom of this page, in the context of a different IMT later on, about how you select samples from biofilms. Now, I appreciate that Elizabethkingia wasn't involved in a biofilm. It's a different source.

A Yes.

Q It was the chilled beams, but since we're talking about this topic, let's explore it a bit further. If you were looking at a potential environmental source in a water supply, why do you say that biofilms are complex and have multiple strains of bacteria?

A So, biofilms in a water supply-- Hospital water, it's not sterile, so there are low levels of bacteria in hospital water supplies. If the system isn't adequately maintained/doesn't have appropriate control measures in place, then biofilm develops and that will continue to become more complex, and that was certainly the case in the Queen Elizabeth because we had problems that date right back to the installation. I think it was pre-filled a year before the hospital opened, so many, many years for this biofilm to accumulate, and over time it will become very complex with lots of different types of bacteria and lots of different strains of

bacteria caused----

Q When you say this biofilm, I'm assuming it's not one object, is it?

A No, no. It's a complex community of bacteria, and it's like a slime lining all the pipes, and it can be very difficult for disinfectants to penetrate the biofilm. That's-- One of the challenges when biofilm develops is that they can become resistant to disinfection.

Q In terms of quantity of biofilm-- I doubt anybody has ever scraped every piece of biofilm off an entire hospital water system and weighed it, but in terms of area or volume, what should we be conceptually thinking in order to understand the biofilm at Queen Elizabeth that's in existence in 2016?

A I think it would be very extensive. I think, in a well-maintained water system, you can have a localised issue to the outlets, and you can have relatively limited formation of and that might occur because of poor tap maintenance or a lack of flushing or practices-- you know, inappropriate practices around the sink.

In that situation, when it's limited to maybe one or two outlets and you've been doing regular water testing, the biofilm might not be so complex, and quite often in those outbreaks you are able to get a match between the patient and the strain in the water because the

biofilm hasn't had time to develop. But in the situation with the Queen Elizabeth, you've got many years for that biofilm to develop and extensive pipe work: so many outlets which weren't being maintained. So, that biofilm is likely to be very extensive and very complex with multiple different types of bacteria and multiple different strains of bacteria as well.

Q So, you provided the Inquiry with an article-- an editorial you wrote for the Journal of Hospital Infection in 2021, which is in bundle 19, page 1232, document 41. I'm not going to go through this, because like the Journal of Hospital Infection, it's very small text and there's an awful lot of words, but if we read this, to what extent does this sum up your understanding of this issue about biofilms and complexity and diversity?

A Yes, it does.

Q Right. Now, we'll read that, and I think Dr Mumford and Ms Dempster have read it, but the reason I wanted to put it up on the screen and talk to you about it is: what evidence do you have that the biofilm in this hospital was as complex as you say it is?

A The evidence from that comes from what we were growing in the water, in terms of the different organisms and the diversity of the different organisms----

Q We can take that off the screen, by the way.

A -- and also what we were growing in the patients and the diversity of those, and the fact that, when we were doing typing, we were detecting multiple different strains of bacteria, and if you were to read the literature on waterborne outbreaks, you will find that more complex contamination incidents – so not localised to the taps so much but further back in the system – are what we call polymicrobial, so that's multiple different types of bacteria, and polyclonal, multiple different strains. So, that is described in the literature.

There are outbreaks of Stenotrophomonas, for example, where people have found five different strains in patients, three different strains in water. They don't all match up, but what does happen is, when they put in the control measures, they bring the problem under control, and it goes back to what I'm saying about the challenges of environmental sampling and not taking enough colonies from the plate to do your typing.

Q One of the things that we've noticed in the work of Professor Leonard, who's coming to give evidence next week, is that, yes, he looks at the genetic connection between the samples in the patients and the samples in the environment, and we've just discussed

your views on what to do when there isn't one, as it were, or a close one.

What about when you have a group of patients who are closely located in space, in the same ward, some of them using the same shower or the same sink? They're in the same room sequentially, and they all have the same bacteria identified species-wise in their blood samples, but there's no close genetic connection between those individual samples? I think he would say that excludes a connection between the patients and, therefore, a connection with the environmental source. How would you respond to that?

A I think it depends on the input to the whole genome sequencing. So, I think, first of all, you would need to think about your sampling strategy at the time, and in the case of our incident, whilst we started sampling in Ward 2A and all the outlets there, we then had to divert resource to another part of the hospital, so we weren't focused exclusively on sampling Ward 2A over a prolonged period of time because----

Q Because the patients were decanted, so you had to----

A We had to-- Because of the risk in Ward 2A, we had to start testing elsewhere to find somewhere to move the patients to. That's when we found that the neighbouring ward had positive

results. That's when we suspected it was systemic, and that's when we had to go and test all the wards. So, we moved all the resource for the water testing of 2A, put on point of use filters, and tested all those other areas. So, the sampling strategy for 2A in comparison to if 2A had just been the only ward affected was much more limited, if you see what I mean.

Q Yes.

A And when it came to drains, which is particularly important for the enterobactors, the drain sampling was extremely limited because there was a risk to patients just from the process of sampling a drain. The drains were in such a dreadful state with biofilm and reflux that actually putting a swab down that drain is bringing it back up into the site, contaminating the surrounding environment, and put patients at risk.

So, my approach to that was I just need to know if you've got the same organisms in the drain as a patient to strengthen that hypothesis, and after that, I'm stopping, because it's actually not safe to keep doing that. So, the sampling strategies, for different reasons, were limited, so that input into that whole genome sequencing is far from optimal.

Q What would you have had to do, in terms of a sampling strategy, to produce enough material, genetic

material, to run this whole genome sequencing testing programme in such a way to enable you to exclude an environmental link?

A So there's two things that could have been done. So, Suzanne Lee talks about colony picks. So, say, for example, you have a patient with Pseudomonas in their sputum, they're coughing up sputum and you culture it in the lab, you look at the plates, there's all the colonies on the plates. If you are to pick off more than one colony, you will find different strains of Pseudomonas in patients like cystic fibrosis patients who have biofilm in their lung.

The approach to typing and whole genome sequencing is just to pick off a single colony rather than 20 or 30 colonies, which was the view of Suzanne Lee, and there's quite a nice study in an intensive care unit where the researchers, instead of taking a single colony of Pseudomonas from a respiratory sample, they take four, and they also sample the water at the same time, and by taking four colonies, they were more likely to get a match to the water samples. So, the first thing you can do is you can increase your colony picks. Am I explaining this----

Q No, no. I mean, might it be the case – and I don't know whether there's any research on this – that there's

actually a sweet spot where the number of colony picks you need to take generates an appreciable benefit in terms of likelihood to pick up a match?

A I think so, and in talking to Suzanne Lee, her view-- and I think she had some discussions with statisticians at the time. Her view was 20 to 30. The other thing that you could do – but we can't do it now because the system has been doled with chlorine dioxide – is if you wanted to, you could take sections of pipework. How much pipework you would need, I don't know, but you can do something-- a much more sophisticated thing called metagenomics, which looks at the community of bacteria as a whole.

It's even more sophisticated than whole genome sequencing, but the problem now is that there's been chlorine dioxide through the system, and that's going to have altered the biofilm, so there might not be any guarantee that you would pick up the same strains as the patient, so-- and it would be quite a significant undertaking to, you know, chop out bits of pipework.

Q Right. That's helpful. I've saved us some work for tomorrow afternoon, I think. Let's return to 2017. Am I right in understanding that it's in June 2017 that you go on sick leave because you have been diagnosed with lymphoma?

A That's correct.

Q And you don't return until January 2018?

A Yes.

Q Before we leave this period of time, I wanted just to ask you to, using what you know now, reflect back to the summer of 2017, and answer, giving your opinion if you have one, of whether there was a link then between patient infections and the water system in Ward 2A?

A I believe there was, yes. So, prior to me going off sick, we were starting to see an increase in environmental organisms. We'd started to look at this. We did have concerns at the time about cleaning on the ward, but we had started to investigate what we felt was an increase in environmental gram negatives, and we'd actually-- I think it was under the instruction of Dr Armstrong. We had arranged to set up a weekly meeting to discuss these infections, but unfortunately I went off sick, and I don't know what happened at the time to that meeting, but I do believe around that time, yes.

Q What was the-- what's the causal element within your hypothesis that there is a link? How is it-- the infection getting from the environment to the patients, and is there one reservoir or is there multiple reservoirs?

A So, there's multiple ways.

There's what we would call direct transmission to the patient, so, in the context of a haemato-oncology patient, that would be a patient showering in contaminated water with a Hickman line, which is a skin breach. That's the risk there. So, there's the direct, but there's also indirect, and that might involve contaminated hands of a healthcare worker washing their hands in the water, transferring that to the patient. It might be related to equipment that has been contaminated. So, around a sink there's what we would call a splash zone, and generally speaking, if you have anything stored within a splash zone of 2 meters then there's a risk that there will be splash onto that. So, equipment can become contaminated and it can transfer to the patient that way, so that would be an indirect route. So, those would be the routes. When we talk about drains, we then need to think about, you know droplets and aerosolisation, and that sort of thing as well, so multiple, yes.

Q We'll come back to drain aerosolisation in a moment, but just at that point in 2017 were drains part of your theory of the environmental link?

A No.

Q No. Do you think they were an issue then in '17?

A I don't believe so. I think with the drains, I think the problem would have

come to light eventually, but I think the problem came to light quickly because we applied point-of-use filters and----

Q Can we come back to that when we get to that?

A Yeah.

Q Otherwise, we're going to get very confused, very fast.

A Okay, sorry.

Q What I want to do is stay at 2017, so this artificial exercise of looking back from now to the summer of 2017. So, you've identified that you think there was a link, and you've given us some some possible routes. To what extent do you have a view about the sort of bacteria that were causing the infections? Were they all in one class, one species, or do they have a particular feature, the population that's causing the risk?

A So, at the time, obviously, the population was immunosuppressed patients in 2A.

Q No, I meant the population of bacteria.

A Oh, sorry, the bacteria. I'm trying to think. Back then, I remember that Stenotrophomonas featured back then, which is a waterborne organism.

Q But was it more than than one type of organism that you were thinking of?

A Yes, it was at that point, yes.

Q Right, okay. What we're going

to do now is look to your period after your return, if you don't mind. Now, we have, in your statement----

THE CHAIR: Mr Mackintosh, before we leave this, just really to check with you that you have taken this as far as-- or at least as I've understood, the distance you've taken this. Dr Inkster has said that it is her view that in the summer of 2017 the experience of infection in Ward 2A was linked to the environment.

MR MACKINTOSH: Yes.

THE CHAIR: Step one. Dr Inkster has identified possible routes.

MR MACKINTOSH: I think she identified three.

THE CHAIR: Sorry?

MR MACKINTOSH: She identified three, my Lord.

THE CHAIR: Well, I said possible routes, which I've noted as direct showering, indirect contamination directly by a healthcare worker and the, as it were, secondary contamination through contact with an item.

MR MACKINTOSH: Yes.

THE CHAIR: Right, but my point is that I've got the opinion; I've got the possible routes. Is that all you wish to take from the witness?

MR MACKINTOSH: Well, I think the only thing I wanted is to take the opportunity of clarifying-- is you've identified Stenotrophomonas as one

particular possible organism. I'm not going to ask you to name all the possible organisms because then that would be rather difficult, but what I'm trying to ask is, knowing what you know about was later found in the water and in the biofilm in '18 and '19, are we able to say anything about the nature of the population of the biofilm that was, in your eyes, causing the risk? Is it single species? Is it multiple species? Are you able to help us about your idea of what was going on then?

A Multiple species.

Q So, I think, my Lord, I'm happy with that at this stage. I'm proposing to move onto your return, and to deal with a matter of, sort of, the restructuring that was proposed upon your return.

A Yes.

Q Now, you've covered that in paragraphs 490 to 503 of your statement. I'm not going to go to that on the screen. What instead I'm going to do is go to Bundle 14, volume 2, document 85, page 10, which reads-- or what is this? This is an email that you sent on 24 January 2018, and a reply from Rachel Green, but let's look at your email. What's this email about and why are you sending it?

A I had come back to work in the first week of January and on the first day I was informed by the Head of Service that things had been awful while I was off sick. There'd been difficulties with my colleagues.

Q Who was the Head of Service?

A Professor Brian Jones.

Q Right.

A And that he was changing the structure, and that I would no longer report to Tom Walsh and Jennifer Armstrong, but I would report to him, and then Professor Leonard, and then Tom Walsh, and then Jennifer Armstrong. So, it was a change in the structure was proposed, and then he also said to me that I would need to give up my training programme director role, which was an additional role I had, because I had a conflict of interest. The reasons for him saying this, they weren't explained to me. I didn't get an explanation as to really why the structure had to change, other than colleagues had been difficult while I'd been away and there'd been lots of issues that had come to light.

Shortly after he had come into my office, there was a stream of colleagues that came to my office giving a slightly different picture, saying that there had been lots of issues, concerns about the built environment, that they were raising concerns and that the Infection Control senior management team were not listening to their views, and they'd also informed me that they'd had-- they'd gone to a Stage 1 whistle blow. So, it was

quite a confusing time for me because I had, sort of, two different stories, I guess, but I was very worried when I came back at the lack of progression of some of the issues that I had left.

There had been changes to the Infection Control team, so when I took over as lead, I thought it was very important to get everyone working together as a team, and also I thought that the personal development of my ICD colleagues was important. I wanted them to be more autonomous because that was something we hadn't had, and I started to allocate them to sit on various different groups so they could, you know, I suppose, gain expertise in a particular area. So, I had people for a water group, people for education, and people for policy, that sort of thing, and I was trying to get more ICD input into the Infection Control team and promote closer working.

When I came back that appeared to have all been stripped back, and I was really concerned because there were lots of built environment issues. We were repeatedly told that the nurses in GGC did not do water, they did not do ventilation, and when I came back it was evident that there was no medical leadership for those particular aspects, and I was concerned about that.

Q So, you effectively decided to resign at that point?

A I supported my colleagues, and from what I had seen and heard, my major concern at that point was that the culture had reverted back to the culture around the time that myself and Dr Peters were raising issues in 2015.

Q And on the next page do we see more reasons that you've raised in addition to the new structure and the team?

A Yes.

Q You've raised an HAI scribe issue. What's the Ward 4B/2A issue?

A Yeah, so, Professor Jones said to me that he was changing the reporting structure and that I was to have no more input into Wards 4B and 2A because he would be leading on those.

Q Right, and then the handover is that you hadn't received one from him.

A I didn't receive one.

Q And then, the TPD you've already mentioned.

A Yeah.

Q So, I take it that your resignation doesn't go ahead?

A It doesn't, no.

Q Why is that?

A I was asked to go and meet with Jennifer Armstrong who told me that she'd spoken to various people and, essentially, persuaded me to stay in the role, and the reporting structure was not

changed at that time.

Q Had the reporting structure changed, what impact would it have had on the ability of the Infection Control team to spot unusual micro-organisms?

A I mean, I think we're dependent on microbiologists because our surveillance systems are not adequate to spot these unusual organisms. I'm not convinced a change in structure would change the ability of a Microbiology colleague in identifying an unusual organism.

Q Well, I suppose one of the issues we've discussed with the witnesses is that when you gave evidence at the very beginning of your session about how the Glasgow team, to your eyes, was quite good at dealing with standardised reporting and things that were known and was less good at dealing with things that were unusual, and I'm wondering whether this change, in addition to having the changes that you've discussed in this letter, would have any impact on the ability of the team to react to the unusual and the unexpected.

A I don't believe changing the structure would help with that.

Q Or would the change of structure have harmed it in the way they proposed, by inserting layers between you and the medical director?

A Well, microbiologists would still be reporting unusual organisms, but I suppose when it came to me to do anything about it, I don't have access to either the Infection Control manager or the HAI executive lead without going through other people.

Q And that would have been two layers you would have had to go through.

A Two layers, and similarly if the HAI exec lead wanted to speak to me,it would be, you know, coming back down through those layers as well.

Q And the HAI executive lead is Dr Armstrong.

A Uh huh, so I always think that it's really important that-- I mean, essentially, I had a direct line to Jennifer Armstrong even though it wasn't down on paper. I could phone her at any time about any issue and I was really concerned about that, the ability to do that effectively being removed, particularly given all the issues that my colleagues had told me about when I came back.

Q And who do you think ultimately decided not to go ahead with this restructuring?

A It's not clear to me. Possibly Dr Armstrong, but that's not clear.

Q But it didn't happen in any event.

A It didn't happen.

Q All right. Now, whilst you were off on sick leave, we can take this off the screen, we've heard evidence about how three of your colleagues raised an SBAR on 3 October 2017, and ultimately met with senior people in the Health Board and an action plan was produced. I appreciate whilst you were on sick leave at the time, but just so we can clear it up, did you have any involvement in the creation of the SBAR, or the meeting, or the creation of the action plan?

A No, I did not.

Q Did you know about the creation of the SBAR before you returned?

A Yes, I did.

Q And how had you heard about that?

A Colleagues were coming to see me when I was off sick.

Q And telling you things.

A Telling me things, but I was better at that point and, you know, I kind of wanted to know what was happening at work, I guess, so I don't think we can be critical of them for doing that. It was-- yeah, inevitable that there would be something said about work.

Q What I'd like to do is to look at an email sent on 12 March, from you to Professor Jones and Mr Best on-- that's the Bundle 14, volume 2 document 89, at page 100. Now, what this appears to be-- Well, what's going on here because it looks like you're attaching something to-- you see how it's called, "Response to microbiologists."

A Yes.

Q Are these the three microbiologists who raised the SBAR?

A Yes.

Right. So, what is it that was attached to this email?

A So, when I came back I got sent a copy of the SBAR and I wasn't happy with the content.

Q Of the SBAR?

A Yes, so I made some amendments to the SBAR and I was also concerned because this document was being tabled at the Acute Infection Control Committee.

Q And was this the action plan?

A Yes.

Q Right.

A And there were-- and my colleagues hadn't received it.

Q So, let's look at the action plan and the papers that the committee. I think it's bundle 20 document 48, page 794. So, if we were to look at the previous two pages, so 792, we see this is a paper for the Clinical Care and Governance Committee.

A Yes.

Q Now, this has happened well after the events we're discussing.

A Yes.

Q But the action plan that we see attached at 794, is this anything you've had input into?

A Not this version, no.

Q So, what version did you have an input into?

A Well, I got this version, but I changed it and I sent them----

Q And that's the email, Dr Armstrong, we've just looked at?

A Yes.

Q So, in March you received this version?

A Yes.

Q And you commented on it?

A Yes.

Q Did they take on board your suggestions?

A So, at the time, they appeared to, and I think it went to another committee. I think my version went to the AICC, but later – I think into 2018/2019 – they reverted back to the previous version when issuing the update, and I expressed concern that we weren't using my updated version, and I was told for governance reasons, I believe, that they had to stick to the original one even though it wasn't accurate.

Q Yes, because one of the things I don't really understand about this action plan is it's an action plan to do things that the people who've inspired it think is

about Infection Prevention and Control.

A Yes.

Q Who's in charge of implementing this action plan?

A That was never made clear to me. My feeling was it was Dr Armstrong, because it was a step 1 whistleblow, and she chaired that and instructed that action plan.

Q Why wouldn't it be you as lead ICD?

A I didn't have any role or responsibility, I guess, in a whistleblowing process, and many of these actions are not just for me as an ICD, many of these actions involve Estates and other departments. So, I don't have any sort of control or remit over allocation of resource or-- you know, to Estates. I've got no managerial responsibility or anything like that to the other people that might need to be involved with this. So, I think it should have been----

Q So, from your point of view, the ownership of this, in terms of implementing it, should sit with the person who chaired the whistleblowing meeting?

A Someone very high up in the organisation, yes.

Q And although you have direct access to Dr Armstrong at this point, you're not very high up in the organisation with it-- would you----

A No, not at the level of a lead ICD, no.

Q No? Right. What, in your eyes, was missing from the action plan? If you want to look at your statement, page 157 has some of the items.

A Yes, so, I was particularly concerned about Aspergillus. It wasn't open and transparent in relation to those two IMTs in 2016 and 2017 that I chaired. I think there was reference to rates being comparable with Yorkhill, but we had in fact found significant issues with the environment. We were concerned about the rooms, the chilled beams, the water leaks, so I felt that was not an open and transparent update on Aspergillus. It felt to me that information wasn't being shared with these ICDs.

There was a suggestion that they were unaware of, you know, plans for all the upgrades to the negative pressure rooms and the BMTs, and that information was available and it was available from people around the table. It wasn't just information that I held. So, I think the comment was, "Lead ICD is dealing with this", which I found to be insufficient because they could have given them much more information and perhaps more reassurance at the time that things were being done, albeit slowly.

Q Because the thing that I'm finding a little strange about this is this action plan seems a very important document from an outsider's point of view. If we go back to it in bundle 20, it lists a series of issues, a current position, and actions. Now, one might argue about whether the "Current position" column is accurate, and one might argue whether the future actions ever happened, but it is an action plan.

A Yes.

Q And the odd thing about it is the list of items is a subset of what's in the SBAR.

A Yes.

Q Why isn't the list of items a list of items that Dr Armstrong or anybody else who was at the meeting in terms of management, thinks need doing? Why are they only acting on the things in the SBAR? Because you have-- At this point, which is early '18, we've had a whistleblower. You've had a number of problems with Ward 4B and its upgrades. If you're going to nod, you're going to have to say yes.

A Sorry, yes.

Q You've had a number of problems with Ward 2A. Yes?

A Yes.

Q You haven't yet got into the Ward 5C/5D thing?

A Yes.

Q And you've learnt about the-- You're about to learn about the general

ventilation?

A Yes.

Q Is it fair to say this action plan is a reaction to what's in the SBAR? It's not a list of actions designed to solve all the outstanding problems of the hospital.

A Yes, I would agree with that.

Q Are you aware of whether there was a single list at this point of actions to solve all the outstanding problems with the hospital?

A No, I'm not.

Q Would you expect to have been told about them if they had Infection Prevention and Control relevance?

A I would have, yes.

Q So anyway, you make comments. They don't get incorporated-- They get incorporated to AICC, but not at this higher level board?

A Yes.

Q Right, okay. To what extent were you involved at any level with providing information to Dr Armstrong on the implementation of these items?

A There were regular updates at meetings. So, AICC-- but she wasn't at that, but she would get the minutes, but also board Infection Control Committee, there were updates on that as well----

Q On the action plan?

A On aspects of the action plan. I don't think there was ever a day where we went through the entire action plan, but aspects of it were updated.

Q And was there ever at any point items that the three microbiologists didn't know about that you were concerned about added to the action plan?

A No.

Q Now, I'd like to look at a document you might not have seen at the time, but you're mentioned in it, if only in passing, which is the Stage 2 Whistleblower Report provided for Dr Redding and her colleagues-- or Dr Redding particularly.

A Yes.

Q Bundle 27, volume 4, document 6, and that's page 81. Now, if we can do the whole page, it might be easier. Thank you. So, this is a report which Dr Redding did not see at the time, but it's Dr De Caestecker's report, I'm assuming going upwards within the organisation. Do you see how-- I mean, you got the stage 3 report later on, I understand.

A Yes, I did.

Q Why would you have got that?

A I don't know. I queried at the time why that was sent to me. I was not part of the whistleblowing process. I was not interviewed by the individuals conducting the process. I don't know why I received it.

Q Are you a whistleblower?

A I whistleblew, but externally to the organisation.

Q Yes, exactly. So, if we go on to page 82, we see a list of the people Dr De Caestecker has interviewed, and we see that you're mentioned along with the other members of the Infection Prevention and Control team. The senior trio. There's Mr Walsh and Sandra Devine, and Dr Jones is your head of service, and Dr Kennedy-- Do you know why he's been interviewed?

A No, I don't.

Q No, and Dr Rachel Green, what involvement would she have with the three whistleblowers? Would she be their head of department, effectively?

A She was the chief of medicine for diagnostics, so she would sit above the clinical director level. So, sort of three up from consultant microbiologists.

Q Now, if we look on the next page, top page 83, we have a paragraph. Now, these of course are Dr De Caestecker's words and I will ask her about them next week, but when she says "I discussed with the lead Infection Control doctor [we can probably zoom in at the top half of the page] the 3 versus 6 air changes issue," I'm assuming she'd be talking about you at this time.

A Yes.

Q So, did she discuss with you the 3 versus 6 air changes issue?

A I believe she did, yes.

Q Some people say they believe they did, but they don't remember. Do you remember her discussing with you?

A I remember talking about all the ventilation issues at the time in the various SBARs that I'd written and I gave her an update on them, so I'm fairly confident, but I can't say for sure.

Q Right. "The Scottish hospital building note recommends 6 air changes per hour." Do you think that's a reference to SHTM 03-01.

A It is, yes.

Q Right. Now, the next sentence is interesting. If we look at it in two parts. We'll pass over the first four words, "However, the Infection Control team", we will come back to that, and then:

> "... consider that the additional risk to patients in standard accommodation is negligible as 3 air changes brings down contamination to 5 per cent and it is single accommodation."

Is that something that you would have said, Dr Inkster?

A Highly unlikely to be language that I would use. I would have referred to the CDC, the Centre for Disease Control table on dilution of airborne contaminants. I wouldn't use that sort of language.

Q I mean, it's a hard question to ask in the middle of (inaudible) evidence, but does the CDC table say 5 per cent, or would it explain it a different way?

A It says that 6 air changes per hour, in terms of the time that you need to leave after an AGP, would be anywhere between around 45 and 60 something minutes.

Q Sorry, an AGP?

A Aerosol generating procedure, for 6. So then, if you drop that to 3, then you effectively double that time. So, that's where I got the 2 hours from. So, if you had 6 air changes, you would wait approximately an hour. If you had 3 air changes, you would wait 2 hours.

Q So, you would measure this in time, not in percentages?

A Mm-hmm. At the same time as this document was produced, there was a board Infection Control committee meeting where I was asked to explain this to Dr Armstrong, and I quote the Centre for Disease Control Guidance at that meeting, and I was then tasked by Dr Armstrong to look at it again with Dr Kennedy's input. It seemed quite straightforward to me, because I had the CDC guidance, but nevertheless we did look at it again and we reported back at the next meeting. So, it felt to me that perhaps my view was being challenged on this air change issue.

Q And then if we look at the next sentence:

> "There has been no transmission of the higher risk pathogens and there are now alternative pathways in place for the very high risk ones such as MERS and MDRTB."

And then the final sentence-- final two sentences, are those bits a reference to your SBAR and the SOP changes involved?

A Yes.

Q And are they broadly accurate?

A Well, they're not the full range of recommendations, they're----

Q But within each one?

A Mm-hmm.

Q And what I want to just ask is: ignoring again who is saying this, is the second half of this-- is this paragraph broadly accurate?

A The first paragraph?

Q The whole of this first paragraph. Is it broadly accurate?

A Well, in terms of transmission of higher risk pathogens, it would be too early to determine whether there had been an outbreak of tuberculosis, for example, simply because, in many individuals, the organism becomes latent and it-- whilst they'll inhale it, it will sit in

the lungs for a period of time, and it will reactivate in the future.

It might only be at the point where you get the reactivation that you send the sample to the reference lab, and they type it, and they match it to, you know, another patient who'd been in that same ward, or a staff member who'd worked on that ward. So, it would be too early, in my view, to say "There's been no transmission of higher risk pathogens", particularly with respect to TB.

Q Since the hospital opened?

A Yes. You know, we couldn't conclude that at that stage.

Q So, would you say that?

A Unlikely to have said that.

Q So, we go back now, as I said we would, to the third sentence, "However, the Infection Control team considers..." I'll obviously ask Dr De Caestecker why she didn't say "The lead Infection Control doctor" at this point, but do you take anything from the change of phraseology to mean that the actual source of this is somebody else?

A Yes, because she talks about the lead Infection Control doctor at the beginning, so I guess why not just continue on that theme? Why change to say Infection Control team? That seems odd.

Q So, who else in the Infection Control team could explain this to her?

A Sorry, could we just go back to the list of attendees?

Q Yes, of course. Previous page, please.

A So, Sandra Devine in her role as associate nurse director for Infection Control, I think, would be the only one. Brian Jones may have been asked to review as a microbiologist.

Q So, they're the possible two sources of that information?

A Yes.

Q Thank you. Now, if you go back on page 83, this paragraph, this appears-- this has been done about a year after Mr Powrie's email to you.

A Yes.

Q Am I right-- Would you agree with me that there's no evidence in this document that Dr De Caestecker has been briefed about the justification for the ventilation derogation?

A Agree.

Q Now, I need to go to the bottom of this page where there's a list of criticisms of Dr Peters, and how would you respond to these criticisms of Dr Peters as someone who works with her?

A I wouldn't agree that she finds it difficult to accept balance of risk. For the reasons I explained earlier, in terms of undertaking risk assessments, you need to be fully informed, and there were many situations where we didn't have that

information.

Q Is there anything in there which you find has any sort of basis in your experience?

A No.

Q One of the issues-- The last thing is a discussion of sending emails.

A Yes.

Q Did any issue arise with Dr Peters and the way she sent emails that you might have addressed with her?

A It did, yes.

Q If we take it off the screen, you can tell us what that was.

A So when I came back in 2018, initially I was on a phased return. So I was only----

Q 20----?

A In 2018.

Q '18, yes.

A Phased return, so only in part of the week, which meant that I was not attending many of the morning handover meetings or departmental meetings where I would normally be communicating issues.

I was dealing with the water IMT, and I would come back to my office quite late with a long list of tasks and communication to Microbiology was quite far down the list because I had lots of other people to communicate with, including government and various other individuals, and I was often sending

updates late in the evening and microbiologists were getting phone calls at home and I hadn't sent them an update. So there was definitely an issue with my communication. I accept that it wasn't timely to them at the time.

So, in addition, when I did send updates, I would get a lot of feedback from Dr Peters in sort of red writing for each point asking for more information and, at the time, that was adding to my workload, but we spoke about it. We met and spoke about it, and I accept that my communication to microbiologists was suboptimal. It was exacerbated by me having communicated to an individual ahead of a weekend. They said I hadn't, but actually I had, so that had sort of fueled things a bit more, and I think also what came out of that conversation was a lack of trust.

So, I think colleagues found it hard to understand the fact that I came back to work. I supported them. I attempted to resign, and then I went back to work with essentially individuals that they'd raised concerns with. So, we had a long conversation about all of that and we cleared the air and moved on.

Q And did Dr Peters' email style change?

A It did.

Q Now, I'd like to pick up an issue that relates to the provision of water

testing results to microbiologists, which I think comes up in a water safety group meeting on 16 October 2017. So, that's bundle 11, document 25, page 77, and I think it's actually on page-- Well, it could be done in different places. So, your statement suggests this is the place to go, and I'm a little bit thrown by what I find, and I wonder if you can help me out. So, firstly, let's check you were present at-- You're recorded as apologising at this meeting for not being there. That's the first thing that threw me slightly.

A I wasn't there, yes.

Q Yes, and then we have on page 77, item 5, over the page, there's a discussion-- Sorry, I'm just going to make sure I've got the right place. Yes, do you see how it begins, "IP noted of the issue with Infection Control doctors regarding sampling for Legionella"?

A Yes.

Q Now, there's that entry, and then there's another entry on page 79, which is Ward 7B, “IP noted the issue within Ward 7B within the showers and Infection Control colleagues looking to obtain historic records." Are these the things you're pointing to?

A Yes.

Q Right. Let's go back to the first one on page 78. How was it that Infection Control doctors were trying to obtain sampling for Legionella and how

does this relate to the conversation we had before lunch about meetings with Mr Powrie around water testing results in 2016?

A I understand that, when I was off in 2017, that Infection Control doctors had difficulty obtaining results that they were asking for.

Q Now, were these Infection Control doctors who had a couple of Infection Control sessions in the Microbiology----

A Yes.

Q But it's not microbiologists with no Infection Control role at all?

A I don't believe so, no.

Q No, okay, and what do you understand from the various documents that you saw when you came back was the consequences of them asking for this material? Did they get it?

A I don't believe so, no.

Q Why do you think they didn't get it?

A I don't know.

Q I mean, does this minute help us understand why they didn't get it?

A No, I think-- Well, I think part of the problem, which I alluded to earlier, was that when I was off sick, the service was stripped back and there was no Infection Control doctor input at either this board water safety group or also the local sector group. Had there been, there

might have been that exchange of information.

Q So, we go back to page 77 and look at the membership of the group. Now, firstly, previously there's been you recorded attending as some of these.

A Yes.

Q And indeed Professor Williams has attended meetings.

A Yes.

Q And your recorded as giving your apologies at this point. At this point, you're off sick.

A Yes.

Q So it must be a standing apology.

A Yes.

Q And no one's asked to replace you?

A No.

Q No. Wasn't Mr Wolf(?) sent down as the co-chair of this committee?

A Yes, I believe so.

Q Did he attend?

A Not frequently, no.

Q Did he ever give you an explanation of why he didn't attend the water safety groups that he was co-chair of?

A No, I think he delegated a lot of responsibility for that onto Pamela Joannidis in particular.

Q Well, we've heard from her about delegation----

A Yes.

Q -- so I'll probably leave it at that. Right, what I want to do is to take that off the screen and move on to the start of the water incident. Now, if we look at the-- I'm not going to go to paragraph 559 of your statement where you describe this. I'm going to look at some IMT bundles instead and try and do it that way. Bundle 14, volume-- Sorry, emails first. Bundle 14, volume 2, document 88, page 75. Is this, in effect-- This email from you on 1 March when the Beast from the East had been around, is this effectively the first IMT minutes of the water incident?

A Effectively, yes. I had to do things by phone.

Q Right. Now, what's the connection in your mind between the water incident and the previous 2016 aseptic pharmacy Cupriavidus cases?

A So, at this point I'm suspecting a link initially either through the aseptic pharmacy being the source because patients in Ward 2A would receive products from that unit, chemotherapy, nutrition, that kind of thing, but I'm also concerned that we have this organism in a high-risk unit and the potential for patient infections as a result.

Q But you're not currently looking at anything more than a point source of infection, in a sense?

A Not at this point, no.

Q No. If we go onto the teleconference on 17 March, so that's bundle 14, volume 2, page 107. So, this isn't an IMT. What's this meeting?

A This was a teleconference that was set up. I think it was Dr Armstrong that requested it because she wanted early expert input into what was quite an unusual situation at the time with this unusual organism, Cupriavadis, and we were particularly keen to get input from Health Protection Scotland colleagues, Health Facilities Scotland, but also Public Health England.

Q And how is this teleconference related to the IMT, the team itself, not the meetings?

A It was separate from the IMT. I think this was on a weekend.

Q So is this more of a briefing or something, or is it decisions being made?

A I think it was really an opportunity to seek expertise independently from the IMT process. I think, you know, people took the situation very seriously, and there was definitely an appetite to have a lot of experts around the table early on and discuss what might be happening here.

Q And at this point was there already a decision to install point of use filters?

A I would need to check the minutes. They weren't placed immediately.

Q So, I'm just going to find the page reference for you. So, if go on to the next page, a the bottom, do we see the short-term control measures, “continue as planned with the installation of point of use filters"?

A Yes.

Q Right. Now, the reason I went to that is because of the next entry. So, this is 17 March, "consider tap cleaning." Now, at this point, is anyone referencing back to the decisions made back in 2014 about the Horne Optitherm taps and the cleaning of them?

A I believe I was starting to ask questions about the decisions at that time, and that's when Sandra Devine sent me the minutes, but I don't recall any other conversations.

Q But the Estates people who were at that meeting aren't coming to you and saying, "You know what? We should probably have a plan"?

A No, no.

Q No. At this point-- Well, you explain in your statement at paragraph 556, though at this point you're also coming-- you then start to come across Stenotrophomonas Maltophilia and Pseudomonas Fluorescense if I've said that correctly, which I probably haven't.

A Yes.

Q So, why is that making you think-- Is that different from back in 2016? Is that an unusual development to receive those bacteria?

A At the same time as having an organism like Cupriavadus, that was strengthening the hypothesis that it was the water system. There may be different sources of Stenotrophomonas. It's not always hospital water; it might be contaminated solution or a piece of equipment. You know, there might be other reasons for the Stenotrophomonas, but when you see it with the Cuprivadis, that to me would strengthen the hypothesis that the water was the source.

Q And at this point in March 2018 are you getting the water testing results now?

A I was, yes.

Q Now, again, slightly jumping forward, in April you set up the water technical group.

A Yes.

Q Now, have I got it right that the water technical group is set up at a point when the water incidences have reached a, sort of, partial conclusion in some sense?

A There were some meetings before – I would need to check the dates – that had a different name called a water review group.

Q Right.

A So there were some people meeting I think before the official water technical group, but I would need to check those dates, but essentially, yes.

Q And these two groups, what relationship do they have to the IMT?

A So, there were some of us who were represented on both. So I attended the water technical group, as did Annette Rankin and Ian Kennedy.

Q But you didn't chair the water technical group?

A No.

Q And who was the point of contact-- reporting contact between the water technical group and the IMT?

A It would generally be me, but if I wasn't at an IMT, one of the others might do that.

Q Because Dr Deighan, in his later review of these issues in 2021, takes the view that that was a somewhat of a flaw of governance and you should have had a separate person reporting into the IMT. Do you have any comment on that?

A I suppose, ideally, the chair of the water technical group might have been the person to then come and report into the IMT.

Q That was Mary Anne Kane?

A Mary Anne Kane, yes.

Q She didn't attend the IMT?

A Not frequently----

Q I'm assuming she's relatively busy because what role does she hold at that point?

A At that point she was the interim director of Facilities, yes.

Q What I want to do is look at a water technical group minute on 13 April 2018, which is bundle 10, page 9. Now, you're not actually present, but an awful lot of people are, including Mr Gallagher, Dr Kennedy, Mr Purdon, Mr Powrie, and if we go on to page 10, we see at the bottom there:

> "It was noted that every floor had positive and negative readings whereby this would indicate widespread water infection."

Then, at the foot of the page, there is talk of decontaminating the system, and there's a reference to widespread contamination of the buildings in the next minute on 20 April, which is page 14, and you're present this time by telephone. Now, what I want to just make sure is: at this point in April 2018, is there anybody disagreeing with the idea that there's widespread contamination of the water system?

A No.

Q When you report it to that higher level briefing or to Dr Armstrong, is anyone saying, "No, you're wrong. The water is not contaminated"?

A No, no.

Q Would there have been any evidential reason to think the water was not contaminated?

A No, definitely not.

Q Why did you think the water was contaminated?

A At the time, we were working on various hypotheses, and the nature of the bacteria to me were those found in water and soil, and I thought there had been some sort of ingress at some point in the system. At the time, I was thinking about uncapped pipes.

Q During the building process?

A Yes.

Q That was your main theory?

A At that time, yes.

Q Now, how would you characterise the way your actions were being received by the medical director, the directors of Estates, senior people in the Health Board at this point?

A I would say, throughout this incident, people were very supportive. People went above and beyond to implement these measures. There was no one disagreeing at any point in time that we had an issue widespread contamination. There was a lot of good teamworking. There were some issues with the IMT around communication and operational issues, but overall it was very supportive at the time, and no challenge.

Q Was there eventually a debrief meeting for the IMT?

A For the first part of the IMT, yes.

Q That would have been on 15 May.

A Yes.

Q Who chaired it?

A Laura Imrie chaired it.

Q Now I'm not going to take you to the minute because we won't get through everything we need to get through, but I'm going to take you to a document we think might be connected to it, and I want to see if you can recognise it, which is-- It's in two places, but the way-- the place we've been going to is bundle 27, volume 5, document 19, page 46. It's also in, just for completeness, bundle 8, document 6, page 53, but do you recognise this document?

A I do, yes.

Q Who created it?

A I did.

Q Right, and just at the bottom of the page, we see it describes a type of incident:

> "Causative organism:
> Environmental gram negatives and fungi from biofilm.
> Main presenting illness:
> Bacteraemia, "

Then, it says "Food," which

surprises everyone when I've shown it to them. If you go over the page, what should we take the highlighting to mean?

A That is the source. This is a template-- a standard template that's----

Q Where do you get the template from?

A The National Infection Control Manual at the time.

Q Right. So, when you completed this document, to whom did you send it?

A I sent it to all members that had attended the IMT and the debrief.

Q And did anyone come back to you and say, "No, no, no, you've got it wrong"?

A Nobody, no.

Q Now, is this around about the right time for you to have created the list of organisms that should be tested for with Mr Powrie?

A Yes.

Q You think that's around about now?

A The water technical group had definitely been established, so around about that time, yes.

Q Now, we don't have a copy of the first version you created, but in order to connect it to the story, I want to show you what might be the current version, which is bundle 27, volume 1, document 19, page 278, which is the-- sorry, 276,

yes, which is the Water Safety Plan version J, but we understand there's another one about to be created. If we go to page 394, we have the procedures in event of out of specification samples.

Whilst this isn't your document because it's many years later, if we go on to the next page, and the next page, and a list of permissible results, and the next page, again, the sampling frequency, and the next page, more sampling frequency, the next page, again, more sampling frequency, and page 400, more sampling. Is this the sort of thing you were creating back in 2018?

A It's much more comprehensive than what we were creating. What we were creating at the was with a view to when it would be safe to use to remove point of use filters. So, the first part where you've listed the organisms and the parameters would have been----

Q That's page 394.

A -- based on myself and Ian Powrie's work, but the second bit with all the different wards and frequency of testing is not mine.

Q So, someone's made a more comprehensive version?

A Mm-hmm, yeah.

Q Now, I get the impression from reading the material of Dr Deighan and his review that you had an issue at this point about executive control of the

response to the water incident?

A Yes.

Q I'm not sure I fully understand it from his review. Can you explain what your concern was?

A So, around, I think, May time, I was concerned because we had the IMT, we also had the Water Technical Group, and then we had a group that-- I didn't really have any link to the operational group, and I felt, because of the complexity of it all, that-- Normally an IMT is an independent committee, but due to the complexity, I felt that there needed to be director-level oversight because, as I said before, I can't direct resource as an IMT chair and get things to happen, and I was concerned that things were slowing down. My view at that time was: we knew what to do, we'd had lots of discussion about chlorine dioxide installation, but people wanted to wait for reports, and I just felt things were being slowed down, and I----

Q When you say people, who do you mean by people?

A Senior people in the board, medical directors, director of facilities.

Q So, effectively, they wanted to get reports to check that your proposal is roughly right?

A Yes, but, from my perspective, I felt that the problem was very obvious: we had widespread contamination and

that we would need to employ a biocide. I'm not an expert in choice or delivery of biocide, but I felt at a very early stage we could have made contact with experts to start to get that moving rather than wait for reports. So, that was one of my concerns.

I was also concerned at the time, having these three different groups, the IMT, the communications to senior members of staff were coming from all sorts of different angles. So, people would come to IMTs with laptops and they would sit and type and press send before the end of the IMT, before myself or Sandra Devine got a chance to brief the medical director or the HAI exec lead, so----

Q Who do you think is taking notes then?

A There were individuals in the IMT taking notes and sending them up to their directors.

Q But you said you wanted director-level supervision. I don't understand why that's a problem.

A Yes. I wanted, sort of, more control over the communications, a proper communications channel.

Q So, you wanted to report to a director-level group, (inaudible)?

A Yes. I wanted director-level oversight with them reporting further up. So, the intention was that the director of

Women's and Children's would chair the Executive Control group, and that would then report up to the chief operating officer and the HAI exec lead, and it would all just be pulled together into a governance structure.

Q And that would have got rid of the operational group, whatever that did?

A It wouldn't have got rid of it. It would have still existed, but we would have had visibility of it and also oversight of it.

Q But, in a sense, there was oversight of you, because the medical director and all the other senior managers were making decisions in reaction to what you were doing. Surely that's effectively the same?

A They weren't always coming to the IMT though, or they were coming via different routes.

Q Such as?

A So, they would come via general manager of Women's and Children's, or the director, and they might give me feedback from a meeting that had taken place and a decision about the IMT or something for the IMT to consider.

Q Am I right in thinking that the position is effectively you wanted to be managed by a group, but in a predictable way?

A Yes.

Q Right. Now, what I want to do

now is to turn to the state of the drains in Ward 2A. So, again, staying with our time, we're in May, so we haven't got to decant yet. Can we go to-- Well, we don't need to go to them necessarily. There was a series of Stenotrophomonas and Enterobacter PAGs in May 2018. Do you remember those?

A I do.

Q And in them there's a discussion of the drains. What was the concern that you had about the drains at this point?

A At the time of these incidents, nursing staff were reporting to us that-- they were describing it as "black muck" refluxing from the drains back into the sink.

Q Is this related to the point I stopped you earlier on about-- in relation to the installation the point of use of filters?

A It is, yes.

Q So, how can you explain the connection between these two things?

A So, the drains were always going to be a problem because of what we subsequently found in relation to the structure, but by attaching a point of use filter we were reducing the distance between the tap and the drain, and by doing so, we were encouraging more splashing, and when you have splashing, you're more likely to dislodge the biofilm

and bring it back up into the sink. So I think the problem was always there, it would always be discovered, but it was, I suppose, brought forward by the application of point of use filters.

Q Would a point of use filter also affect the volume and speed of water leaving the tap?

A It could do, yes.

Q How would that affect the biofilm in this drain?

A Well, anything, in terms of volume or speed, that generates more splashing will dislodge the biofilm.

Q Before the point of use filters were fitted, would the speed and volume of water coming out of the tap help to clear the biofilm?

A In the situation----

Q Or am I not understanding it?

A In the situation-- Well, ordinarily yes, but the situation that we had, we had structural abnormalities in the drains. They were not normal drains, if you like. There was not free flowing of material.

Q Is this because the drains went horizontally backward from the sink?

A No, that's actually a recommended design. It was because, when we looked at the back of the sink and where it joins the pipe work, there was a lip which was promoting pooling and stagnation of water, and when you

get pooling and stagnation, you will get bacteria and biofilm forming.

Further back in the drain, however, there was corrosion of an aluminium spigot, and around that-- at the time I was told it was sealant and it looked like sealant. It was white material that was causing an obstruction in the drain, and when you've got obstruction and stagnation, well, that's the perfect conditions for biofilm, on top of practice that was going on in the sink, decanting, disposing of fluids/other products down, providing nutrition. So, you had the perfect storm in that drainage system.

Q Right. So, why this is before the chlorine dioxide system is fitted.

A Yes.

Q And I get the impression that drains remains a theme after it's fitted?

A Yes.

Q Why did the chlorine dioxide system that is to come not ultimately address the problem of the biofilm on the drains?

A It wasn't established at the time, the chlorine dioxide. It took a long time to install, and once you install chlorine dioxide, it doesn't work immediately, it needs to actually build up in the system, and you need to get to the point from the central dosing to the outlet. You need to reach an adequate concentration at the outlet, and that can

take an awful long time to achieve.

Q How long are we talking? Weeks? Months?

A Oh, no. I mean, it could be even up to a year, because it's got very extensive – well, in my view – biofilm to penetrate through before it gets to the outlet, so it can take a long time for those concentrations at the outlet to be adequate.

Q So, am I right in thinking that, eventually, the the amount of chlorine dioxide would be strong enough to clear the biofilm?

A Yes-- Well, it's not going----

Q Or is that too simplistic?

A -- to clear the biofilm, because it's such a complex community of bacteria and they're well protected in what we call a matrix. It's very difficult for chlorine dioxide to penetrate the biofilm. It might slough off the upper layers, but it's never, in my view, going to completely clear that biofilm that was well established.

Q We're going to come back to biofilm and the drains, I suspect, again. At this point, did you have any awareness, this-- Summer of 2018, what was your awareness of the diversity of the microorganisms involved?

A There was diversity. We were seeing bacteria that I had never seen before and was having to look up.

Q In terms of numbers of

different genuses being represented, are we talking fingers on one hand or more than that?

A More than that.

Q Right. Now, I'd like to look at something in your statement on page 182. This relates-- This is-- I can't pronounce this bacteria. Could you help me, please?

A Acinetobacter baumannii.

Q So, this Acinetobacter incident, you've discussed it here in your statement, and you've referred to it as "highly linked to ventilation".

A Yes.

Q So, I suppose what I'm trying to do is to do a bit like we did for the Elizabethkingia, trying to work out what you think of the hypothesis of the different routes, and so what are you thinking is the mechanism by which these-- this bacteria has been linked to the ventilation?

A So, Acinetobacter, whilst it's waterborne, it's a bit different from the other organisms we've spoken about, because it also likes very dry and dusty conditions, and it will survive well in them, and it is the airborne dispersal of Acinetobacter as described. Once it gets into an intensive care setting where you've got very sick patients, lots of devices, lots of equipment, it's very difficult to get rid of it. It's very hardy in the environment, very challenging, so when you see a Acinetobacter, the things that you're thinking of usually could be water, but also cleaning issues and dust, and then ventilation.

That came a bit later for me. We'd sort of worked through the process of investigating this, trying to find out where it was coming from. There were issues with the sinks in this unit. They had trough sinks, and these are the sinks that you would undertake a scrub-- a surgical scrub. They have them in the corridor next to equipment, so they might be splashing, so we were concerned-- there were a few things we were concerned about. The cleaning as well. We'd been raising issues about cleaning and high-level dust. So, initially there were other reasons for it, but later into 2019 I became aware of the verification report for the Paediatric ICU, and the ventilation was sub-optimal, and at that point, I wondered whether the Acinetobacter issue was in fact related to ventilation.

Q So, when you say the ventilation was sub-optimal, in what way would it have been sub -optimal?

A The pressure, so the specification for a general ITU is similar, in a sense, to the neutropenic ward with the absence of HEPA filtration. So, it's 10 air changes per hour and 10 pascals of positive pressure. The ITU hadn't been

designed that way. They didn't have sufficient isolation rooms, so I can't remember the exact details, but the air changes and pressures were not adequate.

Q So, why would you see the lack-- would the air changes not have just been three like the rest of the hospital?

A No, not in a Critical Care Unit. They're closer to 10.

Q Do you have any reason to think they weren't three?

A No.

Q But if the air change rate or the pressure differential is less than the guidance, how's that affecting the possibility that the Acinetobacter are, well, persisting in the environment? Is that how it's happening, or----

A Because for Acinetobacter, it's known that you can get airborne dispersal of Acinetobacter, so when that happens, having adequate ventilation parameters would be mitigation against that.

Q So, is that by dilution, by air change?

A Yes.

Q What role would pressure differential play in mitigation?

A So, pressure differential is about-- If your pressure is high, your positive pressure is high, then that's stopping anything getting in, but----

Q So, basically you'd be able to keep it out of rooms, essentially.

A Yeah.

Q Right. So, in terms of the individual rooms that the patients are in, a positive pressure in the rooms would help.

A Yes.

Q But in terms of a more open plan unit-- This is an open plan unit to some extent, isn't it?

A No, there was a mixture of isolation rooms, so there was a mixture of PPVL rooms, later a negative pressure room, and there was a mixture of what we would call a bay with maybe six to-- maybe six to eight cots, or four to six cots.

Q But in the bay positive pressure wouldn't help. It would have to be the air change that does the work.

A Yes.

Q So, what I'm trying to get to is are you saying that the air change rate is relevant to this ventilation linkage that you see here?

A Yes.

Q And that's something you wouldn't have thought of in 2018, it's something you've come across later?

A It's something I came across later, yeah.

Q Now, there was an earlier cluster, I called it a cluster, you may not call it a cluster. That's me just because

events happen at the same time, I'm sure that's wrong, but Bundle 2, page 58. So, this is events in the second half of '17. Would you have been aware of this when you returned from sick leave?

A No.

Q Were you aware of these PAGs when you were dealing with the March-- the May 2018 incident?

A Yes.

Q Right. Are they part of the same story in your mind or separate?

A They're separate.

Q Why are they separate?

A Different strains. So, the IMT that I chair, I talk about a previous strain. I'm talking about a previous strain in the Paediatric IT unit. So, there were cases. We had a line listing and there were cases with a particular strain, five, I think it was, that were attributable to the PICU at that time in 2017. I don't know if there was ever a PAG or an IMT, but there were previous cases in PICU, which is what you would expect for this organism because it persists.

Q Well, there was a PAG because we're looking at its----

A That's Neonatal unit, I believe, that one.

Q Sorry. The next one is-- No, you're absolutely right. The next page, just for completeness then, page 60, we should look at it. Page 60, please. So,

that's a different ward as well. Which ward is that?

A That's 3A. I can't actually remember what's in 3A. I think maybe a general ward or surgical.

Q The point I'm trying to raise is, albeit the patients are different, if you're suspicious of an environmental ventilation link in the May PICU case that's described in your statement, what sort of questions will we be asking ourselves about these two PAGs the previous year in different parts of the Children's Hospital of a similar, albeit different strain of Acinetobacter.

A It could be ventilation-related, but equally it could be water or it could be reflective of issues with cleaning and dust in the unit, so----

Q The question that I want to understand – and this may be the wrong example to do it, so – is that quite often one sees, particularly the year you're not there, PAGs for bacteria species that we've learned to recognise as unusual, because people tell us they're unusual, that attract a PAG, but no IMT follows, whereas you seem to get the impression that, when you are around, it's the water incident, and therefore things are being rolled up into the big IMT.

A Yes.

Q Is there any element of – "reluctant" is the wrong word – a non-

upgrading of PAGs to IMT happening when you're not there that you've noticed?

A I know that when I came back there was a view that the triggers that I had set for action were too sensitive and that too many PAGs were being held. So I think there was a view that, yeah, I was reacting to things too often, but my assessment of that is that there were issues with the building, and I felt that the triggers were indeed picking those things up.

Q So, who thought the triggers were too sensitive?

A I believe it was the associate nurse director at the time who sent the emails.

Q Ms Devine.

A Yes.

Q Okay. Now, what I want to do is take this off the screen and just move forward to what has been called by somebody, and I have forgotten whom, the emergence of the DMA Canyon report in 2018. Now, if we can go to your statement, page 212, at page-- how you describe receiving a contact from the medical director at 8.30 a.m. Is this a phone call or an email?

A A phone call.

Q A phone call, and did she tell you anything substantive about the contents of these reports?

A She told me that she had briefly looked at them and she was concerned that there had been a number of issues detected in these reports. I think she mentioned to me at that point something about uncapped pipes.

Q Did you ever have a substantive conversation with Dr Armstrong about what was actually said in the report?

A Just this phone call, she----

Q But nothing since then?

A No.

Q And you then went and got the reports?

A I did, yes.

Q And you eventually received them in electronic copy as well?

A No, I never ever got an electronic copy. I was told they were only available in hard copy, so I had to travel over to the old Yorkhill Hospital and pick them up.

Q Who told you they were only available in hard copy?

Q I believe it was either Dr Armstrong or Tom Walsh himself.

Q All right. Now, on page-- Well, elsewhere in the statement – I don't think we need to go to it because it's a passing remark – you mention your astonishment that people in the water incident IMT knew about these reports and didn't mention them to you. You're nodding

again.

A Yes.

Q Who do you think knew of the DMA Canyon reports who was dealing with you at the time of the water incident, who didn't bring them to your attention?

A At that time, I felt it would be Estates colleagues and the Director of Facilities.

Q And so that would have been whom?

A Mary Anne Kane and Ian Powrie and Alan Gallagher.

Q And if you go to page 215 of your statement, at paragraph 644, you describe what you might have done if you'd been told about it in 2018, but also what you would do about it in 2015. Do you see the first line?

A Yes.

Q You've said you wouldn't have opened the hospital.

A Yes.

Q Now, it's been suggested that that's an extreme response, given there were so many other knock-on consequences for services across Glasgow. Do you think you would have succeeded in delaying the opening of the hospital?

A I don't think so, but I would have tried.

Q And what would have been your argument that you would have presented at that point?

A Because this hospital was going to be housing some of the most immunosuppressed and sick children and adults who would be at high risk, and I would extend that out to other groups so all the augmented care units that we were to have so several ITU beds I think over 60, pediatric ITU, cystic fibrosis, so there would be lots of high-risk patients in that building.

Q And you were then the sector--regional sector ICD.

A Yes.

Q Who would you have had to convince?

A Professor Williams.

Q And that was your reporting structure?

A Yes.

Q Right. If we look towards the second half of that paragraph, you see the line begins “IMT in 2018” and you say:

> “I was trying to work out what had happened in this water system and I was trying to generate a hypothesis, when in fact, when people in the room had had sight of the report and knew exactly what was going on in the water system, and didn't say anything... If they spoken up at this point, then we

could have implemented relevant control measures very quickly and we could have removed the children much sooner which in turn would have prevented infections."

Now, I'd like to break that down. So, what would have been the relevant control methods you could have implemented very quickly?

A So, point-of-use filters, but we could have made a start on the chlorine dioxide system.

Q Because the point-of-use filters went in within a matter of weeks.

A Yes.

Q So, could they have been done any faster, realistically?

A They could have been, yes, they could have been.

Q Because-- How would that have happened, because there was quite a lot of push back about testing of them and things at the time, wasn't there?

A Yes, so, there was a reluctance at the time to use point-of-use filters. We hadn't really used them in Glasgow before and there was a suggestion that they weren't necessarily a good thing because they could then become a source by trapping the bacteria of what we would call retrograde contamination back into the system. So, there was some reluctance initially to go down that route, really, because I think

they were unknown and we hadn't used them before, so we had to get portable sinks and other things in place.

Q You think it would have been a little bit quicker by, what, a matter of weeks if you'd known about it at the time?

A Mm-hmm.

Q Right. Then you mention the chlorine dioxide system. How many-- How long did it take you then to fit the chlorine dioxide system from the start of March of 2018, and how many months did it take?

A Oh, several, into 2019, I think.

Q So more than six months.

A Yes.

Q How quickly could it have been fitted, do you think, if you'd had this extra urgency?

A Well, we could have at the time perhaps gone down a different route, and we could have gone down a route of what we call shock dosing, which could have been implemented very quickly.

Q And that would have involved maybe chlorine dioxide, maybe other things?

A Yes.

Q Right. When you say, "We could have removed the children much sooner," what does that mean, because when you eventually decant, you don't decant away from the water system, do you? You decant to the same water

system.

A Yes, that's correct.

Q So, what do you mean by, you could have removed the children much sooner?

A I don't actually know what I mean with that. Sorry.

Q Do you think you could have removed the children sooner?

A No, I don't think-- because where would we have put them? That was the challenge.

Q Yes, because when you look at Jamie Redfern's options paper for the decant, they look at-- you look at alternative options, don't you?

A Yes.

Q And they're not very attractive?

A No.

Q No? Right. If we go on to the previous page, paragraph 639, you mention at the end of that paragraph:

> "My recollection is that in April/May 2018, HFS got access to ZUTEC, and I think... they came across Intertek and DMA Canyon reports."

Can I suggest to you that actually what might have happened is that HFS obtained them from the Health Board in April 2018 via a simple request for documents?

A What I remember from that

time is that, around April, Mary Anne Kane was trying to get documents which included water testing results, and also the risk assessments were mentioned in an email, and I'm sure at Water Technical Group she was referring to Ian Storrar interrogating Zutec, and she'd given him access to see if he could find things.

Q Right.

A And then when the medical director phoned me, she mentioned that HFS had found things, so that's why I say "I think". I don't know for sure.

Q Is it possible that all of those separate facts are correct, it's just that the connection is not right? In the sense that Mr Storrar might well have been interrogating Zutec?

A Possibly.

Q HFS might have found them----

A Possibly.

Q **--** Mary Anne Kane might have been looking for them, but they didn't find it on Zutec?

A That's possible, yes.

Q Right. Now, if we can go to bundle 27, volume 8, document 32, page 180. No, that's definitely the wrong place. Page 120 of that? Yes, right. So, this is from September, early September 2018. Can you explain what this email to Mr Walsh might be about, what these triggers are? Because this is a time-- You're not involved in this conversation,

but you're involved as lead ICD, and I wonder if you might be able to help us understand what is-- I didn't put it to Mr Walsh.

A So, I recall discussions with Annette Rankin as to what would trigger a new IMT, and I think the view was that any case should be investigated by the IPCT but not necessarily trigger an IMT, and I think we set a trigger at what's listed there as 2 cases in 14 days for an IMT.

Q Right. So, this is them just effectively reporting that they reverted to those established figures-- triggers on 6 August?

A Yes. So, there is reference to me deviating from that trigger, in that I am triggered at two different organisms.

Q I just wondered why this matters. Obviously I have to ask Sandra Devine, but I wonder why it matters.

A It reads to me potentially that she was disagreeing with me.

Q But this is a matter of a couple of weeks before the decant decision.

A Yes.

Q Right. Now, if we take that off the screen? We've discussed biofilms, which I wasn't going to do at this point, so we can pass over that. I'd like to turn to an email exchange with Mr Hoffman. So, if we go to bundle 14, volume 2, page 140. So, is this the final email in the exchange between you and Mr Hoffman

on or about 16 of September? Which is the day before the decision on decant.

A I believe so, yes.

Q Now, what I'd like to do is go to the beginning, because it makes it so much easier to understand what's happened. So, if we scroll downwards through the document, we get to page 147, "Kind regards, Teresa". So, we see the email is above that, on page 146, and do you see in the middle of that page there's a discussion about aerosolisation?

A Yes.

Q Right. So, what was your concern about aerosolisation at this point?

A So, when faced with this issue with the drains, I started doing a lot of reading of literature around potential routes of transmission and how that might happen, because that was, I think, one of the, sort of, questions that kept coming up at the IMT. So, people understood there was a risk from the drains, but people couldn't understand how it was getting from the drains to the patient. So I was doing a lot of reading, and I came across papers that were suggesting aerosolisation.

Q So, what would that have involved if it had happened? So, what is aerosolisation?

A Basically, it's how the bacteria are released from the biofilm. Well, the

thinking on this has all changed, but at the time there were different sizes. So, droplets were larger than aerosols. So, I'm talking about the smaller particles.

Q Right. So, you thought they were being thrown up by the drains?

A Yes.

Q Right. Did you get a reply from Mr Hoffman that starts at the bottom of page 145?

A Yes.

Q If we go down to the bottom of the page. Sorry, 143. My mistake. The bottom of that page, please. Yes. In essence, is Mr Hoffman responding by saying that, effectively, it takes a lot of energy to generate aerosolisation?

A Yes, he is.

Q And over the page he says he doesn't:

> "... see activities related to sink use or cleaning as having the energy input to produce significant aerosols."

A Yes, that's what he's saying.

Q Yes. Did you understand that at the time?

A I understood what he was saying at the time, yes.

Q Yes. If we go right to the beginning of the final message in the email-- Well, that'll do for that bit. So, basically, we have that email thread. It's a very long email thread, and would it be fair to say that he's disagreeing with you about the hypothesis that aerosolisation could have been an issue?

A Yes.

Q Right. If we go to the IMT on the-- well, the IMT that immediately follows this, which is bundle 1, document 38. So, this is 14 September. This is before you contact him. Your-- Actually, your intention to contact him is mentioned in the IMT minutes, isn't it?

A Yes.

Q Yes. We go to the next meeting, which is document 39, and that's the IMT on 17 September. That's after-- the day after the email thread ends, and we see, over on page 171, you're narrated in the minutes. Of course, you're chairing these, so you can make sure the minutes are right?

A Yes.

Q Yes:

> "[You'd] spoken to Mr Hoffman, and in his opinion you should not have to clean drains continuously and that the underlying issue should be resolved. He was concerned regarding the risk of dispersion of bacteria by cleaning... and he was still to see our drain cleaning SOP..."

There's no mention here of you

telling the IMT the aerosolisation is off the table, is there?

A No.

Q Why didn't you tell the IMT this?

A Because, as an Infection Control doctor, it's not about which route is the most likely. If any of these routes are possible, then you're going to target your interventions for them all. It doesn't matter that it's predominantly aerosols or predominantly droplets, and we can, you know, debate that, and there was different views in the literature around this. It's about making sure you target all the routes of transmission. So, I expect I didn't raise it because I didn't want that to be the focus and people to forget about droplets and splash into surrounding areas, that sort of thing.

Q I suppose this is-- one of the problems with IMTs is that-- how many people in that IMT had the technical knowledge to go away and have that conversation with Mr Hoffman and, as it were, have it as something close to equals?

A I would say very few. Potentially colleagues within HPS and HFS.

Q But equally, how are the Estates people particularly in this meeting, who aren't Infection Control trained, or maybe even the treating clinicians, supposed to react when you say, "I'm going to speak to Mr Hoffman and get his views," and then you don't report back all his views?

A I think it's more than just his views. So, his background is engineering, and that's where he is coming from, but from an Infection Control perspective I am more concerned about routes of transmission and blocking those, if you see what I mean.

Q So, you're more concerned of the output rather than the explanation?

A Mm-hmm. I'm not-- You know, I knew at that point that there was debate as to whether it's aerosols or droplets. For me, the fact that both could be potential, I have to target both of those routes of transmission.

Q So, Mr Hoffman's advice doesn't prevent you from-- you still have to do whatever you've----

A No, I mean it's advice and, you know, he's always available and very good at giving advice, but I guess it's up to an Infection Control doctor to assess that, and it's not just about the engineering aspects, it's the whole picture. The other thing about this is, Mr Hoffman hadn't seen the condition of our drains. These weren't normal drains by any means.

Q Right. I'd like to just check on one document before we move on, which

is, we had some evidence from Ms Harvey-Wood and Dr Peters about them doing a presentation to the haemato-oncology consultants in June or July of 2018 and then them producing a report in October. Did you ever see that report?

A I did, yes.

Q Right. I just wanted to check that, because we'll come back to epidemiology later. Now, I think where we are, we're just a moment or two before four o'clock, and I'm going to look to his Lordship and see whether we want to start on the story of the decant or wait until tomorrow.

THE CHAIR: I'm really in your hands, Mr Mackintosh. I don't want to sit – unless there's reason to do so – long after four o'clock, but if you can sort of take a useful step in 10 minutes, please do that.

MR MACKINTOSH: I'll try and do that, yes. I'll try and get a little way down the journey. What I want to do is, we've got a period between, I suppose, Sandra Devine's email which we just looked at in early September and the decant-- actual decant, 26 September.

A Yes.

Q What would you characterise the mood of the IMT and the meetings you had with executive board members in that two-or three-week window in respect of you and your work?

A I think the IMT-- there was obviously a lot of anxiety about the risk in the unit. We were not on top of the issues with the drainage system, but equally there was anxiety about moving patients to a different ward within the hospital. We didn't know at that point what time it would be. So, there'd be clinician anxiety at the IMT.

In terms of the sort of executive group, I do remember going to a meeting. Myself and, I think, Kevin Hill gave an update on the situation, and that the IMT were essentially recommending a decant. I remember them asking for more information before they made that decision. Particularly, they wanted more information about the drainage system and the extent of the problem with the drains.

I remember them tasking the Infection Control nurses to go and inspect most of the hospital and RHC to check the condition of the drains. So, it wasn't an immediate decision. It was delayed because they wanted more information about the drains.

Q So, before we come back to whether that was, from your point of view, the right thing to do at the time-- and I probably just connect this all to the dates. So, let's look at an IMT on 14 September, which we've already been to, actually, which is a bundle 1, document 38, page

164. So, that's at one o'clock, and you're in the chair.

A Yes.

Q I notice, for example, that Ms Rodgers and Jamie Redfern are present, but then they have responsibility over the paediatric patients. I notice that Susie Dodd is the lead ICD. Have I got that right?

A Susie Dodd is the----

Q Lead ICN, sorry.

A -- lead ICN, yes.

Q I've got Mary Anne Kane from Facilities.

A Yes.

Q Dr Kennedy is here from public health, Annette Rankin from HPS, Mr Walsh from the ICM. Pamela Joannidis, what role she performing at that point?

A Pamela at that point I think may have been a nurse consultant.

Q Then Sandra Devine is the associate nurse director?

A Yes.

Q Karen Connolly sees some Facilities?

A Facilities.

Q I don't know Ms Taylor. Mr Hill, now, he's---

A Director of Women's and Children's.

Q It's his function that you're discussing effectively?

A Yes.

Q Right. I don't know Ms Thomson or Ms Cook or Mr Wilson or Ms Howard, but-- and Callum is there with the minutes as always. Now, what I want to understand about is at the end-- if you look at this meeting and we go to, is it after this meeting that you have the meeting that you go with Mr Hill to meet some senior people?

A I think so. There is a summary of that meeting from Tom Walsh.

Q There is, and that's bundle 27, volume 7, document 8, page 241. Yes, if we go to the next page, if we zoom out so we've got the whole page, is this the meeting you've just described where they want information about the drains?

A Yes.

Q And that's in the afternoon, I'm taking it?

A Yes.

Q Right. Now, this meeting comes up with some actions.

A Yes.

Q Now, is this meeting effectively doing what you would wanted the executive control group to have been doing all the way along, but on an ad hoc basis?

A Yes.

Q Right. Now, what I'm getting-- the impression from the action points is that there’s a requirement to examine the drains as you described. Why would you

need to examine the drains because presumably you've done this already?

A Not further back though Very superficial of the-- examination of the drains that only the-- you know, we could see, but not-- you know, this refers to putting a scope down the drains and looking further back within the drainage system.

Q How would the Infection Prevention and Control Team, all the nurses and Sandra Devine be able to put a scope down drains? Is that something they have skills for?

A No, no, that would be an external contractor.

Q Right.

A It says, "endoscopic review of the drainage system." That's what that means.

Q And then at the bottom of the page, we have entries that discuss a four -week period and a four-week time frame.

A Yes.

Q Is that the anticipated length of the decant, or that the decant will happen in four weeks time?

A Initially, the decant was planned to be very short, so it may indeed refer to a short decant.

Q In Dr Kennedy's evidence, he describes going to a meeting after the 14 September IMT where this sort of conversation is taking place. Was he at this meeting with you and Mr Walsh?

A I don't remember him being there.

Q Because might there have been a later meeting over the weekend? Are you aware about whether there was another meeting?

A I can't recall any other meeting.

Q So, the reason I'm wondering about this is if you look at the IMT of 17 September, that's bundle 1, document 39, page 169. So this is 17 September, one o'clock. Again, roughly the same people are here, but if we go to the bottom of page 171, is this describing the same output?

A I believe so, yes.

Q Right, okay. Maybe I'm just seeing things that aren't there. From your point of view, looking at the decision then, what did you think of the decision to wait for an endoscopic test-- investigation of the drains?

A I suppose what we were suggesting was a fairly big step to decant children. So I could understand the need for further investigation and I'm supposed to be absolutely sure that we were doing the right thing. I wasn't sure what that was really going to add though because I could see the problems.

Q I suppose the context partly-- there's Mr Redfern's options appraisal,

which I don't need to put on the screen but I'm assuming you saw at the time.

A Yes.

Q Right. Some of the options there involve going to different locations.

A Yes.

Q You're nodding again.

A Yes.

Q Building a temporary hospital ward----

A Yes.

Q -- and a car park, courtyard. So those are going to take some time to bring in.

A Yes.

Q But moving elsewhere in the hospital could be quicker?

A That's correct.

Q Right. So, at that point, what's your attitude to the importance of speed? Is it something that should be encouraged, or is care and time primary thing here?

A I felt it should be encouraged, but I appreciate that it's, you know, a major undertaking to move a ward and that does require careful planning. So the other side of that is that we needed to identify an area but we needed to make sure that area was safe. So we can't just move children straight away into a ward. We had to do some work in that area that was chosen.

Q If you think about the options paper and the range of different options and this context of all the issues you've described, are you comfortable with the decision that was ultimately made to move to what became 6A?

A I am, yes.

Q How do you react to the suggestion that one of the weaknesses of that is you're effectively moving elsewhere in the same water system?

A So, there were some advantages to moving to 6A. We were able to decant the higher-risk patients into Ward 4B, into the BMT rooms there. Ward 6A was slightly different in that it didn't have the trough sinks, which had been recognised as a risk. It also did not appear to have the same issue with the drains. I don't know if that was because they were higher up the building. I don't know if that relates to workmanship, but the drains were not in the same state, and we didn't have-- and it was a disadvantage for the children, we didn't have the playroom or the classroom which had these small sinks with a lot of splashing. We had adult size sinks which brings other problems, but there was less risk in moving to 6A. There was still risk, but there were some features of 6A.

Q So, you think that some of the features that caused the risk in 2A to be larger weren't present in 6A?

A Some of them yes.

Q Did the fact that you were moving to a general ward with three air changes an hour play any part in the decision from your point of view?

It was obviously a risk, but they were in that same sort of ventilation strategy there, and I think because the drains weren't in the same condition there I was less concerned about this issue with potential aerosolisation and inadequate dilution.

Q Right. Now, I think we can get to a moment of decision by looking at the next IMT, which is the IMT of 18 September, which is in bundle 1, document 40, page 175, and if we go on to the next page, and the next page, the next, stop there, please? We see in the middle of the page, heading six, "contingency decant". We get the report back from Grant Archibald.

A Yes.

Q So, I suppose my question is, who made the decision to decant the patient out of Ward 2A?

A Ultimately, I believe that was the chief executive, but based on a recommendation from the IMT.

Q Would you have ever seen the minute of the water review meeting on 18 September that morning?

A No.

Q No. Would you have been aware of that meeting?

A I don't know anything about that meeting.

Q Given that this is a Tuesday and the previous day the IMT has been told about what looks like the meeting you were out with Mr Walsh on the Friday that we're going to wait for the drains to be inspected.

A Yes.

Q Can you help us, or were you told of why there was this 24-hour change of heart by those making the decision?

A No.

Q Did anyone give you any explanation?

A No.

Q Was the drains ever examined with endoscripts?

A I was told that they were, but I never saw a report.

Q The final thing about this is that when we look at the minutes of the water review meeting, we see that mR Walsh attended it, the one that made the decision.

A Yes.

Q Is there anything that we should think about the way that Infection Prevention and Control works that the manager goes to this board level meeting but no one tells you what the discussion was?

A Yes.

Q What do we draw from that?

A It's a concern particularly as I was the lead ICD and the person chairing the IMT. So, I didn't know these meetings existed until I saw them in the bundle. I would have expected to have been there. I think that I would have been the person that could have given the most intelligence about the situation to the chief exec and the HAI exec lead because I had the relevant expertise.

Q I think, my Lord, this is probably the right place to stop.

THE CHAIR: Yes. We'll do that. Dr Inkster, can I ask you to be back tomorrow for 10 o'clock?

THE WITNESS: Thank you.

THE CHAIR: All being well, we'll see each other tomorrow at 10 and, until then, have a good afternoon.

(Session ends)