SCOTTISH HOSPITALS INQUIRY

Bundle of documents for Oral hearings commencing from 19 August 2024 in relation to the Queen Elizabeth University Hospital and the Royal Hospital for Children, Glasgow

Witness Statements – Week Commencing 26 August 2024 – Volume 2

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Scottish Hospitals Inquiry
Witness Statement of Questions and Responses
Tom Makin

This statement was produced by the process of sending the witness a questionnaire with an introduction followed by a series of questions and spaces for answers. The introduction, questions and answers are produced within the statement.

Personal Details

1. Please set out your professional background and qualifications. Please describe the activities of Makin and Makin Consultancy Limited and explain when and why you decided to set it up. What are its specialisms? Do they reflect your own?

A Dr Thomas Makin BA, PhD, FIBMS, FRSPH, FWMSoc, CSci. I was employed from 1968 in the NHS initially as a Medical Laboratory Technician and subsequently as Biomedical Scientist. I worked in various hospitals in Liverpool - Newsham General Hospital, Mill Road Maternity Hospital, Broadgreen Hospital, Liverpool Royal Infirmary (LRI), and latterly at the Royal Liverpool University Hospital (RLUH).

After undergoing rotational training in all aspects of medical laboratory sciences (Haematology, Medical Microbiology, Clinical Chemistry and Histopathology) I specialised in Medical Microbiology while at Newsham General Hospital. I occupied posts of Senior Biomedical Scientist at LRI, and Chief Biomedical Scientist and Senior Chief Biomedical Scientist at RLUH. My last post in the NHS was Directorate Manager of Medical Microbiology at RLUH and I retired from this in 2010.

As a Biomedical Scientist in the department of Medical Microbiology at the RLUH I investigated an outbreak of Legionnaires' disease (LD)

which occurred at the RLUH shortly after it opened in 1979. There was little known about this disease or the causative organism (Legionella) in the UK at this time as this was just 3 years after the first recognised outbreak of LD which occurred in the Bellevue Stratford hotel in Philadelphia in the USA in 1976 at an American Legionnaires' conference. This generated my interest in Legionnaires' disease and waterborne infection in general.

I have published several papers on Legionella and water quality in peer reviewed journals and technical journals and have presented many papers at various conferences and seminars in the UK, USA, Europe and Middle East. I submitted my thesis on Legionnaires' disease in the hospital environment and was awarded a PhD in 1995 by the Medical Faculty at the University of Liverpool.

I was invited by the UK Health and Safety Executive to participate as a co-author in producing the first Approved Code of Practice (ACoP) and Guidance (L8) on Legionnaires' disease: The Control of Legionella in Water Systems which was published in 2001, and I assisted the HSE in updating this document which was published as separate ACoP and guidance (parts 1 to 3) in 2014.

I have advised the Department of Health and many hospital Trusts on managing risks and complying with guidance and relevant regulations regarding water quality. I assisted in the production of NHS Estates Technical Memorandum on the Control of Legionella in Health Care Premises (HTM 2040) and was a member of the working party that produced the Department of Health Legionella guidance (HTM 04-01) which replaced the previous guidance (HTM 2040 and HTM 2027) in December 2006. I was a member of the steering group that produced the updated HTM 04-01 which was published in 2016. I assisted the Department of Health in producing the addendum to HTM 04-01 on the control of *Pseudomonas aeruginosa* in water systems in augmented care units which was released in March 2013.

I was a member of a committee of the Standing Group of Analysts (Environment Agency) which produced the technical guidance on the sampling of water systems for legionella bacteria BS: 7592:2008, this was in use until it was updated in 2022. I developed a procedure for the rapid detection of legionella bacteria in water systems, and using antibody techniques monitored the incidence of legionella infection in immuno-compromised patients and others in the Royal Liverpool University Hospitals (PhD thesis).

I managed a 3-year collaborative study for NHS Estates, which evaluated the efficacy of a biocide (chlorine dioxide) in controlling legionella bacteria in the hot and cold water system of a hospital where an outbreak of Legionnaires' disease had occurred. The outbreak was resolved following dosing of the potable water system with chlorine dioxide.

I have evaluated the efficacy of a variety of other measures for controlling legionella and other bacteria in hot and cold potable water systems, including regular flushing of outlets, self-purging showers, trace heating elements, automatic drain valves, ultra-violet light systems, re-circulating cold water systems, downward displacement v swan neck taps, and point of use filters.

I am a Fellow of the Institute of Biomedical Sciences, A Fellow of the Royal Society of Public Health, a Fellow of the Water Management Society and a Chartered Scientist.

Makin and Makin Consultancy Ltd was incorporated on 16th February 2007. It comprises me as Director and sole consultant and Ms S A Makin, microbiologist and company secretary. The company advises on a range of issues associated with the control of legionella and other microorganisms in a variety of water systems. It has advised on microbiological contamination of air, food and foodstuffs, and water used in industrial processes. Makin and Makin Consultancy Ltd can

undertake water quality audits and has provided services as expert witness, and Authorising Engineer (water) in healthcare premises advising Water Safety Groups.

Makin and Makin Consultancy Ltd has provided services to government agencies in the UK and other countries and municipalities, various large manufacturing companies, Estate and Facilities Management companies, water treatment companies, Metropolitan/Borough Councils, hospital Trusts and other health care premises, hotel chains, cruise lines and others. Currently, services are provided predominantly to healthcare premises.

I decided to set up Makin and Makin Consultancy Ltd because I was approaching retirement after 42 years as a medical microbiologist in the health service and felt that given the amount of knowledge I had acquired on water quality over many years and the time I had invested in ensuring that water systems were managed to prevent microbial contamination and associated waterborne disease, that it was inappropriate and wasteful to end my association with water systems when I retired. I enjoyed the link between environmental and clinical microbiology and wanted to keep on using the knowledge I had to provide practical advice and guidance on water quality particularly to health care premises.

Your Initial Involvement with QEUH/RHC

2. The Inquiry understands that you first became involved in the QEUH/RHC after being contacted in April 2018. Who made initial contact with you? What reasons were given at that time for your involvement? What were you told at that point about issues at the hospital for which your input might be useful? Was that sufficient to enable you form an understanding of what might be involved?

A I was first contacted via LinkedIn in April 2018 by Ian Storrar (IS) who I believe was Principal Engineer for Health Facility Scotland at that time. IS may have attended a lecture I gave on microbial aspects of water quality at a seminar in Scotland or one I gave in the Northeast of England. I was asked if I could assist at Queen Elizabeth University Hospital and the Royal Hospital for Sick Children (QEUH) with a water quality issue they had in their potable water system. IS didn't provide a lot of detail but asked me to contact Ian Powrie (IP), Deputy General Manager, Estates at QEUH to get more information and to arrange a visit to the hospital.

I contacted IP by email on 27th April 2018. He telephoned me on 30th April 2018 and provided me with more information, and that evening contacted me by email inviting me to attend QEUH to see the size and configuration of the water system. The email IP sent contained a plan of the site, a draft meeting report dated 25.04.18 produced by Dr Susanne Lee FAO Theresa Inkster **(A38271789 – Glasgow draft report)**, a report referred to as QEUH sanitisation paper (Rev 2) dated 26.04.18, a water services schematic diagram for QEUH, and a diagram showing the storage tank arrangement, filtration plant and booster pumps at QEUH.

Dr Susanne Lee's (SL) report outlined various factors contributing to microbial contamination of the potable water system. SL had attended QEUH in April 2018 and her report on microbial contamination of the water system focussed on the children's hospital. On the day I attended the first meeting at QEUH (10.05.18) IP emailed to me a spreadsheet of microbiology results from many water samples collected on 2nd and 3rd of May 2018.

The discussion with IP on the phone and the papers provided indicated that there was extensive microbial contamination of the potable water system with a range of different microorganisms, and that the water system appeared to be the source of infection in some

immunocompromised patients in the haemato-oncology unit on wards 2a and 2b.

I first attended QEUH on 10th May 2018. I met with IP about 8.30am in his office in the Laboratory Medicine and FM centre. We talked for a while about the issues at QEUH and the extent of the microbial contamination and possible sources. I was then given a relatively brief tour around parts of the site focussing on the potable water systems. It was a very large site and I only saw part of it as I was required to attend a meeting at 11am with members of the Incident Management Team which I believe was specifically arranged for me to be introduced to the team and some of the issues they were dealing with regarding the contamination in the potable water system.

I also met with Dr John Hood Consultant Microbiologist that morning. I had met Dr Hood many years previously (circa 1995) when I was organising the first hospital-based trial of chlorine dioxide (ClO2) at Broadgreen Hospital in Liverpool. Dr Hood had heard of the trial and visited me to discuss it as I understand he had a Legionella contamination issue at that time at Glasgow Royal Infirmary (GRI) for which he was considering using ClO2.

Dr Hood subsequently published a paper in the American Journal of Infection Control (2000.28(1) p.86) entitled; *Six years' experience with chlorine dioxide in control of Legionella pneumophila in potable water supply of Glasgow Royal Infirmary* **(A49541924 – Extract – American Journal of Infection Control – 4th Decennial International Conference on Nosocomial and Healthcare – Hood et al – Page 86) (A49542934 – Dr T Makin – Screen Shot – Reference list showing publication of Hood et al (2000) American Journal of Infection Control – Issue 28 Volume 1)**. I believe the paper reported that ClO2 had been effective in controlling the contamination. Dr Hood's knowledge and expertise in this area will have been of value to QEUH at this time.

After being shown around parts of the site by IP, I attended a meeting and met with some of the members of the Incident Management Team. I believe this was attended by IP, Dr John Hood, Ian Storrar, Annette Rankin (Nurse Consultant IPC), Dr Teresa Inkster (Lead Consultant IPC), and Mary Anne Kane (Interim Director of PPFM).

I did not receive a formal contract or terms of reference for my engagement and as far as I can recall it was not explained to me how long my services would be required. I was invited to attend some of the Water Technical Group meetings (WTG) also referred to as the Water Review Meeting [Technical], and I was asked to produce two reports on Clorious2 and manual v automatic flushing of taps. Purchase orders for my services were provided as and when I was required to produce a report or attend a WTG meeting.

I was informed that I would not be required to attend all the WTG meetings, and my engagement did appear to be largely on an ad hoc basis. I normally inquired after each WTG meeting that I attended when I would next be required.

After one gap of three months without contact from QEUH I inquired if my services were still needed. I was informed by IP that they were but the next WTG meeting I attended was not for some months, a total of eight months between meetings. This raised initial concern for me because to maintain control of the water system I felt regular meetings were important, and I was not aware if WTG meetings occurred in my absence. From minutes I received of WTG meetings that I did attend I became aware that other WTG meetings were taking place, and from the minutes provided in the bundle it appears that these were frequent, which is reassuring.

Bundle 10 of the papers for this inquiry contain minutes from Water Technical Group / Water Review Group meetings from 6th April 2018 to 22nd April 2021 (A47395429). During this three year period there

were 55 meetings and as far as I can recall from my diary and notes I attended 8 of these WTG meetings. It appears from the available minutes that the meetings were originally weekly but became biweekly, monthly, and then moved to approximately every two months. I attended WTG meetings on the following dates 27.06.18, 31.08.18, 26.04.19, 19.07.19, 16.08.19, 13.09.19, 17.04.20, and 18.09.20 which I believe was my last meeting at QEUH.

In attending these meetings and receiving correspondence and documents by email, mainly from IP, I believe the information I was given was adequate to enable me to form a reasonable understanding of the extent of the contamination at QEUH and what was involved in controlling it, although I was not involved in the detail of all of the various control measures.

I am now aware that there was information available at that time which I don't recall seeing until quite late into the period of my engagement e.g. the 2015 Legionella risk assessment which identified several deficient features of the water system and its management. This information would have been useful for me to see, but it wouldn't have made a significant difference to the advice I gave to the hospital.

As I understood it my role was to provide advice on the prospective measures for controlling microbial contamination of the water system to help reduce risk of nosocomial waterborne infection, rather than focussing on the possible causes of that contamination, although some knowledge of the latter was appropriate.

3. The Inquiry understands that that first contact led to a meeting at the hospital in May 2018. Who were you dealing with during that intervening period? Were you given further information prior to the meeting? Were you content that what you were provided with would be sufficient to address the issues that you understood at that time might be involved?

A My main contact at the hospital until he left on 2nd July 2019 was Ian Powrie (IP). Prior to my first meeting on 10th May 2018 IP provided me with various documents listed in Q2 above. I believe the information I was given was adequate to commence with as further information was revealed in the meetings with IP and the Incident Management Team. See my response to Q2.

4. Who was that meeting with, in May 2018? How was the then state of the water system at the QEUH/RHC described to you? What were you asked to do for NHS GGC? Did the issues raised at that meeting reflect the issues raised upon the initial contact? Did you have confidence at that time in the people with whom you were meeting, in terms of their knowledge of the water system?

A See my response to Q2. I was informed by Ian Powrie (IP) before and at my meeting with him on 10th May 2018 that there was extensive contamination of the water system and that a wide variety of bacteria and some fungi had been detected in water samples. I can't fully recall when, but I understand that around the time of the first meeting or shortly afterwards I was informed that bacteria had been recovered in large numbers from tap flow straighteners.

As I recall, at the meeting with members of the Incident Management Team on 10th May 2018 I was asked to briefly give my opinion on the likely source of the contamination in the water system and suitable control measures. I mentioned my experiences at other hospitals and particularly regarding contamination following construction of new buildings and refurbishing of wards. I commented on my experience with chlorine dioxide and other biocides. Subsequently, on 8th June 2018 I was asked by IP to produce a report on an assessment of the biocide Clorious2 for the treatment of the hot and cold water system at QEUH, and on 27th June 2018 I was asked by IP to produce a report on manual v automatic flushing of taps.

My initial contact at QEUH was IP and he remained my main contact until he left the hospital on 2nd July 2019. In my opinion he was very knowledgeable of the water system at QEUH, and he appeared thorough, effective, and keen to resolve the issue of the contamination in the water system. The members of the Incident Management Team (IMT) who I met on 10th May 2018 all appeared very competent and committed to resolving the problem of the contaminated water system. From the available minutes it was apparent that some of the IMT had been attending weekly meetings as members of the Water Technical Group (Water Review Meeting) since 6th April 2018 and had discussed many aspects of the water system and various remedial measures.

5. What did you discuss at the meeting? What role was decided upon for Makin and Makin?

A Please see my responses to Q2 and Q4. On behalf of Makin and Makin I was to attend the WTG meetings to which I was invited and advise the hospital where I could on the contaminated water system and produce two reports on biocide dosing and manual v automatic taps.

6. When did you first get to see the water system? Please describe, to the best of your recollection, your initial thoughts about the issues raised? In particular, did you have any concerns about its size and complexity, its operation or its management?

A I first saw the hospital and its water system on 10th May 2018. I do recall approaching it for the first time and discovering that it had been built next to a sewage treatment facility. I was shocked by this and did comment on it when I first met Ian Powrie (IP). I was very puzzled as to why it had been allowed given that the hospital contained very immunocompromised patients. I was concerned regarding the possible implications for the hospital and its patients arising from potential increased transmission of microorganisms from the sewage treatment facility. Airborne transmission of microorganisms from sewage treatment works is well documented.

After my initial meeting with IP he showed me around parts of the hospital water system. The hospital was very large, one of the biggest I had encountered in my career, and it became increasingly clear to me given its size and complexity that the contamination of the water system could prove difficult to control. I recall considering that new hospitals often suffer from contamination of the water system arising during the construction phase and how it can be difficult to manage the quality of the potable water following occupation of the building as higher levels of biocide used to control the contamination can't readily be used.

It was reported that large numbers of different types of bacteria had been recovered from various parts of the water system and some of these had been associated with infection in immunocompromised patients. The presence of such a variety of bacteria suggested to me the presence of established biofilm within the system and as bacteria were detected in various locations it indicated the contamination was widespread.

I was concerned that biofilm may have been allowed to develop during construction of the building after the hot and cold water systems had been filled, because in my experience once biofilm becomes established early in the development of a building it can prove very difficult to control, and it is not unusual to encounter microbial contamination in the water systems of newly opened hospitals due to the problems that can occur during construction.

Dr Susanne Lee's report (SL) dated 25.04.18, noted that the water system had been filled during construction and remained so for over 12 months prior to it receiving patients. If regular flushing did not occur during this period, then water in the cold water system in particular would effectively stagnate or remain relatively static and this would encourage heat gain and associated biofilm development in different parts of the cold water system. The hot water system is designed to continuously circulate even in the absence of tap outlets opening, so providing this

circulation is properly balanced it should not stagnate except for the areas after thermostatic mixing valves where hot and cold water is blended immediately prior to a tap or shower outlet.

I am not aware if regular flushing of water outlets did take place during this period. However, in a system as big as QEUH even regular flushing of outlets prior to occupation would probably be insufficient to control the buildup of microorganisms in various parts of the water system, and in my opinion additional measures such as continuous dosing with a biocide as soon as the water system is filled, combined with regular flushing of all the outlets would have been necessary. SHTM 04-01 (part B section 7.6) states that continuous dosing with appropriate biocides that have proven efficacy should be considered during construction to prevent the accumulation of biofilm.

SL's report also noted there was no data available on water temperatures as the hospitals computerised Building Management System had been faulty. This raised other concerns because the main microbial control measure in most hot water systems is maintaining hot water from calorifiers at >60degC and at outlets at >55degC. Failure to maintain these temperatures can allow microorganisms to survive in the water system and can even encourage their growth and development if temperatures between 20 and 45degC persist.

I had no immediate concerns at the time that I was engaged by QEUH regarding how the contamination of the water system was being managed, at least by the people who I met at QEUH, because it was evidently an issue of high importance to the hospital and involved a large multidisciplinary group who appeared capable and met regularly to discuss the various findings and options, and who sought the advice of various external experts in the field of water quality.

I recall being impressed around the time of the first meeting with how much work had been done in identifying the extent of the contamination

and the various possible causes such as the discovery of the contaminated tap flow straighteners, and the consideration given to appropriate control measures.

I did have concerns about how the water system had been managed and operated after it had been filled during construction and if outlets had been flushed regularly up to the point where the hospital received patients. It also concerned me that biocide treatment did not appear to have been used during construction as soon as the water system had been filled, and it wasn't clear if the hot water temperatures recommended in guidance had been achieved throughout the hot water system. These and other factors mentioned when I was assisting QEUH would have contributed to the microbial contamination detected in the water system.

7. Had you at that time seen the 2015 DMA Canyon Risk Assessment report 'L8 Risk Assessment (Pre-Occupancy) NHS Greater Glasgow and Clyde South Glasgow University Hospital 29th April 2015'? **please refer to Bundle 6, Miscellaneous Documents, Document No. 29, Page 122** When did you first see this document?

A I don't recall seeing the DMA Risk Assessment report (29.04.15). The documents I saw when I was first engaged are listed in my response to Question 2

8. Who showed it to you and when? What were your immediate thoughts?

A I don't recall when I first saw the DMA Risk Assessment report (29.04.15) but I don't believe it was around the time of my first meeting at QEUH.

9. Are you aware of further DMA Reports in 2017 and 2018, **please refer to Bundle 6, Miscellaneous Documents, Document 30, Page 416.** When did you see those? Please describe your views on them (taking time to read them if not already seen).

A I don't recall seeing DMA reports 2017 / 2018 prior to this inquiry.

I was able to access the 2017 DMA report from the inquiry bundle. It is a Legionella risk assessment (LRA) which took place predominantly in September/October 2017 with follow up analysis taking place in January 2018. The LRA identified several risk areas at QEUH that could support the growth of Legionella and other waterborne microorganisms. Some of the more significant risks listed in the LRA include:

- Filtration units unable to fill other tank under fault conditions. (2015 LRA noted filtration system was bypassed during the initial occupation phase)
- Cold water tank 2B was not turning over as well as others with evidence of heat gain
- Debris in the cold water tank indicates the filtration system may not be working or is bypassed
- Debris and washers in the tank in 2015 and 2017LRA suggest they are not inspected and not cleaned/disinfected and queries competency of staff doing inspection
- Water tanks (1A and Trades water tank) valved off and creating a deadleg. Trade tank isolated for approx 3 years = deadleg with no evidence of flushing
- Expansion vessels not flushed, not insulated, not flow through
- Calorifier drains - no evidence of flushing, dirty water – increase flushing
- Calorifier return temperatures consistently below recommended 55 deg C
- Numerous dead legs on the domestic water system within plantrooms and risers
- Evidence of heat gain on the cold water system up to 30 deg C
- TMV’s - limited evidence of TMVs being serviced in high risk areas and no evidence of this in non-high risk areas
- Showers – unable to confirm service history
- Written scheme – provided by DMA in 2015 not updated. Legionella management structure and PPM program not updated.

- Authorised Person (water) – no training in the control of Legionella or other bacteria has limited knowledge of the water systems on site and the requirements of L8, HSG 274 and SHTM 04-01.

There are several significant concerns from the 2017 LRA, which would all have to be rectified within a suitable time scale as indicated in the LRA.

Particularly notable risks are:

- the AP (water) had received no training on the control of Legionella/other microorganisms,
- no service history for the showers and most TMVs were not serviced,
- evidence of significant heat gain in the cold water system,
- inadequate calorifier return temperature,
- same debris in the CWS tanks in the 2015 and 2017 LRA indicates not cleaned and not inspected properly,
- various and numerous dead legs on the hot and cold water system,
- expansion vessels not flushed

It of significant concern that the 2017 LRA report by DMA summarises with the following statement - *The information gathered highlights significant gaps in the Legionella (and potentially other bacterial) control on site both in terms of management processes and the implementation of the recommended planned preventative maintenance tasks.*

This LRA highlighted that management and processes to control risks in the potable water system, particularly planned preventative maintenance, were not in place and that parts of the water system were conducive to the development of Legionella and other microorganisms in September/October 2017 and in some cases there had been no change regarding these risks since 2015.

The LRA indicates that these risks were not being adequately addressed and they probably contributed to the widespread contamination of the potable water system that was monitored effectively for the first time in February and March 2018 following initial testing of outlets. During this initial testing 77% of 98 water samples collected from the children's haemato-oncology unit tested positive for the indicator bacterium *Cupriavidus pauculus* (T. Inkster et al. JHI 111.2021.53-64).

10. Were you shown the Intertek Reports, **please refer to Bundle 18, Volume 1 of 2, Documents 3 and 4 at pages 82 and 91 respectively; and individually in the Objective Connect file entitled " Water Technical Group Intertek Investigation into Contamination of Flow Straighteners 11 July 2018**? When were they shown to you and by whom? What were your thoughts?

A The Intertek (interim) report (ITSS-0718-0001W) dated 11.07.18 was emailed to me by Ian Powrie (IP) on 25.07.18. It provided results of laboratory analysis carried out on17 flow straighteners removed from taps in various wards around the hospital, and results of analysis on drains from hand wash basin, and analysis for biofilm in two sponges recovered from one of the hospital's cold water storage tanks. The full Intertek report, also dated 11.07.18, is more extensive and in addition to the analysis in the interim report it evaluated microbial contamination in unused flow straighteners over time. I received a copy of this report in an email from IP on 30.08.18 and it was an agenda item to be discussed at the WTG meeting the following day.

Both reports show that very large numbers of a wide range of bacteria were recovered from all flow straighteners. These were mostly common environmental organisms (heterotrophs) that would not be regarded as harmful for most people, but some of these may cause infection in severely immunocompromised patients.

The presence of large numbers of a wide variety of heterotrophic bacteria indicates that conditions in the water system were also likely to be conducive to the presence of waterborne pathogens. *Stenotrophomonas maltophilia* was detected in two flow straighteners and this is recognised as an opportunistic waterborne pathogen that has been recovered from infections in hospitalised patients.

Of the 17 flow straighteners tested, 9 showed heavy visual fouling and 12 produced a strong instant reaction for biofilm. These results indicate that the flow straighteners were heavily contaminated with bacteria and were colonised with biofilm to various extents.

The full Intertek report provided in the bundle contains the results of analysis of 25 unused flow straighteners that were fitted to taps and were tested for bacteria over time. Prior to installation in taps these flow straighteners contained only small numbers of bacteria and no biofilm was detected. The flow straighteners were tested over a period of more than a month and the results show they contained increasing numbers of a wide range of bacteria and after a month showed a 500,000 fold increase in bacteria. At this stage all flow straighteners tested positive for biofilm and over 70% were heavily positive for biofilm.

The Intertek report also analysed results of water testing (provided by QEUH) for each floor of the hospital, and this showed that an average of around 40% of the samples collected from each floor (basement to 11th floor) were positive for bacteria and 60% of samples were positive on the 5th floor. It is not clear if this section of the report is referring to Cupriavidus or general bacteria.

Further analysis showed that 12 of 16 expansion vessels were contaminated with Cupriavidus and the report noted these vessels have a high potential to contaminate the water system.

The sponges recovered from the cold water storage tank also contained biofilm but the report does not indicate if they underwent quantitative testing for bacteria. One of the two drains analysed gave a strong reaction for biofilm. Drain samples are normally colonised with biofilm.

The main findings from this Intertek report are that flow straighteners and expansion vessels in QEUH were heavily contaminated with a wide range of bacteria, and newly installed flow straighteners became heavily contaminated with bacteria and with biofilm after a month in situ. Analysis of 60 water samples taken from the cold-water storage tanks revealed 5 positive samples (8%) and 3 of these samples were positive for *Cupriavidus* spp, which indicates the organism was present at the entrance to the water system.

Intertek report (01.10.18) Bundle 18 vol 1, doc 3, p82

I don't recall previously seeing this report. It may have been discussed at a WTG soon after it was received. The report is dated 01.10.18 and after the meeting I attended on 31.08.18, as far as I can recall, the next WTG meeting I attended was eight months later on 26th April 2019 so it may have been discussed at one of the meetings held during this period to which I wasn't invited.

Analysis of flow straighteners showed they were comprised of 8 parts, 6 internal plastic parts and 2 rubber gaskets. Flow straighteners were removed from taps fitted to the water system at QEUH at various times (1 week, 1 month, 2 months, 3 months, > 3 years) and were tested for total bacteria (TVC) and biofilm. At one month in the water system TVC's had increased from 10^2c fu/straightener to 10^6 cfu/straightener, and after 3 months and 3 years in situ TVC counts exceeded the maximum of 10^8 cfu/straightener. The number of different species of bacteria detected in flow straighteners also increased with time, from 3 species at one month to 6 species after more than three years in situ.

After 3 months in situ over 50% of flow straighteners tested positive for biofilm.

These results confirm that flow straighteners fitted to taps in the water system at QEUH support increasing numbers and diversity of bacteria with time. *Cupriavidus pauculus* and *Stenotrophomonas maltophilia* were recovered from flow straighteners along with other genus of bacteria.

Intertek report (08.07.19) Bundle 18 vol 1, doc 4, p91

This report may have been discussed at the WTG meeting I attended on 19th July 2019 as Intertek reports are mentioned in the minutes of that meeting, but no detail is recorded. The minutes note that the reports possibly support the need for replacement of components in the system.

I don't recall receiving the report before the WTG meeting. Ian Powrie was my main contact at QEUH and he sent me most documents I received regarding QEUH particularly relevant documents prior to any WTG meetings I attended. As I understand IP left the employ of QEUH on 02.07.19 and as far as I can see from my email records, I received no more emails or documents from him after 28.06.19.

The Intertek report (08.07.19) comments on visual inspection and microbiological/biofilm analysis of several component parts of valves, pumps, calorifiers and expansion vessels removed from the water system at QEUH. Bacteria and biofilm were detected in all components and heavy levels of biofilm detected in some parts particularly the expansion bladder metal holding plate which was badly corroded.

The results of analysis show all the components tested, particularly from the expansion vessel, were colonised with bacteria and these

would have been contributing to the microbial contamination detected in the QEUH water system.

11. In respect of each of the above documents, were you in your view informed of them at an appropriate time during the work for which you were instructed?

A I was first engaged and attended site at QEUH on 10th May 2018. I received the interim and full Intertek reports (both dated 11.07.18) on 25.07.18 and 30.08.18 respectively. The interim report was discussed at the WTG meeting on 27.07.18, and the full report was discussed at a meeting of the WTG on 31.08.18.

Although both reports are dated 11.07.18 I presume the full report was delayed and not available for discussion until the August WTG meeting and was distributed the day before this meeting. I believe I was informed of these reports within a reasonable period of time considering the need to discuss the reports with the WTG and given the scheduling of these meetings. I don't recall receiving the Intertek reports dated 01.10.18 and 08.07.19 prior to WTG meetings that I attended but they may have been discussed at WTG meetings shortly after the dates of the reports.

I recall being impressed with the initial observation by QEUH that the flow straighteners may have been a source of microbial contamination and that the hospital engaged Intertek to carry out a full physical and microbiological analysis of the flow straighteners. This led to them being recognised as a significant source of microbial contamination in the potable water system and to a programme where they were removed from the hospital particularly from areas occupied by immunocompromised patients where they presented the biggest risk. This work was initiated before I was engaged by the hospital.

I felt it was also notable that Intertek were further engaged by QEUH to undertake similar analysis of component parts of the water system which identified they, particularly expansion vessels, were

contaminated with biofilm and would contribute to the contamination of the water system.

Addressing the Water System

12. The Inquiry is aware of your report 'An assessment of Clorious2 for the Treatment of Hot and Cold Potable Water Systems in the Queen Elizabeth University Hospital Glasgow 30 June 2018' **(A44311678 – Assessment of the suitability of Clorius2)**. Please describe what led you to produce that report.

A Ian Powrie (IP) contacted me by email on 8th June 2018 and asked if I would review the properties of Clorious2 and prepare a report for NHS GG&C whether it would be safe to adopt this product over traditional chlorine dioxide (ClO2) and if so, what were the benefits and risks associated with the use of the product. IP asked for my opinion on the preferred selection of Clorious2 or traditional ClO2. IP informed me in his email that the Water Technical Group (WTG) had agreed to use ClO2 as the preferred biocide, as opposed to copper/silver ions which had also been considered with ClO2 in a discussion paper on potable water sanitisation prepared by IP and dated 24th April 2018.

IP had been introduced to Clorious2 by Dennis Kelly who was the hospital's Authorising Engineer (water). IP had reviewed the benefits of Clorious2 and had proposed to the WTG that it was adopted due to benefits which he listed as:

- a stabilised solution,
- not prone to gassing off in the hot water system,
- low odour with higher efficacy,
- minimal impact on pipework corrosion as there is no acid used in the production of the ClO2,
- minimal chlorate levels due non reversion of the stabilised solution.

IP stated that while they were keen to accept the benefits of this product the WTG were hesitant to adopt this system without expert advice, to this end he was asked to seek my support in reviewing the properties of this product and preparing a report. I agreed to do this and reviewed all the material provided on the product and other information I accessed through literature searches. My report was completed on 30th June 2018.

13. Please describe the Chlorine Dosing strategy which you proposed, and how it was intended to work. Why did you propose this particular strategy? Was there any work required within the hospital to enable it to be carried out?

A I didn't propose a chlorine dosing strategy. The hospital had already taken the decision to use continuous dosing with chlorine dioxide (ClO2). QEUH asked me to produce a report on a new form of ClO2 which is Clorious2 and the merits of this compared to traditionally generated ClO2.

Clorious2 is a ClO2 based biocide manufactured by Brenntag who refer to it as Clorious2_care. With traditional ClO2, sodium hypochlorite or strong acid is used in the reaction with sodium chlorite to generate ClO2 on site and this is dosed directly into the water system. Clorious2 used sodium peroxydisulfate to generate ClO2 from sodium chlorite and Brenntag claim that this reaction produces a stable solution of ClO2 which needs no further activation and achieves 100% conversion of chlorite to ClO2 with negligible chlorite, chlorate and chlorine by-products.

In 2018, when I produced my report on Clorious2, to me this was a novel means of generating ClO2. I was not aware of this product or its benefits as claimed by the manufacturer, and I wasn't aware of it being used for microbial control in potable water systems in either healthcare or non-healthcare buildings. I am still not aware today of its use,

particularly in healthcare premises, other than the example cited by Brenntag of a small healthcare facility in the north of England and four hospitals in the Czech Republic. Efficacy data on Clorious2 were not provided from any of these locations.

It was reported by the manufacturer Brenntag that Clorious2 is a stable solution of ClO2 with a good shelf life (6 months), efficient conversion from precursor chemicals and little residual precursor chemical sodium chlorite or chlorate, which guidance indicates can be harmful to neonates and renal dialysis patients. Brenntag also claimed that diluted Clorious2 does not contribute to higher corrosion rates, even at higher dosages, and it apparently exhibits a lower corrosion tendency towards brass and copper, than chlorine dioxide generated by reacting strong acid with sodium chlorite.

In his email to me dated 8th June 2018, Ian Powrie reported that Clorious2 was also not prone to gassing off, and it had low odour and higher efficacy. My report commented on its efficacy in controlling test bacteria in laboratory-based studies and in my opinion it did not appear to have a higher efficacy but it did seem to be a stable solution with a good conversion rate from the reaction of precursor chemicals

I felt that consideration of the use of Clorious2 was reasonable as it was ClO2 based and QEUH had already decided to use ClO2 as the preferred biocide for continuous dosing of the potable water system. Also, it had some benefits as claimed by the manufacturer which could be advantageous in QEUH.

However, having assessed the various information available to me at that time, in my opinion it was not appropriate to choose Clorious2 over traditionally activated ClO2 which had been used extensively in healthcare premises for some time with efficacy evaluated in peer reviewed publications and was supported in current guidance (HTM 04-01, SHTM 04-01 and HSG 274. Furthermore, I didn’t feel it appropriate

to trial a relatively unknown biocide such as Clorious2, in QEUH where the water system was widely contaminated and was associated with waterborne infection in patients.

The strategy of continuous dosing with ClO2 was originally proposed by QEUH. I supported this strategy but advised that it should be preceded by shock dosing with a higher level of chlorine dioxide over a shorter contact period (hours). Shock dosing is used to effectively 'soften up' any established areas of colonisation and biofilm before continuous dosing with ClO2 at much lower levels (normally 0.5ppm) commences. Shock dosing can help improve the efficacy of continuous dosing and can produce an earlier reduction in levels of microbial contamination.

The disadvantages of shock dosing are the significant disruption it can cause in a busy hospital as tap and shower outlets must be put out of use during the disinfection process, and shock dosing can result in the sudden release of large amounts of biofilm into the water system as it detaches from colonised surfaces. This risk can be mitigated by ensuring the system is well flushed after shock dosing to remove residual biocide and detached biofilm, and POU filters can be fitted for additional protection in areas occupied by immunocompromised patients.

Shock dosing with ClO2 prior to implementing continuous dosing with ClO2 was considered by QEUH but this was ruled out as I believe it was considered to be too disruptive to the normal functioning of the hospital, and the manufacturers of the stainless steel water pipes informed the hospital that it would have a deleterious effect on the pipes. There may have also been some objection from the tap manufacturer to using high level ClO2 because of damage it may cause to tap components.

Continuous dosing with ClO2 was eventually implemented at QEUH without shock dosing with ClO2.
Regarding works required in the hospital to enable dosing with ClO2, whenever disinfection is planned, liaison with specialist departments (such as renal units and neonatal units) should take place first. I noted in my report on Clorious2 that SHTM04-01 (part B section 7.8, Note 9) states: *ClO2 and its breakdown products chlorite and chlorate can be deleterious to neonates and renal dialysis patients, and should be removed from the water supply to these units.* I confirmed this in my paper on Clorious2.

In my opinion it is preferable to have a dedicated cold water supply to these units in case the water system to the rest of the hospital requires treating with biocides such as ClO2 or hydrogen peroxide. I am not aware if a separate water supply for the renal unit was introduced at QEUH, but I understand that the Renal Association guidelines indicate that chlorite and chlorate can be removed using either granular activated carbon (GAC) or powdered activated carbon (PAC). I recall from various discussions at the WTG's I attended that appropriate risk assessments were carried out before continuous dosing with ClO2 was implemented. e.g. at the WTG meeting on 31.08.18, which I attended, the agenda included:

ClO2 Impact
Renal Dialysis/Endoscopy Impact
Clinical Equipment Impact Status
Satellite Lab Impact
Neonatal – Supply Transfer Status

Also on the agenda at this meeting was an update on the status of the purchase of the dosing equipment. This had to go through a tendering process and when the equipment was acquired considerable works were required to install it. I understand several dosing units were sourced to expedite penetration of ClO2 throughout such a large water system.

A strategy for flushing all outlets on the water system had to be produced which involved flushing all outlets at least twice daily. This was implemented to ensure satisfactory levels of ClO2 reached all peripheral parts of the system. Regular flushing of outlets is crucial for the success of a biocide treatment programme. I am not aware how rigorous the outlet flushing programme has been at QEUH but it has been discussed at some of the WTG meetings.

ClO2 dosing units require ongoing maintenance and calibration of dosing equipment and regular monitoring of ClO2 at the dosing unit and at outlets to ensure it achieves a minimum level (0.1ppm) and where appropriate does not exceed drinking water limits at outlets (0.5ppm). I understand regular monitoring of ClO2 was in place at QEUH, but I have not witnessed it.

14. How successful, in your view, has that strategy proved to be?

A I am not aware of how effective the ClO2 dosing proved to be at QEUH as I have had no contact with the hospital in almost 4 years. I attended a total of eight WTG meetings in two years and four months and I normally didn't receive minutes of the meetings to which I wasn't invited to attend, so I am not up to date on all issues at QEUH. The last WTG meeting I attended was on 18th September 2020.

The ClO2 dosing took longer to roll out than anticipated. As far as I am aware, it was originally planned to go live with continuous dosing from around the early part of November 2018. There was some slippage with this due to installation issues and I believe from the minutes of the WTG provided in the bundle ClO2 dosing started around February 2019.

From the minutes of the meeting on 26th April 2019, microbiology results were showing a significant improvement in line with expected control. Weekly manual ClO2 residual samples reports were reviewed, confirming that residual levels of ClO2 in cold water were above target

and generally between 0.2 – 0.3ppm, while ClO2 in hot water was low at 0.02 to 0.06ppm. A software upgrade to the ClO2 dosing unit was raised at this meeting to increase the overall average in hot water.

It was reported in the WTG minutes from the meeting on 22nd April 2021 that robust ClO2 results were being produced and the minutes implied excellent water quality.

The efficacy of continuous dosing of a potable water system with a biocide such as ClO2 is particularly dependant on regular use of the outlets to draw biocide into all peripheral parts of the system. If this is not sustained it can impact on the effectiveness of this control measure. For this purpose, a protocol for flushing all taps and showers was produced by Ian Powrie which required all outlets to be flushed twice daily for one minute. The contractor DMT was engaged to assist cleaners with this process (WTG minutes 26.04.19). I am not aware how well flushing was implemented at QEUH.

The efficacy of any biocide treatment is also affected by how well the water system is being maintained through planned preventative maintenance. For example, it is necessary to ensure that TMV's and associated strainers and shower heads and hoses are regularly cleaned and disinfected, and that expansion vessels and calorifier drains are regularly purged to reduce conditions that can impede the effectiveness of biocide treatment and support microbial growth.

It is also important to ensure that hot water consistently flows through all parts of the distribution pipework, that there is no excessive heat gain in the cold water system or heat loss from the hot water system. Ensuring that maintenance of the system takes place in accordance with guidance (e.g. SHTM 04-01) will enable biocide treatment to be more effective. In my experience, long term use of POU filters can also reduce the effectiveness of biocide treatment in peripheral parts of water systems.

Continuous dosing of a biocide requires regular attention and the dosing equipment needs to be frequently checked, maintained and calibrated. It is noted in the WTG minutes of 20.09.18 that there are no guarantees that any biocide dosing system will be effective in eradicating bacteria from all aspects of a water system, but it has been shown in trials that ClO2 can be an effective control measure for microorganisms in potable water. In my experience it is an effective biocide and as far as I am aware it is the biocide most widely used for treating potable water in healthcare premises.

It is worthy of note that the movement in healthcare premises towards single bedrooms each with separate en-suite facilities, as occurs in QEUH, increases the complexity of water systems and the opportunity for more tap and shower outlets to become underused, which increases the opportunity for them to be colonised with waterborne microorganisms and can affect the efficacy of biocide treatment. The risk of transmission of microorganisms from even reasonably managed water systems in healthcare premises is now becoming increasingly recognised and has induced some augmented care units to become waterless. Where this has been implemented there are reports of an associated reduction in the incidence of nosocomial infection.

15. The Inquiry is also aware of your report 'Manual v Automatic flushing of Taps' **(A44312301 – Manual vs Automatic – July 2018)**. Please describe what led you to produce that report.

A On behalf of the Water Technical Group (WTG) Ian Powrie (IP) emailed me on 27th June 2018 to seek my advice on flushing requirements to maintain chlorine dioxide levels at all outlets with respect to the proposed continuous water treatment process. Regular flushing of outlets on a potable water system is crucial for the success of a continuous dosing programme with a biocide. IP asked if I would provide a written assessment of the pro's & cons of automated sensor tap flushing against a manual flushing programme.

IP said that the current manual flushing programme used in the hospital was based on the guidance where domestic staff flush showers and taps as part of their daily cleaning regime and record this activity by exception. I produced the report on 1st July 2018, and it was circulated to the WTG. IP was responsible for ensuring cleaning staff and contractors recruited to assist with the flushing were aware of the flushing protocol. This was discussed at a few WTG meetings

I am not aware what training staff received regarding flushing of outlets, but I emphasised the need for such training in my report and the need to keep records on when flushing took place

Concluding

16. You are included among the authors of a paper published in the Journal of Hospital Infections 11 (2021) 53-64 entitled "*Investigation and control of an outbreak due to contaminated hospital water system, identified following a rare case of Cupriavidus pauculus bacteraemia*". **Please refer to – Inkster T, Peters C, Wafer T, Holloway D and Makin T – "Investigation and control of an outbreak due to a contaminated hospital water system, identified following a rare case of Cupriavidus pauculus bacteraemia" Journal of Hospital Infection 111 (2021) - Bundle 6, Document 41, Page 1236)** Does this paper set out your opinion and does it remain your opinion?

A Dr Theresa Inkster is the lead author of this paper, and for my part I can't claim making any significant contribution to it apart from some proof reading, and corrections of a few misspelt names of microorganisms. As I didn't play any real part in shaping the paper I felt I should have perhaps just been mentioned in acknowledgements, but Dr Inkster very kindly and unexpectedly included me amongst the list of authors. I proposed very few amendments to the paper and thought it was an excellent document that provided invaluable information which could help prevent similar situations occurring in other healthcare premises.

At the time the paper was completed (23.12.20) I was no longer engaged at QEUH, and I was unaware of some of the information included in the paper e.g. the commissioning data from before the hospital opened, and that taps were pressure tested at the factory.

The paper does largely reflect my opinion regarding the likely cause of the contamination of the water system at QEUH and appropriate control measures. However, given my experience of water systems in healthcare premises I do not entirely concur with the statement that as a new-build hospital it was unexpected to find well-established biofilm and systemic contamination in a building which had been open for less than three years, but I can understand why this was the view of Dr Inkster and others at QEUH.

My expertise is predominantly required by healthcare premises that have problems with their water systems, which is why QEUH engaged me, and so in my rather more directed experience of new hospitals it's not unusual for me to encounter contaminated water systems, or for biocide treatment to be considered shortly after the opening of a new or refurbished hospital.

In my experience, most problems with contaminated water systems in new buildings arise during the construction of the building and before handover to the users. Dr Susanne Lee stated in her report (25.04.18): *In new buildings in particular the highest risk time for contamination is during the build and installation and commissioning.*
This is because the conditions that support contamination of the new water system are often created during construction e.g.:

- dead legs in the water distribution system,
- inappropriate use of materials to seal pipe joints,
- the presence of EPDM flexible hoses,

- inadequate balancing and distribution of hot water,
- hollow supports in cold water tanks,
- inadequate insulation of pipework,
- proximity of heat sources to cold water systems,
- oversized cold water storage tanks,
- outlets not flushed regularly after the water system is filled
- inadequate disinfection of the water system prior to handover.

In my experience, various combinations of these and other factors commonly occur in new healthcare buildings despite there being extensive information available on these matters in guidance and standards.

When water is first introduced into a potable water system to check for leaks etc prior to occupation of the building, inadequate flushing of the water system and delays in the normal operation of the water system can lead to stagnation or reduced flow which can support the accretion and development of biofilm comprising a wide range of waterborne microorganisms in various parts of the system.

Regular flushing around the whole site is required during this critical phase in new builds and in my experience this is frequently not carried out correctly or recorded. SHTM 04-01, part A (Design, installation, testing) which applies to healthcare premises under construction, recommends flushing hot and cold outlets every 3 days for one minute. SHTM 04-01 part B, (operational management) recommends sporadically used outlets should be flushed at least twice weekly. This guidance is predominantly based on the control of Legionella in water systems. Legionella is a relatively slow growing bacterium. Other waterborne bacteria can multiply faster so more frequent flushing of outlets would be necessary to help prevent these bacteria from colonising a water system.

Dr Susanne Lee noted in her report dated 25th April 2018 that there was at least 12 months delay between filling the water system at QEUH and occupation of the building. Water systems should be filled with water as close to occupation as possible. They should be disinfected just prior to handover, flushed and kept flowing as if in full operational use to avoid stagnation. In my opinion, too much reliance is put on the final disinfection of the water system to control bacterial contamination that may have accumulated after the water system has been filled. If biofilm has been allowed to become established during this period e.g. because regular flushing wasn't implemented, then this final disinfection prior to handover will not be fully effective.

I am not aware if regular flushing occurred at all outlets during this period at QEUH, but in my experience it is unlikely for it to be done correctly. It is doubtful however that flushing alone would be sufficient to control contamination of the water system in such a large building as QEUH. Water systems should be filled with water as late in the build as possible. They should be disinfected, flushed and kept flowing as if in full operational use to avoid stagnation.

Continuous dosing with an effective biocide in conjunction with regular flushing of outlets would have been appropriate at QEUH throughout the period that the system was filled with water and prior to occupation of the building. During this period, when patients are not present, biocide levels can be increased, providing that the higher levels of biocide are not damaging to the fabric of the water system. SHTM 04-01 (part B section 7.6) states that continuous dosing with appropriate biocides that have proven efficacy should be considered during construction to prevent the accumulation of biofilm.

Dr Inkster's paper advises that in hospitals housing high-risk areas, such as haemato-oncology units, consideration should be given to additional precautions for these high-risk groups and amongst other measures lists the application of long-term point of use filters.

I have some concern with this view and recall commenting on this at a QEUH WTG meeting. POU filters provide effective and immediate control for transmission of waterborne bacteria, and at QEUH they appeared to be installed rapidly after recognition of the contaminated water system as a source of infection. They are an important control measure while engineering works and other remedial measures are put in place such as biocide treatment.

However, while POU filters are very effective at protecting patients from exposure to a contaminated water system, their long-term use should be avoided where possible, as noted in guidance, as they can exacerbate further microbial colonisation of the water system and this may cause issues for other areas of the hospital where POU filters are not fitted. POU filters can also sometimes contribute to contamination of outlets as fitted filters can reduce the gap between the tap outlet and the drain in the hand wash basin leading to biofilm disruption and likely aerosolisation from biofilm commonly present in drains. This point was highlighted in Dr Inkster's paper.

I especially agree with the recommendation in the paper that Infection control teams (ICT) should play an active role in Water Safety Groups (WSG) and be involved in the planning, and commissioning of hospital water systems from the outset. I don't see this happening in many healthcare premises. However, I would add that ICT need to be well supported by the WSG, particularly the Responsible Person (water) and the Authorising Engineer (water) who should have a more in-depth knowledge of the design and operation of water systems and how to reduce their contamination with microorganisms.

17. What, in your opinion, is the cause or origin of the issues or problems with the water system at the QEUH/RHC that led to your being asked to provide your help and assistance in 2018?

A In my experience of water systems in large healthcare premises contamination normally occurs during the building phase from shortly after the system has been filled with water. Small numbers of microorganisms already in fitted pipework (particularly uncapped pipes), and in water storage vessels, taps/showers etc will be supported when the system is filled with water.

Mains water supplies are not sterile and the number of microorganisms present in this water often show seasonal variation with larger numbers detected in warmer summer months. Mains water is treated with a biocide (usually chlorine or monochloramine), so the number of microorganisms entering buildings in mains water should normally be small.

In QEUH this water is passed through filters (0.5 micron according to DMA 2015 LRA, and 0.2 micron according to Dr Walker expert report 21.12.24) before entering potable water bulk storage tanks. Both filters would remove particulate matter, 0.5 micron would remove most bacteria and 0.2 micron would remove all bacteria.

It was noted during the April 2015 Legionella Risk assessment (LRA) that the filters were being bypassed during the LRA and unfiltered water was allowed to enter the system. This took place during the period after handover (26.01.15), and prior to occupation of the building by patients, which I understand commenced from 24.04.15 for the main building and from 10.06.15 for the children's hospital. The bypass of the filters appears to have taken place when QEUH was operating the building rather than during the construction phase.

Taps installed throughout the building were fitted with flow straighteners and these became contaminated with a range of waterborne bacteria after installation or were contaminated prior to installation as shown by analysis carried out by Intertek (11.07.18), or both of these events occurred. Some of these bacteria were similar to

types recovered from infected patients. Unused flow straighteners contained small numbers of bacteria on receipt from the manufacturer and when they were installed in taps fitted to the water system analysis by Intertek established the presence of biofilm and large numbers of bacteria after just one month in situ.

It was reported in Dr Inkster's paper that the taps were pressure tested in a factory before they were delivered to the hospital. Pressure testing normally uses water and if this becomes contaminated it can result in bacterial contamination of the internal parts of the tap which may persist up to installation. I have personally encountered this problem with another tap manufacturer where contaminated water in a pressure testing facility left bacteria inside the taps.

In my opinion the water system was probably contaminated with bacteria from when water first entered the system during the construction phase and prior to the hospital being occupied, and this contamination originated from contaminated taps/flow straighteners, contaminated pipework or other fittings such as expansion vessels, and ingress of bacteria present in the mains water supply particularly when the filtration system was bypassed. Once bacteria gained access to the water system at QEUH conditions must have been conducive to their development in various parts of the system as testing showed they were widespread, particularly at tap outlets, and there were many different types of bacteria detected.

Dr Lee noted in her report that the water system was filled with water for over 12 months before occupation of the building. If the outlets were not regularly flushed prior to occupation this would effectively produce stagnant water conditions particularly in the cold water system. Stagnant or low flowing cold water is susceptible to heat gain and concomitant microbial growth and it has no shearing force to help remove biofilm. Lack of flushing also supports the accretion and development of microorganisms at tap and shower outlets.

In my opinion, in addition to regular flushing of outlets, a water system as large as QEUH would require continuous dosing with an effective biocide until the building was occupied. SHTM 04-01 supports both continuous dosing with a biocide and regular flushing of outlets during construction. If these control measures were not in place from when the water system was first filled, and there are some indications that they were not, then I believe this is the period when widespread microbial contamination became established in the water system at QEUH.

Contamination of the hot and cold water system would be further exacerbated by the other deficient factors identified in the Legionella risk assessments (LRA) carried out by DMA Canyon in 2015 and 2017 and referred to in Provisional Position paper 11 in the inquiry bundle. Some of the more significant risk factors that were identified and were likely to exacerbate contamination within the water system at QEUH are:

- the hot water system was not achieving recommended temperatures as indicated in the 2015 LRA.
- Heat gain in the cold water system and inadequate operation and cleaning of storage tanks
- the installation of expansion vessels that were not recommended for hospital water systems and which contained stagnant water and were colonised with bacteria.
- Numerous dead leg sections of pipe and non-operational calorifier and cold water storage tanks acting as a dead leg
- No servicing history for showers and many TMVs

Once bacteria and associated biofilm became established in the water system this would prove very difficult to control and would justify the use of various control measures including continuous dosing with chlorine dioxide, regular flushing of outlets to encourage the distribution of the biocide to all parts of the system, and the fitting of point of use filters to

protect more susceptible patients while these control measures and other remedial works were being implemented.

18. Do you have any additional comments to make regarding these matters, or any other matters that you consider to be of significance?

A ***No standards or guidance*** - I believe it is of relevance that there are no standards or guidance on the control of bacteria being detected in the water system at QEUH such as *Cupriavidus* spp, *Stenotrophomonas* spp and other waterborne opportunistic pathogens. I am not aware of any benchmarks for permitted levels of these bacteria in water systems, as there are for Legionella bacteria and *Pseudomonas aeruginosa*.

Background environmental bacteria are present in many water systems but have only relatively recently been able to be routinely identified with improved laboratory techniques. They are generally regarded as not harmful to health, but it is becoming increasingly evident that some can cause infection in particularly vulnerable patients e.g. those receiving augmented care and notably patients with immune systems that are compromised due to immuno-suppressive therapies.

As far as I am aware, there wasn't a requirement in the Scottish HTM 04-01 (2014) to test water samples routinely for the presence of *Pseudomonas aeruginosa* in augmented care facilities as occurs in HTM 04-01 which applies in England. This requires routine six monthly testing of all relevant water outlets in all augmented care units in healthcare premises. SHTM 04-01 (2014) part B note 16 does not advise routine testing for *P. aeruginosa* and only requires testing of water in certain circumstances such as suspected or confirmed outbreaks or a series of sequential cases. In my opinion, if a requirement for routine testing for *P. aeruginosa* had been in place from when the hospital opened in April 2015 it may have helped to identify the presence of widespread bacterial contamination of the water system earlier. In my opinion, routine testing

of water outlets for *P. aeruginosa* should be considered at the next review of SHTM 04-01.

Although testing for *P. aeruginosa* can assist as a marker organism in revealing general bacterial contamination in water systems, it is a selective procedure focussed on the detection of *P. aeruginosa* and not designed to identify the presence a wide range of other waterborne bacteria. A large proportion of background bacteria in water systems are detected during conventional testing for total heterotrophic bacteria (TVC). In addition to routine *P. aeruginosa* testing in augmented care facilities I believe consideration should be given to including TVC testing which is a simple test that can help indicate if conditions in the water system are generally conducive to the presence of waterborne bacteria including opportunistic pathogens.

Water quality regulations require water delivered to consumers taps to be wholesome. This is based on compliance with Prescribed values and Indicator parameters which from a microbiological perspective effectively means the absence of *E. coli*, Enterococci and coliform bacteria (Prescribed values). TVC testing is included in Indicator parameters but there are no numerical values set for TVCs. The regulations state that TVC's at consumers taps should show no abnormal change.

This criterion based on trend analysis could be adopted if TVC testing is undertaken routinely in augmented care units to detect underlying bacterial contamination. Where TVCs increase on previous results of analysis, or on levels in incoming mains water supplies, then this should initiate further investigation that could lead to the identification of opportunistic pathogens such as *Cupriavidus pauculus*, *Stenotrophomonas maltophilia* and others. The BSI standards publication PD 855468:2015* uses TVC results in excess of a 2 log difference above that found in incoming water as an indicator for further investigation of microbial contamination of potable water systems.

*(*PD855468:2015 Guide to the flushing and disinfection of services supplying water for domestic use within buildings and their curtilages*)**

Sewage treatment facility - I recall my first visit to the hospital and discovering that it had been built next to a sewage treatment facility. I was astonished by this, and it was the first point I raised when I met Ian Powrie, my main contact at QEUH. I asked why it had been allowed given that the hospital contained some very immunocompromised patients, and I was particularly concerned about potential transmission of microorganisms from the sewage treatment facility, as airborne transmission of microorganisms from sewage treatment works had been well documented.

I'm not aware if the impact of the proximity of QEUH to the sewage treatment works has been fully investigated e.g. if air sampling for airborne microorganisms has been carried out at appropriate times and places and if the possibility of airborne and waterborne contaminants gaining access to the water system at QEUH has been properly considered.

Continuous dosing with a biocide - It is regrettable that biocide dosing equipment for treatment of the water system at QEUH was not installed earlier than it was. As far as I am aware, continuous dosing with chlorine dioxide (ClO2) was being discussed at the hospital from early in 2018 and the hospital appeared to be already in favour of continuous dosing with ClO2 before or shortly after I was engaged on 10th May 2018. I advised the hospital on continuous dosing with ClO2, and on an alternative ClO2 dosing unit (Clorious2).

As far as I am aware from information provided in the inquiry bundle, the ClO2 dosing units became operational around November 2018 with reasonable levels of ClO2 at outlets not being achieved until 2019. I am not aware if this water treatment system could have been implemented any sooner, but the water system at QEUH is very large and complex

and the hospital was fully operational, all of which would influence when the ClO2 dosing system was eventually installed.

In my opinion if shock dosing with an effective biocide had been carried out in accordance with the appropriate standard just prior to occupation of the building, and if continuous dosing of the water system with ClO2 had been installed during construction and activated as soon as water entered the system along with regular flushing of all outlets, and if the system had been operated in accordance with guidance in SHTM 04-01 then I believe this is likely to have significantly reduced the risk of widespread contamination of the water system detected at QEUH.

Both measures i.e. continuous dosing with a biocide during construction and regular flushing of outlets are contained in SHTM 04-01 current guidance. This states: *Continuous dosing with appropriate biocides that have proven efficacy should be considered during construction to prevent the accumulation of biofilm. A regular flushing programme for all outlets should also be implemented.* Further explicit guidance or standards on this matter may be needed to help mitigate similar microbial contamination of potable water systems in the future.

Declaration

19. I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

20. The witness was referred to specific documents in the following bundles associated with the questions asked within their questionnaire. (Appendix A)

21. The witness verbally / physically introduced the following document/s to the Scottish Hospital Inquiry for reference when they completed their questionnaire statement (Appendix B)

Appendix A

A43293438 – Bundle 6 – Miscellaneous Documents
A47395429 – Bundle 10 – Water Technical Group/Water Review Group Minutes
A48235836 – Bundle 18 – Documents referred to in the export report of Dr J.T. Walker
A44312301 – Manual vs automatic flushing of Taps – Tom Makin
A44311678 - An assessment of the suitability of Clorious2 for the treatment of hot and cold potable water systems in Queen Elizabeth University Hospital, Glasgow – Tom Makin
A42303223 - Water Technical Group Intertek Investigation into Contamination of Flow Straighteners - 11 July 2018

Appendix B

A38271789 – Draft meeting report - 25/4/2018 - NHS Greater Glasgow & Clyde
A49541924 – Extract – American Journal of Infection Control – 4th Decennial International Conference on Nosocomial and Healthcare – Hood et al – Page 86
A49542934 – Dr T Makin – Screen Shot – Reference list showing publication of Hood et al (2000) American Journal of Infection Control – Issue 28 Volume 1

Scottish Hospitals Inquiry

Witness Statement of Questions and Responses

Dennis Kelly

This statement was produced by the process of sending the witness a questionnaire with an introduction followed by a series of questions and spaces for answers. The introduction, questions and answers are produced within the statement.

Personal Details

1. Name, qualifications, chronological professional history, specialism etc – please provide an up-to-date CV to assist with answering this question.

A Dennis Kelly. BSc (Hons) FIHEEM, FWMS, C Biol, MRSB. I am a Chartered Biologist and a member of the Royal Society of Biology as well as a Fellow of the Institute of Healthcare Engineering and Estate Management and a Fellow of the Water Management Society.

Professional Background

2. Professional roles within academia

A None within academia

3. What role did you have before becoming Authorising Engineer for the NHS?

A I work for Pro Lp Consulting Ltd and am contracted to the NHS as an Authorising Engineer. Prior to this I had various management, senior management and technical support roles with various water treatment companies spanning over 40 years. Immediately prior to essentially working for myself in Pro Lp Consulting Ltd, I was the European Business manager for water Hygiene in Nalco Ltd.

4. When were you appointed Authorising Engineer by the NHS?

A I can't remember the exact date but I believe it has been in excess of 10 years since I was appointed for a Board in NHS Scotland. Looking at my records I have had involvement with NHS GGC since around 2014. At that time I was working as an external technical consultant for Legionella Control International Ltd (LCI). I believe that LCI held a contract with NHS GGC for the supply of AE(Water) services

5. What hospitals did you work in as Authorising Engineer?

A I have worked in multiple hospitals in various NHS Boards across Scotland. My files show that I worked initially in NHS Lanarkshire in 2013 in various hospitals in that Board including Monklands. At around the same time I worked for NHS Tayside in Ninewells, Perth Royal Infirmary, Stracathro and many other hospitals and health centres.

6. What were your responsibilities in this role?

A As an outside contractor, and not a direct NHS employee, I would respond to requests to complete work of different sorts in various hospitals. Some of this work would be for technical support. I would also, when asked, complete AE compliance audits, authorised person competency checks and where requested deliver water related training]

7. If had more than one role, what was the work split with different hospitals?

A I delivered various roles to various hospitals depending on what I was asked to do.

8. How many hours per week did you spend in your role at QEUH/RHC?

A I do not recall. I would work in response to request and that might be for 1 hr on a technical issue up to two or three days at times.

9. Who did you report to?

A I would generally report to an Estates Manager or senior estates manager

10. Who reported to you?

A Nobody

11. Describe an average working day in your Authorising Engineer role.

A There is no average day. It would depend on what I was requested to do. It could be any or all of the roles mentioned in the answer to question 6 which would include technical support and advice, training and auditing.

12. Who did you work with most closely at the QEUH/RHC?

A Over the years I have worked with various people and this has been subject to change over time. I would work with hospital estates managers and who this was would depend on the hospital I was working in.

13. What training, if any, did you provide to staff at QEUH/RHC?

A None – I was not requested at the time of the QEUH opening, or prior to or after that, to deliver any training to QEUH/RHC staff, or any staff in NHS GGC.

14. What is your specific expertise?

A I have a biological degree and 48 years' experience of working in the water treatment and water hygiene fields. I believe I have an expertise in the operation of building hot and cold water systems, with a particular regard to microbiological activity in these water systems.

15. What experience, if any, do you have of large scale infection outbreaks?

A I have supported end users and clients in Legionella outbreaks in Glasgow, Hereford and Edinburgh amongst others. I have supported when there have been issues with regard to the Pseudomonas organism. I respond, when asked, to requests for support from the NHS sites.

16. What reports, if any, did you prepare for GGC relating to the QEUH/RHC?

A None until I was asked to complete a compliance audit. Until that point I was not asked for any advice in relation to the QEUH/RHC and I stated this fact in

my Dec 2016 annual report. I also recommended in this report that a compliance audit should be undertaken for the QEUH/RHC hospitals **(DMA Water: Written Scheme for Legionella Control QEUH & RHC: December 2016 Update – Bundle 18, Volume 2)**

17. What advice did you provide to GGC relating to the QEUH/RHC?

A I recommended in the December 2016 annual report that a water compliance audit be undertaken on the QEUH/RHC as I was concerned that the hospital had been operating for some time without an audit having been completed.]

18. What, if any, specific water borne infection concerns were raised with you by GGC relating to the QEUH/RHC?

A None. The annual compliance report looks at the management of the hospital water systems and I raised issues within that report.]

19. If so, when were these concerns raised with you?

A Concerns were not raised with me until after patient infections had occurred but I cannot recall the dates.]

20. If so, who raised these concerns with you?

A I can't remember specifically but I did have contact from Alan Gallagher and Mary-Anne Kane.

21. How did they inform you of their concerns? email? Phone? Face to face?

A Email and telephone

22. What group were you invited to join at the QEUH/RHC?

A The Water Technical Group

23. Why were you invited to join this group?

A I assume because I was an authorising engineer for water and could perhaps assist in the situation given my background and experience.

24. What was the purpose of the group?

A As I understood it the purpose of the group was to look at how the QEUH/RHC water systems were being operated.

25. Who else was a member of the group?

A When I was first involved, and looking at notes from these meetings, the following people were involved. Ian Powrie, Ian Storrar, Iain Kennedy, Annette Rankin, Colin Purdon, John Hood, Teresa Inkster, John Mallon, Tom Steele, Alan Gallagher, Mary Anne Kane, Karen Connelly, James Cumming, Andrew Wilson and other external support people such as Tom Makin and Tim Wafer.

26. Why did Tom Makin join the Water Technical Group in or around April 2018?

A I am unable to answer this question. This is a question for the people that invited him on to the group.

27. Who was your Authorising Engineer predecessor at QEUH/RHC?

A I do not know. I am not sure there was an authorising engineer for water prior to my involvement.

28. What involvement, if any, did you have in the design and build of the water system at QEUH/RHC?

A None

29. What are the important guidance documents relating to the water system in a hospital?

A The HSE ACoP L8 document. The HSE HSG 274 document, The SHTM 04-01 documents, HBN 00-01 **(ACOP L8 3rd Edition) (Legionnaires Disease – HSG274 Part 2 – The control of legionella bacteria in hot and cold water systems – Bundle 15) (SHTM-04-01 – Bundle 18, Volume 1) (397 HBN 00-01 Oct 2014)**

30. What is the commissioning and validation process for the water system of a hospital?

A I am not a commissioning engineer. However, I do know that it involves balancing water systems, disinfection of water systems, ensuring temperatures are correct throughout the water systems and microbiological sampling. There may be other things involved of which I am unaware.]

31. What specific actions would you have expected to have been undertaken relating to the water system before and after handover?

A I would have expected the receiving NHS Board would have a complete understanding of how to operate the water systems. The Board staff should also have been satisfied that the water systems were operating correctly. They should have been satisfied that suitable and sufficient and successful disinfection of the hospital water systems had been completed. During the build phase appropriate measures should have been in place to ensure that microbiological opportunity was kept to a minimum. This should have been overseen by the NHS during the build phase. A risk assessment should have been completed and suitable risk reduction processes and procedures should have been in place at handover.

32. What inspections were carried out in relation to the water system of the QEUH/RHC?

A I assume that this question refers to the time of handover and the opening of the hospital. I do not know what inspections were carried out as I had no involvement at this time.

33. What plans were prepared in relation to the water system of the QEUH/RHC?

A I do not know. I had no involvement.

34. What was contained within the plans relating to the water system of the QEUH/RHC?

A I do not know. I had no involvement.

35. What policy documents did you prepare in relation to the water system of the QEUH/RHC?

A None

36. Who is responsible in GGC for ensuring there is a plan/policy in place at the QEUH/RHC?

A I do not recall at the time of the handover. Normally it would be the nominated responsible person for water

37. Who is responsible in GGC for ensuring that the building and water system is handed over in an acceptable condition?

A At the time of the handover I had no involvement, so I do not know. As I understand it some Boards operate with a separate building project management group for new builds and hospital refurbishments.

38. What are the benefits of having an Authorising Engineer in the project team at the beginning of a project at the design stage until the end of the project?

A Authorising engineers are generally experienced in the operation of building water systems in a way that helps the building owners and operators to operate the water systems in a way which reduces microbiological opportunity in the water systems. This can be applied to new builds, during the construction phase, as well as to existing operating hospitals

39. What technical advice was sought from you by GGC during the construction and handover phases of the project?

A None

40. What recommendations did you make to GGC in relation to the water system?

A None – I was not asked for any recommendations during the build and handover phase nor for some time after the hospital was opened.

41. Who were the recommendations given to?

A I did not make any recommendations as stated above so I cannot answer this question.

42. What water audits, if any, did you undertake for GGC at the QEUH/RHC?

A I completed the first water compliance audit in May 2017. This was the first time I was asked to undertake an audit. I had recommended that an audit be done in the Dec 2016 annual report. Since that time I have been asked to complete compliance audits on a number of occasions.

43. If so, when were the water audits carried out?

A I have completed water audits in May 2017, July 2018, Jan 2020, Feb 2021,Feb 2022, Jan 2023, Jan 2024 **(QEUH 2017 Water AE Audit – Bundle 15) (QEUH 2018 Water AE Audit – Bundle 18, Volume 2) (QEUH audit 30012020 ver 1 5 – Bundle 18, Volume 2) (Doc A for NHS GGC Management QEUH RHC ver 1.1 – Bundle 18, Volume 2) (QEUH and RHC Feb 2022 Audit Doc A – Bundle 18, Volume 2) (QEUH RHC AE Audit Jan 2023 – Bundle 15)**

44. What were the outcomes of the water audits?

A An audit report was produced and within the report there will have had comments and recommendations made.

45. What does an annual audit involve?

A It involves spending time with the involved NHS employee(s) and reviewing the operational management of the hospital water systems. This would involve examining the risk assessment and the water safety plans for the hospital. Within the water safety plan there will be a review of the competency levels and the levels of task completion of the required risk reduction asks. It also looks at contractor competence and specific items like disinfection procedures.

46. What documentation does the Authorising Engineer need to see during an audit for the water system?

A The risk assessment and all the paperwork contained in the Water Safety Plan records.]

47. What documentation did you see during your audit of the QEUH/RHC's water system?

A I assume this refers to the audit that was carried out in May 2017. This was the first audit completed for the QEUH/RHC. The 2015 DMA Canyon Ltd risk assessment was available. Besides that, I cannot remember the specific detail of what documentation was available but in looking at the audit there were elements of the paperwork that were not available at the time of the audit. It is stated in the audit report that "There is no adequate written scheme, in terms of the requirements as detailed in the HSG 274 document, for the QEUH currently available on site."]

48. What, if any, issues did you identify during your audit?

A As stated in the answer to question 47 above there was no adequate written scheme available. There were also gaps in the records of task completion. I would refer you to the May 2017 audit document which details what was there and what was not there from a documentation point of view.

49. What concerns if any arose as a result of identifying these issues during the audit?

A There were concerns about the lack of training for the involved staff, the need for an up to date risk assessment and the gaps in the records which suggested that not all the required tasks were being completed. I have copied the last paragraph from the executive summary part of the audit document "In summary, there is currently a delivery of many of the perceived required processes and procedures. However, it needs to be reviewed in order to meet the required compliance standards, and to ensure that a reduced level of risk is maintained. The delivery of the processes should be based on a new risk assessment. This will help to define the actual current requirements which will

be defined by the risk assessment. There is also a need to clarify the management structure, and also to ensure that all involved personnel, from both NHS GGC and also contractors staff are trained and have an adequate level of competency in order to deliver the required level of water based risk reduction in the QEUH."]

50. What was your reaction when you were asked to join the Water Technical Group?

A I wanted to help if I could.

51. How was your workload at the time of the invite? Did you have capacity to also spend time in the Water Technical Group?

A My workload is generally pretty committed but I did have time to help with the Water Technical Group.]

52. How much experience do you have of dealing with the waterborne pathogen, Cupriavidus?

A None. I was asked about Cupriavidus at the time that it was found in the water system. I called some colleagues and friends in the industry and in other hospitals and asked them if they had any experience of Cupriavidus and the answer from all was no. It was not an organism that had ever been mentioned to me in my many years in the water hygiene business area.

53. What input did you provide to the Water Technical Group?

A I joined in all the meetings for which I was available and when asked offered suggestions on such topics as sampling, disinfection procedures and other technical points. I responded where I could to any questions from the NHS GGC staff.

54. How often did the Water Technical Group meet?

A My records indicate that the Water Technical Group was meeting at least once per month and often twice or more.

55. Who, if anyone, was in the Water Technical Group from Infection Control?

A I remember Teresa Inkster attended the meetings. John Hood was also a member of the group in the earlier meetings.

56. What is Clorious 2?

A Clorious 2 was a stabilised chlorine dioxide product. I had heard about from the manufacturer at about the time I was asked to join the Water Technical Group.

57. What, if anything, did you say in the Water Technical Group about Clorious 2?

A I had been contacted by the manufacturer of Clorious 2 and supplied with some information on the product. Other than this contact from the manufacturer I had no experience in using the product. I said it might be worthwhile considering the option of using it a continual dose disinfectant and that it might be worth getting more information on the product. I was not advocating the use of the product and had no previous experience of the product. I considered it might be an option that could be looked at.]

58. What was Tom Makin's view on Clorious 2?

A I don't know

59. Why did you have a difference of opinion on the use of Clorious 2?

A I have no recollection of a difference of opinion with anyone. I raised the possibility of using a product that might help but stated that more information would be needed. I had recently heard about the product from the manufacturer and it was nothing more than that.

60. What was your involvement in the chloride dioxide dosing programme?

A None other than discussing the use of chlorine dioxide in general as a secondary disinfectant.

61. Who provided advice on the chloride dioxide dosing programme?

A I understand that Tim Wafer is a chlorine dioxide expert and he was on the Water Technical Group.]

62. To what extent is it accurate to say that there was no proper management system in place for the water system at the QEUH/RHC during the design, build and post-handover stages?

A I cannot comment on the management during the design and build stages as I had no involvement at that time. My first involvement was in May 2017 with the first annual compliance audit and I can only comment from that point on.

63. To what extent, if any, were you involved in any water sampling at the QEUH/RHC?

A I had no involvement. Sampling was undertaken by a contractor.

64. If so, when did you carry out the water sampling?

A I did not undertake any water sampling.

65. What were the results of the water sampling?

A I cannot recall the exact results of the water sampling.

66. What is the risk assessment process carried out by the Authorising Engineer for the water system?

A The authorising engineer does not complete risk assessments. A risk assessment would be completed by a suitably qualified risk assessment supplier.

67. Would you recommend the use of flexi-hose in a hospital? If not, why not?

A I would not recommend the use of flexible hoses in healthcare buildings. Flexible hoses are understood to offer increased levels of microbiological growth opportunity and for that reason I would not advocate that they are used.

68. What is meant by “dead legs” in the context of a water system?

A The term dead leg, or dead end, is typically used to describe a run of pipework that is no longer in use or a pipe that has become isolated from the regular flow of water.

69. How many dead legs, if any, did the QEUH/RHC have?

A I do not know. I did note in the May 2017 compliance audit document, that the risk assessment, in section 7, had identified some dead legs. I also commented in the May 2017 audit that there was no evidence in the records that any dead legs that had been identified in the 2015 risk assessment had been removed **(QEUH 2017 Water AE Audit – Bundle 15) (Report prepared by DMA Water Treatment Ltd titled “L8 Risk Assessment (Pre-Occupancy) NHS Greater Glasgow and Clyde South Glasgow University Hospital” dated 1 May 2015 relating to site assessment concluding on 29 April 2015 – Bundle 6)**

70. What risks, if any, arise from dead legs in a water system?

A Dead legs contain stagnant water. This provides increased opportunity for biofilm development which in turn may provide increased growth opportunities for various bacteria. Additionally, temperatures in the stagnant water in the dead leg may be conducive to bacterial growth. Dead legs may also “reseed” the water system with bacteria from the deadleg.

71. What is the purpose of a water storage tank on the 12th floor of the QEUH?

A I believe it is the fire water storage tank for the helipad firefighting system.

72. What discussions, if any, do you recall about the water storage tank’s capacity in the QEUH?

A I don’t recall these discussions

73. What are the risks, if any, of having 24 hour storage capacity rather than 12 hour storage capacity?

A Increased storage capacity infers slower turnover of water in the tanks. Slower turnover of the water may be conducive to increasing microbiological growth opportunity.

74. To what extent, if any, do single en-suite rooms increase the risk of waterborne infection? If so, why?

A There are a number of things to consider with ensuite rooms. If the patient is ambulatory and is using the en suite facilities then water is likely to be utilised and water will be flowing in the pipework to the outlets in the en suite. If the patient is not ambulatory then unless arrangements are made for the water systems to be utilised in some other way, for example by water flushing, they may become little used outlets.

75. How common is it to find stenotrophomas, Cupriavidus, Enterobacter, serratia marcescens, and pseudomonas in the water system of a hospital?

A I have no data to enable me to give an specific answer. It is my understanding that these bacteria may not be looked for unless there is a clinical prompt to do so, like a patient infection with one of these organisms. So it is difficult to be definitive. I have come occasionally came across all of these named organisms in the question being reported in the water systems.

76. Did you attend the Ward 2A/2B Water Review Results Meeting on 8 February 2022 at 2pm via Microsoft Teams? If so, what was discussed? What, if any concerns, were raised during the meeting? **Refer to Bundle 18, Vol 2 of 2, Document 118.**

A I have looked at the document and I recognise some of the data. However, my diary for February 8th, 2022, shows that I was delivering training to a contractor on that day so it is unlikely that I was at the meeting. Consequently I have no knowledge as to what was discussed or what concerns were raised during that meeting.

77. What input, if any, did you have in the Health Protection Scotland report on the QEUH/RHC water contamination incident and recommendations for NHS Scotland? **Refer to Bundle 19, Document 174.**

A None. I note on page 214 of bundle 19 that it states that “NHS GGC has noted that “initial AE audit was postponed by the AE due to site commissioning, migration and site establishment.” This is not true.

78. What advice, if any, relating to the QEUH/RHC water system was sought from you in March 2018 by GGC?

A None that I can recall.]

79. What is meant by “shock dosing”?

A Shock dosing is the use of a disinfectant chemical dosed at an appropriate level to a water system for normally one to two hours, then flushed out of the system. The dose level is usually high enough to effect a kill on the bacterial organisms in the water system.]

80. What is the difference between “continual dosing” and “shock dosing”?

A Continual dosing is the use of a low-level continual background dose of disinfectant chemical. The chemical would normally be applied to the system via an automatic dosing system on a continual basis. Shock dosing of a disinfectant chemical describes the use of a higher dose rate of disinfectant which is dosed for a short period of time, often one or two hours, then flushed from the water system.

81. Why were taps not replaced in September 2018?

A I don’t recall

82. What did the bio film mapping results show?

A I don’t recall

83. What was discussed at the Water Review Meeting (Technical) on 20 September 2018? **Refer to Bundle 10, Document 24.**

A I don't specifically recall from memory. What is in the minutes of the meeting I assume cover what was discussed]

84. Why was it agreed at the above meeting to commence chloride dioxide dosing and replace/clean the drains?

A I cannot remember but reading the minutes from the meeting it does look like this was agreed.

85. What was discussed at the Water Review Meeting (Technical) on 20 December 2018? **Refer to Bundle 10, Document 35.**

A I do not recall from memory. I assume the minutes in the document cover what was discussed.

86. What automatic flushing devices were discussed? What, if any, literature did you review relating to these automatic flushing devices? Why did you read the literature?

A If this question is referring to automatic flushing of taps then I recall a website with information on auto flushing devices. I do not recall the name of any manufacturers. In answer to your question "why did you read the literature", I read literature on water related equipment all the time and if any equipment was being discussed as a possibility of being used, then I would read the literature to try and understand more about the equipment.

87. Why were you concerned about "knee jerk reactions" following the water testing on 13 December 2018? **Refer to Bundle 10, Document 35.**

A I don't specifically recall but as it states in the minutes I suggested "we should review the results". This is a recommendation I make in any situation regarding water borne bacteria in that we should understand the issue as fully as possible before deciding on the way forward.

88. What was discussed at the Water Review Meeting (Technical) on 8 March 2019? **Refer to Bundle 10, Document 40.**

A I do not specifically recall. I assume the minutes in the document cover what was discussed.

89. Why did you advise the removal of taps at the above meeting?

A I cannot specifically recall but I note from the minutes that the comment was made in conjunction to a comment on little used outlets. I may therefore have recommended that rather than flushing little used outlets, that the outlets be removed altogether but I cannot recall exactly why I made the comment.

90. What were Ward 2A's test results noted at the above meeting? What is the significance of this result?

A I don't know.

91. What are the disadvantages of using chloride dioxide to patients and the integrity of the QEUH/RHC's water system? Corrosion of water pipes, brass connectors, and other parts of the water system?

A Chlorine dioxide has FDA approval for use in drinking water and is often used as a continual disinfectant in building water systems in the UK and further afield. It is used in many healthcare buildings in Scotland. I have no clinical background and cannot comment on disadvantages for patients. Chlorine dioxide is an oxidising biocide and will have an effect on pipework and water system components over time. At the recommended use levels however any impact on water system components is likely to be limited .

92. What was discussed at the Water Review Meeting (Technical) on 21 June 2019? **Refer to Bundle 10, Document 44.**

A I do not recall specifically. I assume the minutes in the document cover what was discussed.

93. What are the limits the pipework can accommodate with chloride dioxide dosing? How close to the limits was the QEUH/RHC's dosing?

A The limit for dosing in the UK is 0.5 ppm total oxidants and chlorine dioxide is included in that figure and well as some other components that arise as a function of the reaction to create the chlorine dioxide. I cannot recall the actual dosing levels that were being found in the water system. I am not a chemist or a metallurgist so I am unable to comment on what the chlorine dioxide limits are for pipework and system components.

94. What was the effect of the chloride dioxide dosing on more resistant bacteria?

A I don't understand this question as I am unsure what "resistant" bacteria you are referring to.

95. Why was Plant Room 51 considered to be the worst affected area at the above meeting?

A I do not know. I do not recall this.

96. To what extent, if any, was the chloride dioxide dosing causing leaching from metals into the water system?

A I do not know. I am not a chemist nor a metallurgist. By way of correction can I state that it is not Chloride dioxide but is in fact chlorine dioxide.

97. What concerns, if any, did you have about the use of flexible piping in the QEUH/RHC's water system at the above meeting?

A I do not remember specifically what concerns I had in regard to the QEUH. However, I have concerns in general that the use of flexible connections is minimised as much as possible as it is known that flexible connections may over increased microbiological opportunity.

98. What concerns, if any, were raised at the above meeting about the level of resources to carry out additional water sampling?

A I do not recall the specific details other than what is mentioned in the minutes.

99. What is a POUF filter?

A It is a POU filter and not a POUF filter. This is a filter device fitted to a water outlet such as a tap or a shower. It filters water down to 0.2 micron and at this level of filtration is likely to prevent the escape of microbiological organisms.

100. What was discussed at the Water Technical Group Meeting on 6 December 2021? **Refer to WTG Minutes of 06.12.2021**

A I have no specific memory of what was discussed at meetings of nearly 3 years ago but from the minutes of the meeting it states that the purpose of the meeting was to discuss current Ward 2A water issues and review attached proposals and to propose and agree a robust sampling and replacement tap plan.

101. Why were POUF filters fitted to the showers and taps?

A I assume that POU filters were fitted as a safety measure to ensure that if there were any microorganisms in the water, they would not escape from the filtered outlets

102. What were the suspected causes of the high TVCs and gram negative results in Wards 2A and 2B?

A I do not recall

103. Why could the standard disinfection of 50ppm over 1 hour not be carried out?

A I do not recall.

104. What outlets had Cupriavidus?

A I do not recall.

105. What sanitisation and testing regime did you develop?

A I do not recall developing a sanitisation and testing regime.

106. Reference to Document A for GGC Management (Audit dated 4 and 5 2021) – **Bundle 18, Document 126.** Why were the problems during the January 2020 audit finding documentation and evidence that required procedures had been completed?

A The documentation that would allow the audit to be completed was not available. I do not know why the documents were not available. I would suggest that is a question for NHS GCC.

107. Why were there no records of NHS Estates staff having carried out and completed risk reduction tasks?

A I do not know. That is a question for NHS GGC.

108. What recommendations did you make to resolve this issue?

A I reviewed the 2020 audit report. I made recommendations relating to the fact that NHS GGC should make the details of the completion of risk reduction tasks available.

109. Why were there no NHS Estates method statements for cleaning and disinfection procedures?

A I do not know. This is a question for NHS GGC.

110. Reference to emails from Dr Inkster dated 27 September 2019 – To what extent were the minutes of Water Technical Group meetings incomplete? **Refer to Emails from Dr Inkster dated 27 September 2019**

A I have no recollection, noir can I offer any comment on this.

111. Reference to Water Technical Group Minutes dated 8 February 2019 - What was your involvement at this meeting? **Refer Bundle 10, Document 38.**

A To make comment and advise, if possible, as and when required. Other than that, I cannot recall any specifics for this meeting.

112. What concerns were there about the drinking water in the QEUH/RHC?

A I don’t recall having any concerns.

113. Reference to Legionella Control, Authorising Engineer (Water) Annual Report December 2016 to December 2017 – Why did you consider the Estates staff's level of understanding to be "mixed"? – **Refer to Legionella Control, Authorising Engineer (Water) Annual Report December 2016 to December 2017.**

A I referred to the Estates staff level of understanding as "mixed", as a consequence of the findings of the hospital audits. The comment in the annual report states this. It is copied here.

"The levels of understanding of the Estates staff at the various hospitals that were visited by the AE can best be described as mixed. This is the same statement that was made in last year's annual report. Many of the estates staff have attended training course in the past eighteen months. However, the level of understanding as evidenced by the answer to questions in some of the hospital audits was at times less than would be expected. There is therefore opportunity for improvement in this area".

114. Why did you consider the QEUH/RHC's risk control processes and procedures to be "mixed"?

A Because of the findings in the annual audit – if this is referring to the timescale in question 113 above of December 2016 to December 2017.

115. Why was the Authorising Engineer not invited to QEUH/RHC Water Group Meetings?

A I do not know. That is a question for NHS GGC

116. What recommendations did you make in your Annual Report (2016-2017)?

A I have copied the recommendations made here. 13 Appendix Collated Recommendations from the Annual Report. Management Structure/Water Safety Group – Recommended Actions

- Policy and Procedures – confirm the status of the review process on the policy and procedures documents.
- Confirm the circulation and application status of the Policy and Procedures documents throughout the NHSGGC Estate.

- Consider inviting the AE to the Water Management Safety Group Meetings.
- Consider inviting the AE to all, or some of water group meetings at Board and Sector level. Authorising Engineer Workload – Recommended Actions
- Agree the Authorising Engineer workload for the forthcoming 12 months. Written Schemes – Recommended Actions
- Create a HSG 274 and SHTM 04-01 compliant written scheme template and implement throughout the NHS GGC property portfolio.
- Complete a review of the written schemes at the various hospitals based on the requirements of the L8, HSG 274 and SHTM 04-01 documents.
- Once the review is complete put into place written schemes where required. Hospital Audits – Recommended Actions
- Review the use of the audits to assess whether the recommendations are being followed up and completed.
- Ensure that written schemes are in place at all NHSGGC hospitals.
- NHS GGC should decide on whether to follow a paper based or an electronic control and recording format for the operation of the water based risk reduction processes and procedures. Experience in other Boards suggests that an electronic format should be implemented. Risk Assessments – Recommended Actions
- NHS GGC might consider the use of a single supplier, after a suitable tendering process, for the provision of risk assessments to assist in providing a uniform approach to the written schemes.
- A formal decision should be made as to how often the risk assessments should be undertaken and this should be applied across the Estates portfolio of buildings. Training and Authorised Persons – Recommended Actions
- Review the number of AP appointments within NHSGGC and complete the technical competency checks and the subsequent appointments where required Legionella Sampling – Recommended Actions
- Complete the legionella sampling protocol and circulate within the Estates department for use throughout the NHSGGC property portfolio. Monthly Exception Reports – Recommended Actions
- Continue with the creation of the monthly exception reports.

- Define the list of staff who will receive the report on a monthly basis. Include the AE on that list. Training – Recommended Actions
- Any new or promoted members of staff may require training. This should be reviewed annually and training completed as appropriate.
- Complete the Authorised Persons competency checks for the two outstanding staff. Legionella Sampling – Recommended Actions
- Include more detail in the monthly exception reports when a "fail" is listed under the Legionella sampling area of the report. Pseudomonas – Recommended Actions
- Review the current status of the risk reduction processes and procedures, that fall under the remit of the Estates department, and update as necessary.
- Review the overall Pseudomonas based requirements in light of the changes to the NHS GGC property portfolio and contact Infection Control to review and update the list of areas of concern in NHS GGC.]

117. How many of the Estates staff at QEUH had been previously assessed and recommended as technically competent to be an Authorised Person?

A I don't know what timescale is being referred to. It should be noted that AP audits are completed at the request of NHS GGC. I have a record of six staff having been competency checked in August 2018 and a further two staff having been competency assessed in February 2019.

118. Reference to QEUH Legionella Inspection L8 Requirements – What communication issues were highlighted in the document?

A I don't know.

119. Reference to Legionella Control Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems dated 23 July 2018 – What are the key concerns highlighted in your audit report? **Refer to Bundle 18, Document 112.**

A Any concerns that I had are covered in the recommendations in the report. Looking again at the report my key concerns were when would NHS GGC review or redo the risk assessment process. There was also a concern that

the documents provided at the time of the audit were not complete. There were concerns about the completion of some of the risk reduction tasks. Flushing of little used outlets was also a key concern. There were other concerns.

120. Reference to QEUH/RHC Potable Water System: Proposed Sanitisation Strategy Paper dated 5 June 2018 – What is the most effective treatment for established biofilm? **Refer to QEUH/RHC Potable Water System: Proposed Sanitisation Strategy Paper dated 5 June 2018.**

A There are varying views on the best biocide for biofilm but Chlorine dioxide is generally held in the water hygiene industry as performing well against biofilm.

121. What solution did you recommend to Ian Powrie in relation to dosing of the pipework?

A I do not recall offering any solutions. I may have offered some possible options.

122. Why was Clorious 2 Care recommended over traditional ClO2 production methods?

A I do not recall it being “recommended” over traditional ClO2 production methods. It may have been offered as something that could be considered as a possible option for delivering chlorine dioxide to the water system.

123. How was the general attendance at Water Technical Group Meetings?

A In my opinion it was good.

124. How was your own attendance record at Water Technical Group Meetings?

A I don’t recall but I believe I attended most of the meetings.

125. Reference to Dr Inkster email dated 5 July 2019 – To what extent is Dr Inkster's email statement accurate that atypical mycobacteria infection is not common? **Refer to email chain – Dr Inkster to colleagues regarding Chlorine Dioxide dosing of the water system – 01 July to 05 July 2019**

A I do not know.

126. To what extent is Dr Inkster's email statement accurate that lower dose chlorine dioxide was possibly allowing mycobacteria to flourish?

A I have not had any experience of this issue elsewhere so am unable to meaningfully comment. In the literature however it is possible to find papers that suggest that Mycobacteria are more difficult to kill.

127. When did you first become aware of the DMA Canyon L8 Pre-Occupancy Water Risk Assessment of the QEUH?

A I cannot recall when I first became aware of this report. It is likely however that I would have first become aware of this report when I undertook the first AE compliance audit.

128. What issues were highlighted in the DMA Canyon Risk Assessment?

A There were a number of issues raised in the risk assessment of 2015 including hot water temperatures at some of the calorifiers, creation of dead legs at flushing points, recommendation that background dosing should be used, recommendation for backflow prevention checks, recommendation for flushing and additional measures amongst other things. Some storage tanks and calorifiers were stated to be "high risk". It was also stated that there was a lack of a management structure which was a concern. Concerns were raised about water temperatures in both hot and cold

129. What concerns, if any, did you have after reading the DMA Canyon Risk Assessment?

A Having read the audit report I had a concern that there was no evidence that the remedial actions in the risk were being addressed. I was concerned that

despite the fact that this was a new build hospital, there was no apparent water safety plan available at the time of the audit.

130. When should the first water audit have taken place at the QEUH/RHC?

A I would have expected to have been asked to complete a water audit within the first year of operation and this is why I recommended that one should be completed in the 2017 annual report.

131. How confident are you that the QEUH/RHC water system was being adequately managed before your involvement in 2017?

A Given the issues highlighted in the first AE audit it is difficult to be confident that all the required risk reduction tasks were being delivered at the site.]

132. How effective would Sanosil Super 25 disinfectant (at 150ppm and contact time of 1 hour) be at removing all organisms and established biofilm?

A It is difficult to give a clear and precise answer to this question. It is my understanding that at the time Sanosil, through their UK distributor who was Water Treatment Products, recommended a dose rate of 150ppm for 1 hour, but a dose rate of 2000ppm for what they called a “shock disinfection”. It is assumed that a “shock disinfection” would be what is used when a system is heavily microbiologically compromised. The question, as put, therefore has no simple or direct answer.

133. How effective would removal of flow straighteners in taps be at reducing infection risk?

A If the removal of flow straighteners reduced the biofilm growth opportunity then the level of risk posed by the system would likely reduce. The type and design of flow straightener would also have to be considered. It is therefore not possible to give a specific answer to your question without knowing what the flow straighteners in question were like.

134. What report did you prepare in relation to chloride dioxide dosing?

A From memory I didn’t prepare a report on chlorine dioxide dosing

135. What was the outcome of the report?

A I do not know.

136. Why did you prepare the report?

A I do not recall preparing a report.

137. What actions were taken to implement the report findings?

A I do not know.

138. What was discussed at a meeting between you, Phyllis Urquhart, and Tommy Romeo?

A The only meeting that I recall having had with Tommy Romeo and Phyllis Urquhart would be the meeting on 4th May 2017 to gather information for the first AE(Water) compliance audit of the QEUH. What would have been discussed would be based on the question set that is used during an AE (Water) audit.

139. How did you obtain the DMA Canyon Risk Assessment 2015 report in advance of the above meeting? **Refer Bundle 6, Document 29.**

A I cannot recall how I obtained a copy of the risk assessment document. A copy of the risk assessment was available and was being used during the audit process but I have no memory of how it was obtained.

Declaration

140. I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

141. The witness was provided the following Scottish Hospital Inquiry documents for reference when they completed their questionnaire statement (Appendix A).

142. The witness provided the following documents to the Scottish Hospital Inquiry for reference when they completed their questionnaire statement (Appendix B).

Appendix A

A49360354 – Email Chain – Dr Inkster to colleagues regarding Chlorine Dioxide dosing of the water system – 01 to 05 July 2019
A33795534 – QEUH/RHC Portable Water System: Proposed Sanitisation Strategy paper dated 5 June 2018
A44312312 – NHS Glasgow Annual Report for 2017 ver 1 5
A38352950 – Dr Inkster – M Chelonae WTG – Received 01/06/2022
A44253107 – 5133 Water Technical Group Minutes
A43293438 – Bundle 6 – Miscellaneous Documents
A47395429 – Bundle 10 – Water Technical Group/Water Review Group Minutes
A48245730 – Bundle 18 – Documents referred to in the export report of Dr J.T. Walker
A48408984 – Bundle 19 – Documents referred to in the Quantitative and Qualitative Infection Link export reports of Sid Mookerjee, Sara Mumford and Linda Dempster

Appendix B

A33795533 - DMA Water: Written Scheme for Legionella Control QEUH & RHC: December 2016 – Bundle 18, Volume 2
A46629240 - ACOP L8 3rd Edition
A46126597 - Legionnaires Disease – HSG274 Part 2 – The control of legionella bacteria in hot and cold water systems – Bundle 15

A33010716 – SHTM 04-01: The control of Legionella, hygiene, ‘safe’ hot water, cold water and drinking water systems Part A – Design, installation and testing – December 2008

A33103394 – HFS, Water Safety (SHTM 04-01) Part C – February 2014

A33103400 - HFS, Water Safety (SHTM 04-01) Part D – August 2011 Page 118

A33103404 - HFS, Water Safety (SHTM 04-01) Part F – December 2011

A33662200 - 397 HBN 00-01 Oct 2014

A44312599 - QEUH 2017 Water AE Audit – Bundle 15

A44312600 - QEUH 2018 Water AE Audit – Bundle 18, Volume 2

A44312753 - QEUH audit 30012020 ver 1 5 – Bundle 18, Volume 2

A44311697 - Doc A for NHS GGC Management QEUH RHC ver 1.1 – Bundle 18, Volume 2

A44312707 - QEUH and RHC Feb 2022 Audit Doc A – Bundle 18, Volume 2

A44312832 - QEUH RHC AE Audit Jan 2023 – Bundle 15

A33870103 - Report prepared by DMA Water Treatment Ltd titled “L8 Risk Assessment (Pre-Occupancy) NHS Greater Glasgow and Clyde South Glasgow University Hospital” dated 1 May 2015 relating to site assessment concluding on 29 April 2015 – Bundle 6

Scottish Hospitals Inquiry
Witness Statement of
Darryl James Conner

This statement was produced by the process of sending the witness a questionnaire with an introduction followed by a series of questions and spaces for answers. The introduction, questions and answers are produced within the statement.

Personal Details

1. Name, qualifications, chronological professional history, specialism etc – please provide an up-to-date CV to assist with answering this question.

A Name Darryl James Conner
Specialism Profile; An experienced, MIHEEM and MIET Senior Engineer, that has prior experience as Operational Estates Lead within the Healthcare sector. Excellent leadership and management skills, with extensive experience in managing technical delivery, quality of output and staff development within the Health Built environment. Develops strong stakeholder and team relationships. Enthusiastic and highly motivated with ability to meet new challenges as a consummate professional Engineer.
Specialism Skills matrix Mechanical and Electrical operational maintenance
Critical analysis and review of M&P designs
Lead Authorised Person Experience – Ventilation, MGPS, HV & LV Systems
HAI Scribe, Project Management, Stakeholder Management, Managing teams and organizational skills, Risk assessment, Compliance reviews, SCART Training, Compliance auditing, Presentation Skills, Site Inspection & Reporting, IT Skills Microsoft Office, Authorising Engineer
Understands national standards, Oral and written communication

Education and Qualifications
2022 – Specialised Ventilation in Healthcare Premises, Leeds University
2022 – The Built environment IPC, L11, University of the Highlands & Islands
2020 – MINI MBA, Chester University
2020 – B.Eng. (Hons) Building Services Engineering, Glasgow Caledonian University
2015 – HNC, Electrical Engineering, West College Scotland
2010 – SECTT Approved Electrician ACCA 17th Ed
2002 – SECTT SVQ Level 3 FICCA 16th Ed recognised Electrician Apprenticeship

City & Guilds Qualifications
2023 – (2 day) Authorising Engineer (AUENG)
2022 – (2 day) Ventilation systems verification (HTM 03) (VSV)
2020 – (5 day) 18TH Ed BS7671 CITY & GUILDS.
2016– (4 day) LEVEL 3 AWARD (ME095)
PERIODIC INSPECTION, TESTING & CERTIFICATION OF ELECTRICAL INSTALLATIONS.

Authorised Person Training
2023 – PPL MEDICAL GAS PIPELINE SYSTEMS (AP)2021 – PPL HIGH VOLTAGE SYSTEMS (AP)
2019 – DEVELOP HOSPITAL VENTILATION SYSTEMS (AP)
2018 – DEVELOP LOW VOLTAGE SYSTEMS (AP)
2016 – BOC MEDICAL GAS PIPELINE SYSTEMS (AP)

Professional memberships
Member – IHEEM Registered (Member No. 104716)
Member – IET Registered (Member No. 1100784024)

Employment history

2021 – Present - NHS Scotland Assure – Senior Engineer

2020 – 2021 - NHS GG&C – Site Manager Operational Estates (Electrical)

2018 –2020 - NHS GG&C – (Interim) Site Manager Operational Estates

2018 – 2018 - NHS GG&C – Estates Manager

2014 – 2018 - NHS GG&C – Estates Duty Manager

2012 – 2014 - NHS GG&C – Estates Planning Supervisor

2010 – 2012 - NHS GG&C – Electrical Technician

Professional Background

2. Professional role(s) within the NHS.

A NHS Scotland Assure Senior Engineer Site Manager Operational Estates (Electrical) QEUH NHS GG&C
Interim Site Manager Operational Estates QEUH NHS GG&C
Estates Manager Operational Estates QEUH NHS GG&C
Estates Duty Manager Operational Estates QEUH NHS GG&C
Estates Planning Supervisor Operational Estates WIG NHS GG&C
Electrical Technician Operational Estates WIG NHS GG&C

3. Professional role (s) at QEUH/RHC, including dates when role(s) was occupied.

A 2020 – 2021- NHS GG&C – Site Manager Operational Estates (Electrical)
2018 – 2020- NHS GG&C – Interim Site Manager Operational Estates
2018 – 2018- NHS GG&C – Estates Manager
2014 – 2018- NHS GG&C – Estates Duty Manager

4. Area(s) of the hospital in which you worked/work.

A All my roles where I worked within the QEUH hospital required me to work across areas for all buildings within the QEUH Campus while being based in the Estates office occupied at the time.

5. Role and responsibilities within the above area(s)

A As Site manager for the Estates team at the QEUH, I carried professional responsibility for delivering key objectives, maintaining an efficient, compliant, cost-effective Estates service and was a key member of the Senior Management Team (SMT), I delivered professional and technical leadership, supporting Management, the Head of Estates and Director of Estates and Facilities, assisting strategic planning and implementation of maintenance policies. I managed with the professional application of guidelines and objectives, the Operational Estates financial, human, and physical resources in a professional, cost-effective, and efficient manner using maintenance and specialist contractors and the direct labour force. I was responsible for the management of complex healthcare engineering installations such as medical gas pipeline systems, emergency power generation systems, nurse call systems, theatre plant and equipment and for analysing maintenance options to ensure the continuity of life critical systems. I Optimised and facilitated the delivery of uninterrupted quality estates healthcare service by providing a 24-hour, 7 day a week maintenance service ensuring the safe comfortable & statutory compliant built environment which supports the effective provision of high-quality clinical care for our patients. This was achieved by maintaining and delivering an effective Planned Preventive Maintenance programme and reactive repair service as well as executing installation and commissioning works of critical plant and equipment to support the delivery of all clinical services.

6. Who did you report to? Did the person(s) you reported to change over time? If so, how and when did it change?

A When I was an Estates duty manager I reported to Ian Powrie (Sector Manager), David Bratty (Site Manager) and Colin Purdon (Site Manager) then latterly in this role Ian Powrie, Paul McAllister (Site Manager) and Colin Purdon. When my post changed due to organisational change, I moved off a shift rotation to fulfil a day shift Estates manager post where I reported to Paul McAllister & Colin Purdon while reporting for specific items to Andrew Wilson

(Sector manager) & Ian Powrie (Assistant Head of Estates) As Interim Site manager I reported to Andrew Wilson & Ian Powrie and as Site manager (Electrical) I reported to Euan Smith (Assistant Head of Estates), Alan Gallacher (Head of Compliance) & Mark Riddell (Head of Estates)

7. Who selected you for your role(s)? When were you selected for your role(s)? Please describe the selection process for appointment to this/these roles?

A I was selected for my Role as Estates duty manager in September/October 2014 by job application and a subsequent panel interview that was carried out by Ian Powrie, Alan Gallagher (Sector manager) and an individual from HR (Human resource) The interview consisted of qualification and experience review, technical questioning, current estates health care experience to date review , and a presentation about the challenges in bringing a new Acute hospital online. When I was moved from my shift role to day shift Estates manager role in April 2018, due to organisational change and department restructure of operational estates, it was organised by Andrew Wilson (Sector manager) and facilitated by various conversations with him with respect to timescales, phasing and pay protection. I was selected for my role as interim site manager for operational estates in November 2018 by expressing a note of interest by email for the pending vacancy to both Alan Gallager and Andrew Wilson which progressed to a subsequent panel interview carried out by Alan Gallagher and Andrew Wilson. The interview consisted of qualification and experience review, accomplishments to date, current experience, and discussion around what I can bring to the role in this seconded opportunity. When was I selected for my role as substantive Site manager operational estates role in Jan 2020 the selection process consisted of job application and subsequent panel interview carried out by Mark Riddell (Head of Estates) Euan Smith (Assistant Head of Estates) Colin Purden (Assistant Head of Estates), Tom Fulton (Assistant Head of Estates) and was based on providing a presentation and answering to the best of my ability a series of technical and hypothetical questions from each panel member around the duties required for the role.

8. Had you worked with any of your QEUH/RHC estates and management colleagues before your current role? If so, who had you worked with before this current role? When did you work with this/these colleague(s)? What role were you in when you worked with this/these colleague(s)? How long were you colleagues in this/these previous role(s)?

A I had worked with Mark Riddell at the Western Infirmary General GG&C when I was a technician, and he was a supervisor and latterly when I was a supervisor and he was an estates manger between the years of 2010- 2015 Approximately 5 years prior to becoming an estates duty manager at the QEUH

Specific role(s) at QEUH/ RHC

9. Describe your role(s) at QEUH; job title and responsibilities including day to day responsibilities, and details of staff who reported to you, who you worked alongside and who you reported to. Please fully describe where the role was in the hierarchy of the organisational structure.

A In my role as Estates Duty Manager, I was part of a multi-disciplinary team that included five shift managers who collectively managed 4 shift teams of 5 multi skilled technicians providing 24/7 emergency estates response to all emergency mechanical, electrical and plumbing issues reported within the QEUH Hospital Campus. Each shift manager undertook different AP training and appointments related to their experience and skill set, in my case I undertook Authorised person (AP) appointments for High Voltage systems (HV), Low Voltage systems (LV) and Medical Gas Piped Systems (MGPS). Each shift team under our management comprised of electrical technicians, mechanical fitters & plumbers. My role was to manage the individuals on my team's workload and specific task allocation through CAFM system, and to be the estates point of contact out of hours for all stakeholders that would require assistance, eg clinical and soft FM Teams. It was my responsibility to report on work carried out and ongoing maintenance carried out with working hours

while on duty inclusive of annual leave and sickness management of the individuals on my shift. A key aspect of this role was to regularly navigate the hospitals Building Management Software (BMS) regularly while on duty to monitor the status of key plant and equipment and react to system failures or system in efficiencies either by deployment of my shift team members or by utilising sub-contractor support. An additional aspect to this role was facilitating and supporting planned out of hours Planned preventative maintenance PPM arranged by the day shift estates team, for example annual Theatre maintenance and verifications or subcontracted small works.

In my role as Estates manager Day Shift, I managed the existing maintenance regime in place for the ventilation systems at the QEUH campus inclusive of distribution and review of existing PPM for ventilation plant and the continued roll out of planned annual Theatre verifications utilising agreed verification schedules, liaising with key clinical representatives such as theatre coordinators and Infection prevention and control representatives utilising mechanical NHS technicians, joiners and specialist sub-contractors. As my role developed, I was able to work alongside fellow estates colleague Kerr Clarkston to generate an accurate estate inventory of the QEUH ventilation assets by survey of asset quantity, existing asset document review, system criticality and compliance maintenance priority to assess the existing maintenance and frequencies against Scottish Health Care technical memorandum 03-01(B) SHTM-03-01(B) recommendations to inform and implement changes to the maintenance strategy for greater ventilation compliance within the healthcare estate. This was inclusive but not limited to progression of a verification schedule for isolation rooms, and extending the annual verification program to encompass all recognised critical ventilation systems for annual verification, such as CCU, HDU, MRI etc. During this role I worked with and contributed to estates supervisor workload, while directly managing the workloads of the mechanical dayshift technicians with respect to ventilation PPM and utilised contractor support to carry out my duties. Any escalations or requests for funding or costed remedial works I highlighted to

be carried out were reported directly to the site manager for verbal or written approval. The other aspects of this role were to implement my AP duties for MGPS maintenance undertaking review of contractor risk assessments and method statements and to facilitate the implementation of safe systems of work under permit to work. Additionally, I provided AP support to the site manager to carry out synchronous and black start generator testing alongside supporting my fellow Estate managers in collaborative working to facilitate all ongoing priority in a team approach to provide effective estates resource.

In my role as Interim Site Manager, I was Operational Lead for the Estates team at the QEUH, my duties included delivering key objectives, maintaining an efficient, compliant, cost-effective Estates service. As a key member of the Senior Management Team (SMT), I delivered professional and technical leadership, supporting Management, the Head of Estates and Director of Estates and Facilities, assisting strategic planning and implementation of maintenance policies. I managed professional application of guidelines and objectives, the Operational Estates financial, human, and physical resources in a professional, cost-effective, and efficient manner using maintenance and specialist contractors and the direct labour force. I would consult with the estates managers under my management on complex healthcare engineering installations such as medical gas pipeline systems, emergency power generation systems, nurse call systems, theatre plant and equipment and for analysing maintenance options to ensure the continuity of life critical systems. A key component of my role was to optimise and facilitate the delivery of uninterrupted quality healthcare by providing a 24-hour, 7 day a week while ensuring the safe comfortable & statutory compliant built environment which supports the effective provision of high-quality clinical care for our patients. This was carried out by maintaining and delivering an effective Planned Preventive Maintenance programme and reactive repair service as well as executing installation and commissioning works of critical plant and equipment to support the delivery of all clinical services.

In My role as substantive Site Manager (electrical) my duties and responsibilities were very similar to my interim seconded role however were discipline specific to the QEUH electrical infrastructure and its maintenance with focus on the planned maintenance and management of service contracts that ensured the safe continued operation of the QEUH HV & LV infrastructure. The mechanical and water disciplines were managed by Hugh Brown and Kerr Clarkston as newly appointed site managers with the MEP responsibilities being shared and all reporting to the newly appointed assistant Head of Estates Euan Smith.

10. When did you start your current role? How many people worked within QEUH hard facilities management when you started? How many people worked within QEUH soft facilities management when you started? Did the number of people working at QEUH change during your time there? If so, how many people changed in soft facilities management? If so, how many people changed in hard facilities management?

A I no longer work at the QEUH for NHS GG&C as I left to work with NHS Scotland Assure in July 2021. I started work at the QEUH in December 2014 1 month prior to the hospital being completed under construction. As the Hospital was handed over and the estates service commenced, I believe there was approximately 85 estates operatives however I do not recall how many of them were occupying a management role. Over my 5 years at the QEUH the number of people within estates management fluctuated due to retirement, individuals moving to new jobs and the recruitment process of advertising, interview, selection, and appointment in back filling vacant roles. I had no visibility of the soft facility management aspect of the service and generally would only have an awareness of who was leading that team and if that person had changed

11. How did Estates management operate on a daily basis? Was responsibility shared between different teams? If so, to what extent was responsibility shared?

A Estates management was directed by the site managers, who communicated with the Estates mangers and Estates duty managers who communicated with the supervisors who allocated the work to the technicians. This was not a fixed process, and parallel lines of communication and work streams would normally exist to carry out specific aspects of the maintenance service e.g. an Estates manager may instruct a technician directly when working under a safe system permit to work when carrying out a piece of work for a specific discipline

a) Describe the role of Deputy General Manager of Estates.

A I am not familiar with this job title; I do recall a General manager for Estates role and believe Alan Gallager occupied this role/title for a period of time. It is my understanding this position sat above the Sector manager role for operational Estates where the individual engaged directly with the directorship for estates and was responsible for strategic estates governance and budgetary allocation across the sectors within GG&C.

b) Provide the name and role of any managers you worked with. Please provide their Job (s) and role responsibilities.

A Tom Steel- Director of Estates, Gerry Kox- Assistant director of Estates, Alan Gallagher Head of Estates, Mark Riddell-Sector Manager/Head of Estates, Ian Powrie Sector manager/ assistant head of Estates, Andrew Wilson - Sector Manager, Euan Smith- Assistant Head of Estates, Colin Purdon Site Manager/Sector Manager, David Battey-Site manager, Paul McAllister- Estates Duty Manager/Site Manager, James Guthrie- Estates Duty Manager/Estates Manager, Mel MacMillian- Estates Duty manager/Estates Manager, Thomas Romeo- Estates Duty Manager/Estates Manager, Hugh

McCarten-Estates Duty Manager, Paul Allan- Estates Manager, William Madden- Estates Manager, Kerr Clarkson- Estates Manager/Site Manager.

12. Detail any other roles held by you within the Estates team and provide details as referred to above.

A All my roles held within the estates team are detailed within questions 4-9.

13. How was work delegated in the Estates team?

A All work was delegated within the Estates team through CAFM First, email and verbal communications.

14. How did you keep a record of work delegated?

A Delegated work was normally recorded by email.

15. How did you check that the work delegated had been carried out?

A I would have a conversation with the individual I allocated the work to or received confirmation by email that the work was completed and, in some instances, would physically view the completed work.

16. What concerns, if any, did you have about members of staff? If so, please describe these concerns. What action, if any, did you take in relation to these concerns?

A Generally, I had no ongoing concerns with members of staff and had a good working relationship with the members of staff that I worked with, if I had any issue with staff availability or work progress status, I would have a conversation with them to understand what support or control measures were required to remediate.

17. What concerns if any did you ever raise about management/ managers? If so, please describe these concerns. What action, if any, did you take in relation to these concerns?

A None that I recall.

18. Describe the interpersonal relationships within the Estates team. How would you describe communication between you and your supervisor(s)/ superior(s)? How would you describe communication to you from those you senior to you/ supervised you?

A Interpersonal relationships at the QEUH were good in my experience, good communication was fundamental in carrying out an operational estates service. I spoke with others the way I would like to be spoken to myself, which would include clear information and description of the task and any safe systems of work or supportive measures required to carry them out. This was also the case when having discussions with my line managers. On occasion instructions came from my line managers with a reactive element accompanied with short time scales and the pressure to carry out tasks as a matter of urgency, however I never felt that further discussion to clarify the task or additional support measures were not available to me should they be required.

19. How many occasions did misunderstandings or poor communication arise within the Estates team?

A In my personal experience these occasions where rare, instructions were generally clear and good working relationships were quickly established which made it relatively easy to discuss any work or themes which mitigated against mis understandings.

Training

20. What training had you undertaken for your role(s) in estates?

A Training was an ongoing part of my roles within GG&C Estates, when I started my role as an estates duty manager at the QUEH I had previously gained 2 years' experience as an estates coordinating supervisor at the Western Infirmary Glasgow and additionally was in my second year of my HNC in electrical engineering and had also completed my Authorised Persons training for Medical Gas Piped systems.

21. What qualifications did you have for your role(s) in estates?

A Please see A1 for qualifications and dates achieved.

22. What experience did you have working in estates prior to the QEUH/RHC? How similar was the industry, role, and responsibilities to your work in QEUH/RHC estates?

A Prior to working at the QEUH/RHC I was an estates coordinating supervisor at the Western Infirmary Glasgow which involved the planning and distribution of estates PPM to a team of multi-disciplinary technicians though a CAFM system which was beneficial in undertaking my new role as Estates Duty Manager but quite different in that the Estates Duty manager role required me to train and assume authorised persons roles for various disciplines including High Voltage systems,/Low Voltage systems, Medical Gas Piped Systems and latterly hospital ventilation systems.

23. Did you have any formal training or qualifications in respect of:

a) Water

A No.

b) Ventilation

A In September 2019 I received training for authorised person Hospital Ventilation systems and on its completion was subsequently interviewed and recommended for appointment for this discipline. The training course I undertook was delivered by PPL Training which was City & Guilds accredited and is intended to provide the necessary information to understand the core duties and responsibilities of the Authorised Person following HTM 03-01 and other associated guidance. The course provided guidance on the legal requirements, design implications, maintenance, and operation of ventilation within healthcare premises. It also covered the inspection and verification requirements as well as the compulsory measurements of performance to ensure ventilation systems achieve the minimum standards and operate to an

acceptable performance level. This training was beneficial and assisted me in applying its principles to the QEUH sizable ventilation asset, to drive compliance with SHTM-03-01 and also under the correct governance the implementation and control of a safe system to work (Permit to work) for critical ventilation assets

c) Infection Control

A No.

If so, please detail above any training and qualifications – when trained? When qualified? Who was the awarding body? Please describe how the training and qualifications applied to your work at QEUH.

24. Have you ever had any specific roles or duties in relation to the water systems operation or maintenance within NHS facilities? When did you have these roles and duties?

A No.

25. If you did:

a) What were these responsibilities?

A N/A

b) What was the purpose of these responsibilities?

A N/A

c) Were you aware of any specific legal responsibilities/ obligations relating to working with the water systems. If so, please detail.

A N/A

26. If you did not have any such roles or responsibilities in relation to the water systems operation or maintenance within NHS facilities:

a) Who did?

A Colin Purdon, Melville MacMillan & Kerr Clarkston

b) What were these responsibilities?

A Please see A26.

c) What did you understand the responsibilities to be?

A My understanding is the responsibilities were to manage and maintain the water system at the QEUH campus. This was done by planned preventative maintenance carried out by the management of subcontractors and Estates staff. The responsibilities also included the management of safe systems of work and regular attendance to the water safety management group and contribution the Water Written Scheme

d) Were you aware of any legal obligations/ responsibilities? If so, please detail.

A The responsibilities where to ensure the water systems at the QEUH campus complied with the guidance outlined within SHTM-04-01.

27. Have you ever worked on a larger scale water or ventilation system before? If so, when was this? How did this compare to working on QEUH? What was your role and duties?

A No, the ventilation and HVAC asset for the QEUH is of considerable size and complexity and requires significant resource in order to maintain in accordance with SHTM-03-01.

28. Do you consider that the QEUH had the 'significant resource' to maintain the water system in accordance with SHTM04-01? To the same extent, do you consider that QEUH had sufficient resource to maintain the ventilation system in accordance with SHTM 03-01?

A I was not involved in the management of the water systems; it was done by others.

For ventilation, I did not have an understanding ventilation at the time even though it is my skillset now, I cannot say unless it is all laid out within the CAMF system, which it was not until Ian Powrie and David Brattey started dealing with these matters. At the time in terms of the maintenance requirement, there was a general level of resource, which increased over time to a full compliment. It is however difficult to put a figure on the level of resource at the time. My duties as an estates duty manager at the time was emergency response out of hours.

Documents, paperwork and processes in place as at 26th January 2015

We know that handover of QEUH occurred on 26th January 2015:

29. What contractual documentation would you expect to see in place at handover?

A At the time of handover, I was not trained or appraised to know what to expect at building handover, so my assumption then was, all as fitted drawings, Schematics, commissioning documentation and operational maintenance manuals for all Hospital MEP and fabric systems followed by training and familiarisation within the hospital on these systems in readiness for maintenance commencement. Based on my knowledge and experience today I would expect to see any handover information agreed contractually and all information and deliverables outlined in accordance with the Building Services

Research and Information Association (BSRIA) A Design Framework For Building Services (BG6) Stage 6 deliverables which is the industry standard that provides clarity of the roles and duties of those involved in the design phases of construction and their responsibilities regarding each building design stage.

30. Describe the process for handover of QEUH:

A I was not involved with the formal handover of the QEUH and was not part of the project team who reviewed commission/validation data, test sheets or provided/accepted system/building sign off. My experience on the lead up to handover was regular familiarisation sessions provided by the builder Brookfield Multiplex to explain to the pending Estates team, system layouts and system functionality.

a) What contractual documentation was in place?

A As per A32 it was not my role to quantify or check this, as an estates duty manager I was given access to the online Zutec portal which had daily updates of system O&M documentation for viewing and familiarisation.

b) How was the relevant paperwork handed over to QEUH?

A I do not know what the agreed process was for this.

31. Was the building of the QEUH complete at handover – if not, what was incomplete? Was QEUH ready at handover? If not, why was it not ready to be handed over? Refer to Estates Communication Bundle, document 3 – ‘Stage 3 Adult and Children's Hospital Completion Certificate’ defects noted therein when considering this question.

A It was not my role as Estates duty manager to know if the QEUH was ready for handover, that was the GG&Cs project team who were responsible for gaining this assurance and sign off. Given my visibility of the number of contractors on site at that time and having reviewed “Estates Communication Bundle, document 3 – ‘Stage 3 Adult and Children's Hospital Completion

Certificate' this would indicate that it was not, I can't comment why the QEUH was not ready for handover as I don't know what was agreed between the project team and the main contractor.

32. Describe the QEUH/RHC site at handover in January 2015.

A I recall this being a very busy time, with lots of contractors on site, regular arrival of new NHS personnel and service providers, various departments and services occupying areas of the building and the estates management team processing and dealing with defects reported by hospital staff and contractors on a daily basis.

33. Did Multiplex remain on site? How was this managed, and were records kept of Multiplex staff being on site, if so who was responsible for this and where were such records kept? Did you have any concerns?

A Yes, Multiplex and their sub-contractors remained on site, each contractor reported to the allocated estates office at the time and signed in and out when they were on site under estates control. These documents were in paper form. I cannot recall if the documents were retained after the defects period had ended however if they were kept, they will exist in the Estates archive at the QEUH Estates department.

34. At handover who was responsible for ensuring that paperwork was produced to confirm contractual compliance?

A I believe this was Greater Glasgow and Clyde's project team.

a) Paperwork

A I believe this was Greater Glasgow and Clyde's project team.

b) O&M Manuals

A I believe this was Greater Glasgow and Clyde's project team.

c) M&E Clarifications Log

A I believe this was Greater Glasgow and Clyde's project team.

d) Others paperwork as per the contract

A I believe this was Greater Glasgow and Clyde's project team.

Provide as much detail as possible – was anything missing? If so, how was this managed?

35. What commissioning and validation documentation for the water system did you see at handover? What commissioning and validation documentation for the ventilation system did you see at handover?

A I did not review commissioning or validation information at handover, this would be the responsibility of GG&C project team and appointed stakeholders.

a) What documentation would you expect to be available for both the water and ventilation systems?

A Please see answer to Q30.

b) Who was responsible for this documentation?

A Generally, contractually the builder/PSCP is responsible for producing this documentation and the project team are responsible for the review and acceptance of it.

c) What was your role?

A My role was Estates Duty manager; I was not responsible for the review of handover documentation.

d) Were you ever aware of commissioning and validation had been carried out?

A Yes in the course of the first year post-handover while working within the estates service and navigating the Zutec portal as and when required for information to assist with estates tasks and PPM the portal did contain

commissioning information for MEP systems, I recall from my 5 years spent at the QEUH there was no original validation documents specific to ventilation systems, any validation type information was subsequently obtained through generated annual verification reports. Validation reports for ventilation systems were sought for new installations or refurbishments by the estates team in the years since building handover.

e) If not, why were you not aware of commissioning and validation having been carried out?

A The awareness and importance of system validation became more apparent to the estates team as our training, and experience progressed in our roles.

36. Was any other paperwork missing at handover? If so, would you consider this missing paperwork to be of importance?

A Yes, as previously advised ventilation validation paperwork was not available from building hand over, I would consider this of importance because without it you have no way to be assured the commissioned design meets the requirement of SHTM-03-01 within the first year of service prior to annual verification.

37. What concerns, if any, did you have regarding there being ‘no original validation documents specific to the ventilation system’? At the time, did you expect to see this? What concerns, if any, did you have regarding validation of the ventilation system having been carried out prior to handover?

A At that time I didn’t have any concerns, and it would not have been for me to make sure that was the documentation was in place, it would have been capital project team to ensure the documentation was in place, as they were accepting handover. The importance of validation certificates becomes apparent when carrying out tests and from maintenance perspective you have to make sure that it was in place. It becomes a requirement to have the validation when you come to verify the system, as you verify against validation. The assumption was that when moving to hospital following

handover that this had been dealt with by others, but it obviously had not, but I had no reason to expect that it had not been carried out. I was not tasked to look at this at the time, our, as in my team within Estates, responsibilities time was familiarisation, for example, familiarising myself with ZUTEC, where schematics were, and commissioning documents would have been. The lack of validation came to light for me in 2018 when I moved to day shift Estates manager, and between March 2018 to November 2018 when I became interim site manager. Tommy Romeo was my day shift Estates manager predecessor in that regard.

38. Operating systems at handover:

a) How many staff were allocated to maintaining operating systems and how was this determined?

A I recall the entire estates team number of staff was going to be approximately 85 individuals inclusive of manager, supervisors, technicians, maintenance assistants and admin support. I believe this number was requested/ agreed by senior management at that time.

b) What training was put in place for maintaining the operating systems?

A All operatives were invited to attend system familiarisation sessions on the lead up to building hand over, and then at various times within the first year undertook authorised person or competent person training depending on their position, role and discipline within operational estates.

c) Who carried out the training? Refer to Estates Communication Bundle document 5 – ‘Brookfield Multiplex Client Training & Familiarisation Register for Ventilation’.

A Brookfield Multiplex and their main MEP subcontractor Mercury Engineering.

d) Were Multiplex involved in the training?

A Yes.

e) Was sufficient training provided to allow staff to operate the systems?

A No familiarisation sessions were provided to estates staff system providing systems overview and location awareness, they were sufficient to allow operatives with existing skill sets and competency to develop their ability to operate the systems.

f) Please describe the manuals/ documents that were handed over.

A This would be for NHS GG&C project team to advise, my early review of the Zutec platform showed system layout drawings, schematics, circuit charts and other engineering information, some items were populated, and some were not, information appeared to still be getting uploaded onto the portal.

39. What was your involvement/ role in the handover process? How did you manage this?

A I did not have any involvement in the handover process, this was carried out by NHS GG&C project team.

40. Who signed the completion certificates?

A I do not know who signed off the completion certificates.

41. Who was the person with the responsibility to sign the completion certificates under the contract?

A I have not seen the contract between GG&C and the Contractor.

42. Estates Communication Bundle, document 3 – ‘Stage 3 Adult and Children's Hospital Completion Certificate’:

a) What is this?

A Having reviewed this document, it looks like a completion certificate outlining areas of completion and listing outstanding defects and an agreed time scales for completion.

b) Have you seen it before?

A No

c) What checks were carried out prior to sign off?

A This would be for NHS GG&C project team at the time to advise.

d) Looking at the defects referred to in the completion certificate documents 3 above: Look also at Estates Communication Bundle, document 4 – 'Capita NEC3 Supervisor's Report (No 46)':

(i) What are these defects?

A These defects are a mixture of MEP and fabric detail.

(ii) What was the impact of these defects?

A In order to assess the impact of these defects the project team would need to have carried out a risk assessment based on the completion time of these defects against the planned occupancy for the building outlining what potential services and clinical aspects may have been affected by the incomplete items detailed within the document.

(iii) Why two years to deal with the defects?

A I don't know, perhaps this was contractually agreed.

(iv) Who decided that it was appropriate to accept handover with outstanding defects?

A I don't know, handover and the acceptance of a building is generally the responsibility of the project team tasked with delivering the project.

(v) Is this usual practice in the construction industry?

A I believe the normal timescale within industry is 1 year however can be different depending on what has been contractually agreed.

43. Refer to Estates Communication Bundle, document 8 – ‘Programme for handover to start of migration’:

a) Do you know what this is?

A This is a handover schedule recording, activity, start and percentage completion/ actual dates.

b) Have you seen it before?

A No.

c) What are the numerous defects?

A There are over 400 items recorded ranging from snagging to equipping to planned phased occupancy.

d) What is your understanding of the purpose of this document?

A My understanding of this document is to provide a rolling record for the project team to control, what is to happen, when it is to happen and how much of the task has been completed.

e) What comments, if any, do you have regarding the number of defects?

A The number of items on this document seem of a significant quantity and are not entirely detailed for a 3rd party to understand exactly what the task is to be carried out.

f) To what extent were you aware of this document at handover?

A None.

g) If not, should you have been aware of this document at handover?

A I don’t believe so, I think the visibility of this document and its status should have been shared between the project team and the head of operational estates to provide context of the status of the project in readiness for occupancy and operational maintenance.

44. What did the contract say about retention of certain parts at handover? Was this enforced and why?

A I had no visibility of the contract in my role as estates duty manager.

45. To what extent did Multiplex retain responsibility for the build following handover? Did Multiplex give any warranties? What were the terms of any warranty relating to Multiplex's work? How long was the warranty period following handover in January 2015?

A I don't know, I believe 2 years was mentioned earlier in the questionnaire and was in keeping with general awareness of the hospital at that time.

46. How many companies have on-going responsibility following handover? If so, describe the responsibilities of the companies. How long post-handover were the other companies involved for?

A I do not know how many companies had on going responsibility following handover.

47. What concerns, if any, did you have about the opening of the hospital after handover? Refer to Estates Communication Bundle, documents 19 and 21 and 21.1 when answering.

A I recall being personally surprised how quickly the project went from what still looked like a building site in late December to a finished facility that was being handed over for use in January. Having reviewed bundle docs 19,21,21.1 I find the reported defects by Ian Powrie in keeping with what the estates team and clinical teams were reporting to him on a daily basis for escalation with Brookfield Multiplex. The volume of wide spread system and fabric defects being regularly reported I found were often highlighted through occupancy and use of the systems and reporting by the users. Where there was areas of work still to be completed, I was of the understanding these items would have been agreed between the GG&C and the contractor, however for systems that were recognised as faulty under use such as e.g PTS system referenced within the bundle or the functionality of heating valves for clinical areas, did

raise the question if correct commissioning of these systems had taken place and why component failure was taking place at such an early stage since handover which was a regular challenge for estates within the early years of ownership.

48. What action, if any, did you take regarding the question fo the correct commissioning of these systems?

A It wasn't my remit; I would not have had visibility of the commissioning information. This is something which would have been reviewed and signed off by others. I was not in a position to question that. I would say that it was quite surprising to me that prior to Christmas building looked second fix, and yet when we came back after the Christmas break the building had a veneer of finish, there must have been a significant work force to get it to that stage in that time.

(a) Was there anything missing that you thought should have been constructed/installed? If so, please describe what was missing.

A This is difficult to say without knowing what was contractually agreed, at a glance areas that were deemed as complete and ready for occupancy looked visually complete and tidy, this was not an indication of the correct functionality of the systems within these areas.

(b) Did you have any other concerns about areas of the hospital at handover?

A I was concerned about the shear size of the building and the little time that most staff were given to familiarise themselves with its demographic and the complex systems within it. It was apparent from quite early on that all required specialist service contracts were not yet in place and would make maintenance, break downs and critical spares a challenge.

49. Refer to Estates Communication Bundle, document 22 at the point of patient migration Mhairi Lloyd states that there were rooms/ areas ‘not yet fit for purpose’: Look also to Estates Communication Bundle, document 19:

a) What was your understanding of the concerns – namely what the concerns were and why?

A Having read this document my understanding is that Infection control individuals have reported that the decon room within A&E is not ready for use due to room cleanliness, incomplete fabric and concerns about the rooms ventilation strategy.

b) To what extent were you involved with the dealing with any concerns?

A Ian Powrie was dealing with these concerns.

50. Detail the snagging process, refer to Estates Communication Bundle, documents 90 and 91 when considering your answer detail:

a) What happened

b) How long were Multiplex on site following handover

c) Main areas for snagging

d) Records of works carried out

e) Sign off – who as responsible and when signed off.

A Snags were recorded by estates management operatives on the FM first system, these issues where then filtered by date and then extracted onto a spreadsheet (with assistance from NHS IT operatives), the spreadsheets where then issued to the builder for review, acceptance and progression to completion. Once advised by the builder that the snags had been addressed, estates supervisors would check were possible the completion of these items and the jobs would then be manually closed of on fm first to record their completion. This process was ongoing throughout the early years from handover where the multiplex and their contractors were still on site, I recall the warranty period came to a end early and all items of a similar nature where then managed by estates as best as possible while a claim was

compiled by senior management to address any long outstanding warranty claims.

51. Refer to Estates Communication Bundle, document 132 with the benefit of hindsight do you agree with Frances Wrath's comments that all area were commissioned in line with Employer's Requirements?

A As Estates Duty manager I had no visibility of the contract ERs or legislative requirements requested with respect to commissioning there for cannot comment.

Wards and Hospital Occupation from January 2015

52. At the point of taking occupation of QEUH/RHC on 26th January 2015 please confirm whether the following wards were fully handed over from Multiplex to NHS GGC:
Ward 2A/2B
Ward 4B
Ward 4C
Ward 6A
Ward 6C

A I don't know, NHS Project team to advise.

53. Please also confirm your understanding of the ward specification and patient cohort to be located in each ward.

A As Estates Duty Manager I had no visibility of the buildings agreed environmental matrix, in my experience working at the QEUH my understanding was that Ward 2A was Children's Haematoncology, 2B was children's Oncology day unit, 4B was Adults BMT,4C was adults Haematoncology, 6A was a general clinical ward later utilised as a decant ward for children's 2A patients & 6C was a general medical ward.

54. If a ward or wards were not handed over on 26th January 2015, or were partially handed over, please confirm:

a) Why they were held back?

A I don't know.

b) Any financial consequence to both Multiplex and NHS GGC of the ward(s) being held back?

A I don't know.

c) What works were carried out in order to allow this ward(s) to be handed over the NHS GGC?

A I don't know.

55. Were any other wards, aside from those referred to above, retained? Answer as above?

A I believe a handover Ward 4B was held back as it was still undergoing construction to facilitate an adult BMT application.

56. We know that the energy centre was retained by Multiplex

a) Why was the energy centre retained?

A I believe there was aspects of the energy centre to still be completed.

b) What financial consequences, if any, arose for either Multiplex or NHS GGC if the energy centre was retained?

A I don't know

c) What works were carried out to allow hand over of the energy centre to NHS GGC?

A I recall post handover installation of boiler safety valve flus, however had no visibility or responsibility regarding the completed schedule of works to facilitate handover, this would be for the project team to advise.

57. Were any other parts of the hospital retained by Multiplex pending works being carried out? Why? What works required to be carried out prior to them being handed over?

A I don't know

58. At the point of handover on 26th January 2015 how satisfied were you that all areas accepted by NHS GGC were designed to the intended specification and suitable for the intended patient cohort, meeting all the relevant guidance requirements?

A At this point in time I had no idea what the intended and agreed design specification was, the handover was managed by NHS GG&C project team.

Asset Tagging

59. Describe and detail asset tagging:

a) What is this?

A Asset tagging is coding and labelling a specific item of plant or equipment.

b) Why is this important?

A It is important as it provides record of equipment detail, date of installation, location and possible maintenance history.

c) Who was responsible?

A I don't know, In my experience this is normally a pre requisite under a contract for the builder to under take and submit as part of the client handover package.

d) What was the impact if this was not done?

A In accurate asset schedules, risk of missed maintenance and servicing.

e) What concerns, if any, did you have about this?

A I was not concerned by this as the plant in my experience was asset tagged and as the PPM system was still in development for integration with our CAFM system FM First, led by Alan Gallager Head of Estates, it was my understanding this exercise would form part of the checks required prior to the system being implemented.

f) Did you escalate these concerns? If not, why not?

A No See A59e

g) Discuss any issues regarding asset tagging and how you managed this?

A No

60. Was there a contractual requirement to provide CAMF?

A I don’t know

a) Again, what is the purpose of this and who was responsible for providing this?

A I don’t know who was contractually responsible for providing this.

b) What is the purpose of CAMF?

A The purpose of CAMF is to provide an operational maintenance team with the tool to effectively carry out maintenance of building services, whereby all maintenance is planned and generated at the frequencies of guidance of which the asset is benchmarked against.

c) How does ZUTEC differ from CAMF?

A Zutec is a digital platform where as fitted drawings, schematics, commissioning and validation information can be uploaded to for viewing by pre-selected operatives with approved user names and passwords.

d) Should CAMF have been provided at handover?

A In my opinion, yes

e) Should ZUTEC have been provided at handover?

A In my opinion yes

(i) Who was responsible for ensuring provision of CAMF and ZUTEC?

A I believe the original provision of Zutec was Multiplex and CaFM I don't know.

(ii) What were the consequences of these not being provided?

A The reasons outlined in Answer 60b are extremely challenging to achieve with certainty.

(iii) What action was taken to remedy matters? Were Multiplex contacted?

A I don't know

61. Provide information on any issues in relation to CAMF and ZUTEC:

a) Operation

A At the time of handover CAMF was only operational for job creation and user reporting, it was not set up to be used to implement asset Planned Preventative Maintenance (PPM) Zutec was challenging to navigate until familiarisation was gained whilst not all relevant information regarding building services was available as system uploads were on going and continual during the first 2 years post handover.

b) User suitability

A Please see A 61a

c) Any other matters

A Please see A 61a

d) Who was this reported to, what action was taken to remedy matters?

A Any matter where escalated to Ian Powrie for progression

62. Did your team or NHS IT develop a system for asset registration? If so, when and how long did it take following handover.

A I don't know, I was not involved with this.

HEPA filters

63. Were HEPA filters installed in the relevant rooms at handover (January 2015)?

A I don't know what rooms were agreed for installation of HEPA filters at handover.

64. What issues, if any, were there with HEPA filters? Refer to Estates Communication Bundle, document 22.

A I don't Know.

65. If so, what issues were you aware of?

A I don't know.

66. Dr Gibson in her statement refers to HEPA filters not being in place at the point of handover in wards 2A/B.

a) To what extent, if any, do you agree with Dr Gibson's statement above concerning HEPA filters?

A I agree if there is a highlighted clinical requirement either by design or application or recommended by guidance then HEPA filters should be in place to support the agreed ventilation strategy.

b) What was the impact of HEPA filters not being installed?

A Lower level of particulate filtration.

c) What was the potential patient impact of the absence of HEPA filters?

A The potential impact is dependent on the patient cohort served by the system that may include them.

d) What was done to resolve any HEPA filter issues?

A The resolutions are dependant on the perceived filter issues, which can be addressed via installation, challenge testing and subsequent replacement and verification.

e) What filter should have been installed at handover?

A The accepted design specification of filter that should have been stakeholder agreed through design review and cognisance of relevant guidance that's suitable to support the patient group it is intended to serve.

f) Who was responsible for providing HEPA filters and ensuring that they were installed during the build?

A I don't know what the contractual agreement was, see NHS GG&C project team.

67. Were HEPA filters missing from any other wards following handover?

A I don't know what was contractually agreed to be installed during construction, see project team.

Chilled beams

68. Can the witness recall any specific events in relation to chilled beams?

A I can remember on occasion incidents in rare atmospheric conditions when chilled beams had condensation dripping from them that had a global effect on the hospital. I also can remember an incident within 6A where a chilled beam was reported to be leaking, that was found to be a result of pipe contraction due to energy centre boiler failure and the use of flexi fittings to

connect the flow and return of a chilled beam rather than compression fittings which mitigate the risk of leaks against thermal contraction.

For example:

a) Dripping chilled beams in critical care refer to Estates Communication Bundle, document 63.

A I don't recall this particular incident.

b) Issues with dew point controls refer to Estates Communication Bundle, document 65.

A Please see answer to A68a

c) Ward 2A cubicles 8-11 refer to Estates Communication Bundle, document 106.

A I don't know however agree with Ian Powrie's assessment that no chilled beams exist within the isolation rooms and that cooling is achieved centrally at the AHU.

d) Leakage chilled beams Ward 6A refer to Estates Communication Bundle, document 138.

A Please see A 68

e) Leakage chilled beams Ward 6A refer to Estates Communication Bundle, document 139.

A Please see A 68

f) Dr Christine Peters tells us that she inspected the beams in 3 patient rooms in ward 6A and *'found that they were dirty with water dripping through from the corner, Darryl Conner stated that the boiler had been out of action and that this had meant that the hot water supply pipes had contracted causing the leaks to occur at the joints.'*

Explain your understanding of the issue:

A Please see A 68

g) Explain your understanding of the SBAR Dr Christine Peters prepared summarising the issue?

A It is my understanding that Dr Christine Peters is required to carry out a SBAR after attending the incident as a microbiologist in order to record the assessment of the issue and the mitigative and reactive measure that are to be implemented in order to minimise the risk of infection.

h) Leakage chilled beams Ward 6A refer to Estates Communication Bundle, document 142.

A I believe this document refers to the discussion of the SBAR and any additional measures and remedial actions that may be taken to minimise the risk of infection.

69. What involvement, if any, did you have in respect of the SBAR? Including any involvement in remedial actions?

A From my recollection of the incident recorded in this SBAR was following a leaking chilled beam in a patient room, as a patient's foot got wet from the leaking chilled beam. I believe Infection Control colleagues carried out this retrospective SBAR to record and address the issue. There had to be a rapid HAI Scribe to inspect the chilled beams. My remit was to support inspection of the chilled beam and to facilitate the protective measures outlined within the HAI Scribe, supporting physical access to other members of staff, to look at mechanical, electrical and plumbing factors, and what would potentially have caused the leakage. I recall that we had a boiler failure in that time. Due to the nature of the connection to the chilled beams, the flexi hose style doesn't do too well under thermal contraction and expansion, it seemed that when the connection contracted and expanded because of heating flow and return temperature fluctuation due to boiler failure the pipe connections to the chilled beam had leaked. In my view, if condensation was the cause of this ingress then it would not just have been one room that was affected, It seemed to me to be the boiler failure and the drop in temperature had caused the fitting to fail

under thermal contraction. Estates had to ensure adequate inhibitor was in the system post repair as an action. I don't think there was an awareness among IPC at that time that chilled beams are closed circuit sealed systems, this means that the quality of water in pipework is not the same standard as consumable domestic standard at a sink tap or showerhead. The inspection prompted remedial works, which involved retro-fitting the hoses to chilled beams for compression type fittings to mitigate the risk of future leaks.

i) Any other issues/ incidents not mentioned above.

A None that I can recall.

For each event please tell us:

a) What was the issue?

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved?

d) What was the escalation process?

e) Were any external organisations approached to support and advise?

f) If so, what was the advice?

g) Was there opposing advice and by whom, and what was the advice?

h) What remedial action was decided on and who made the decision?

i) Was the issue resolved – consider any ongoing aftercare/support/monitoring;

j) Any ongoing concerns witness had herself or others advised her of?

k) Was there any documentation referenced during or created after the event. For example an incident report?

l) Did anyone sign off to say the work had been completed and issue resolved/area safe.

Write your answers above in the relevant section.

70. Tell me about your understanding of the use of thermal wheels in areas where immune compromised patients are treated:

A My understanding is that they are not recommended for this application due to the risk of potential air bypass from extract systems dependant on the component layout of the AHU of which they are installed.

71. To what extent can you recall any specific events in relation to thermal wheels?

A I do not recall any specific events with respect to thermal wheels other than concern was raised that their use within the original Ward 2A ventilation installation may not be suitable to support the clinical application of an immune supressed patient cohort.

a) What was the issue?
b) The impact on the hospital (include wards/areas) and its patients (if applicable)
c) Who was involved?
d) What was the escalation process?
e) Were any external organisations approached to support and advise?
f) If so, what was the advice?
g) Was there opposing advice and by whom, and what was the advice?
h) What remedial action was decided on and who made the decision?
i) Was the issue resolved – consider any ongoing aftercare/support/monitoring;
j) Any ongoing concerns witness had herself or others advised her of?
k) Was there any documentation referenced during or created after the event. For example an incident report?
l) Did anyone sign off to say the work had been completed and issue resolved/area safe.

<u>Combined Heating and Power Unit</u>

72. Describe the Combined Heating and Power Unit (CHP)

A Three gas fired engines connected to generators located on the ground floor of the QEUH energy centre that produce electricity that is fed back to the Scottish Power network and heat that is utilised to support the flow and return

temperatures of the primary medium hot water heating system that serves the QEUH & RHC allowing for a lesser requirement for running of traditional boilers dependent on seasonal conditions.

a) What is the purpose of the CHP?

A Please see A 72.

b) What condition was the CHP in at handover?

A I do not recall.

c) What information do you have to support your view on the CHP's condition?

A None.

73. Was commissioning and validation of the CHP carried out prior to handover?

A I don't know- Project team to advise.

a) What commissioning and validation documentation did you see, if any?

A None, it was not my position to be in receipt of this information at that time.

74. Refer to Estates Communication Bundle, document p90

a) Who was responsible for ensuring that the commissioning and validation documentation was in place?

A The document would indicate that this was the responsibility of Brookfield Multiplex.

b) Where were records of the commissioning and validation for the CHP kept?

A I believe these where uploaded onto the Zutec portal.

75. Who was responsible for ensuring that the CHP was operating correctly?

A Estates appointed a specialist sub contractor to ensure the safe operation of the CHPs, it would be the responsibility of the builder to ensure they are operating prior to handover and acceptance.

76. If the CHP was not operating correctly, could this impact patients? If so, how? Refer to Estates Communication Bundle, document 12

A If CHPs are not working correctly, they can impact the heating systems ability to achieve the correct flow and return set points, which in turn can affect the temperature that patients experience within the hospital becoming too hot or too cold dependant on the effectiveness of the Medium Temperature Hot Water (MTHW) control strategy.

77. Estates Communication Bundle, document 17:

a) What is meant by labs flushing?

A Flushing of a new system is a standard commissioning engineering practice before interfacing with the medium of which it is to be connected by.

b) What issues, if any, arose from this?

A I was not involved.

c) What is the importance of this?

A It is important to remove debris, deposits within the pipes, and any other unwanted materials that may compromise the performance of your system

d) Discuss your knowledge of the reference to a ‘40 year old system’:

i) Explain what the 40 year system was:

A I believe the are referring to the age of the heating system that serves the Neuro surgery building.

ii) What was the issue(s)?

A It sounds like they are concerned in flushing a old antiquated system can cause additional system failures and leaks.

iii) What was the potential impact?

A Please see ii

iv) What actions, if any, were taken to address the issue(s)?

A I was not involved.

78. What was your understanding of how the CHP should be operated?

A My understanding is that the CHPs where to run all the time to as a base heating medium to be topped up with the sequential operation of boilers to meet the hospitals seasonal heating demand.

79. What were the cost considerations for the operating of the CHP? What considerations impacted on its operation?

A I can't comment on cost as this was not my responsibility, however, the CHPOs are essentially engines that run all the time and can stall under minor component failures such as a faulty spark plug, the QEUH heating system however is resilient from a heat generation perspective in that additional boilers can be started automatically in order to meet a specific set point.

80. How was the CHP system being operated by GGC?

A An appointed sub contractor managed the day to day operation of the CHPs via remote telemetry and site visits.

81. What operational issues, if any, were encountered by GGC with the CHP? Refer to Estates Communication Bundle document 12.

A This document references over heating issues, I do not recall this specific one.

82. Refer to Estates Communication Bundle document 16:

a) Have you seen this before?

A No.

b) What is this document?

A This is a list of FM First Job tickets allocated to the contractor BAM to action.

c) Column 274 – ‘all CHPs cut out’ – what does this mean? How would this have impacted patients?

A Column 274 reports a G59 issue, which is a mains Protection Relay/ electronic monitoring device that looks at the quality and stability of the mains electricity. It is programmed to certain fixed parameters dictated by the DNO, these typically include voltage, frequency, if these parameters are not met the CHP will go off, this could potentially affect the hospitals heating network should there not be adequate boiler capacity on standby to meet the buildings heat load.

d) Refer to Estates Communication Bundle, document 36 what was the incident referred to? Were you involved? How was this matter resolved?

A No I was not involved.

83. Refer to Estates Communication Bundle, documents 19 & 20:

a) Provide information about the concerns you had in relation to the building temperature and power.

A I do not recall this incident.

b) What was your involvement?

A Please see A-83a

c) Was this recorded on Zutec?

A Please see A-83a

d) What was the impact of these issues on patient migration?

A Please see A-83a

e) Were matters resolved? If so, how? If not, what was the consequence?

A Please see A-83a

84. Refer to Estates Communication Bundle, document 91, page 754:

a) Look at column 78 – what does debris within the AHUs mean?

A t is not clear from this document what the debris was, suffice to say no debris should be within a functional AHU.

b) Is this something you would expect to see?

A No

c) What was the impact on the AHUs?

A I don't Know

d) How was this matter resolved?

A I don't Know

85. What happened in respect of Zurich?

A I don't Know

<u>Water Guidance and Obligations</u>

86. What guidance applies to water? How did you/others ensure that guidance was complied with? What contractual documents, if any, would you consult to ensure guidance was complied with?

A SHTM-04 parts A-G, I was not responsible or trained and appointed for the management of water systems.

87. Who was responsible for ensuring a safe water supply following handover?

A Operational Estates.

88. What water safety training was provided to all maintenance staff, estates officers and contractors?

A I don't know.

.

89. What was your knowledge and understanding of Health and Safety regulations on control of legionella at the time?

A Please see A-86

90. What legionella training was provided to all maintenance staff, estate officers and contractors?

A I don't know.

91. What water borne pathogens (other than legionella) training was provided to all maintenance staff, estate officers and contractors?

A

92. Who was the Dutyholder?

A I don't know.

a) Were you aware of obligations to appoint an authorised person or the like to discharge water supply safety? If so, who was appointed? When, for what period? If not, why not?

A I was aware that these obligations were the responsibility of a designated person but did not know who that was at that time.

b) What is the importance of appointing a Dutyholder and authorised person? Was this done at QEUH/RHC?

A Given my experience today in my current role I can advise that appointing a dutyholder and authorised persons for any discipline is fundamental in establishing a hierarchy of management that supports compliance and maintenance of any system under MEP.

Water - Commissioning and Validation (C&V)

93. What commissioning and validation documentation did you see prior to handover in 2015 – if not, who would have had sight of this?

A I don't know, the project team should have had sight of this.

94. Where is this commissioning and validation documentation ("C&V") stored generally on the hospital system?

A If it was available, it would be stored on the Zutec platform.

95. what concerns, if any, would you have If the water system were to have no C&V before handover in 2015? Why were you concerned?

A I would be concerned that no system can be considered fit for purpose if it is not commissioned and validated prior to its use.

96. Describe the same in respect of verification and the cold-water supply system.

A Please see A-94

97. What C&V of the water system was carried out post-handover?

A I don't know.

a) Who was responsible?

A I don't know, in my experience this should be carried out pre handover.

b) How was the C&V recorded?

A I don't know.

c) Any concerns arising from post-handover C&V? If so, why did these concerns arise?

A I had no concerns at that time.

Water system – general

98. Describe any ward/area specific water systems used?

a) Detail the individual ward water specification

b) What were/ are your thoughts about this

c) Why, if applicable, did certain wards have differene water systems

d) Was there a standard protocol for sanitising water systems?

A At the time as a newly appointed estates duty manager who was not involved or appointed in water management I only had a high level overview of the QEUH water systems in that the building was served by separate water supplies that entered the (Adults) basement tank room via separate water metres serving two raw water tanks, these tanks fed at the time two viola filtration units that fed two filtered water tanks, the draw off from both these tanks went to a manifold arrangement that fed two sets of booster pumps, 4 bar and 7 bar that served different areas of the hospital (4 bar lower levels & 7bar for higher).

99. To what extent were the standard protocols for sanitising water systems used on a system of the size and complexity of this one?

A I don't know.

100. Were consultants brought in to advise on sterilisation of the water systems?

a) Who were they?

b) Had you worked with them before?

c) Describe and comment on the methodology used.

d) Who decided to accept it or not.

e) Did it work?

f) What paperwork or records were kept in relation to their installation; maintenance or flushing?

g) How were these kept, on paper or electronically?

h) What equipment for recording work was used by employees doing day to day tasks?

i) How was that then reported back and checked?

A I believe a company called DMA Canyon where employed to advise and assist on the sterilisation of water systems and reported to Ian Powrie directly who would be best placed in my opinion to answer the above questions regarding methodology, acceptance and record keeping.

Water Maintenance

Refer to Estates Communication Bundle, document 10.

101. Explain the cleaning and maintenance of the water system, taps, drains, shower heads etc. When doing so consider:

a) What is the cleaning regime?

A I am not trained in water management nor was tasked or appointed to carry this out at the QEUH during my employment, my disciplines where electrical and mechanical not plumbing and water management.

b) What is dosing?

A Dosing is when a water system is treated with specific chemicals in calibrated quantities to maintain water quality at wholesome parameters.

c) Why was chlorine dioxide used in the cleaning regime. IMT bundle, document 30.

A I was not involved in the decision making process to include Chlorine dioxide as part of the cleaning regime, this was led by Ian Powrie.

102. Who was responsible for the effective management of and installation of the point of use filters?

A I believe this was the contractor DMA Canyon managed by Ian Powrie.

103. How often were you aware of the filters being changed? Were the manufacturer's recommendations followed?

A I recall frequency of change being by monthly and monthly depending on the rated filter installed.

104. How involved were you in decisions relating to water testing?

A Please see answer 101 a.

105. If not, who was responsible for these?

A Ian Powrie

106. What do you understand about management of water testing? What do you understand about decisions on when water testing should be undertaken?

A I understand water testing is a legal requirement and is outlined in hospital guidance SHTM0401.

107. In her statement Dr Teresa Inkster states *'there was a direction from Mary Anne Kane, who was at senior director level, not to give microbiologists access to water testing results'*:

a) What is your reaction to this statement?

A I have not seen this statement however it is my believe that all information should be shared between parties especially when it concerns patient care.

b) Why did estates direct that microbiologists should not have access to water testing results?

A I don't know.

c) Have you ever been advised not to contact someone/ not to provide water testing information? If so, when? By whom? and why?

A No

d) Have you ever refused, or directed others to refuse to provide water testing information requested by microbiologists or infection control? If so, why? Provide as much information for your rationale and the consequences of withholding information.

A No

e) Provide information on how you dealt with requests for water testing results from microbiologists and infection control - was all the information requested provided? If so, what was provided? If not, why was paperwork not provided?

A Any requests I ever received for information at the QEUH for any building services were passed to my line manager for approval.

f) Who was responsible for dealing with these requests for information?

A I don't know.

g) What was your role in dealing with these requests for information?

A I did not have a role in dealing with requests for information regarding water.

h) How were these requests for information managed by your department? What steps did you take?

A Please see A-107 e

i) What concerns, if any, did you have with how matters were being handled? If so, what steps did you take in response to these concerns?

A I was not involved in how these matters were handled.

DMA Canyon Reports

Refer to Bundle 6 – Miscellaneous documents – documents 29 and 30.

108. How many times did DMA Canyon mention the report during their time on site between 2015 and 2018? If so, when and what was mentioned?

A The only time I personally dealt with DMA Canyon was to facilitate their access to site to carry out pre determined work by others, or pass their findings onto the relevant person of their charge should they not be able to liaise with that individual on their day of visit, which was rare.

Taps

109. The use of Horne Taps was discussed in the IMTs relative to the water incident. IMT Bundle.
Please confirm:

a) Your understanding of use of Horne taps.

A My understanding of Horne taps is limited to my awareness that they have been previously installed within hospital settings as a result of historical design and component selection.

b) Who authorised the use of Horne taps?

A I don’t know.

c) Why were Horne taps selected?

A I don’t know.

d) How involved were you in the decision to use Horne Taps – NSS SBAR Bundle, document 1 - please discuss your involvement and understanding.

A I had no involvement in this matter.

e) What is your recollection of the views about the use of Horne taps – please explain your recollection of the use of Horne taps.

A My only recollection after reviewing document 1 is that there was an appetite to remove them because of the Infection control risks they presented.

f) At the time, were you aware of the incidents in Northern Ireland with Horne Taps?

A No.

Water Technical Group

110. The water technical group (WTG) sat between 2018 and 2019. Estates Communication Bundle, document 133:

a) What is the purpose of WTG?

A I had no involvement in the water technical group.

b) Who was in the WTG, what were their names and their roles within WTG?

A To my knowledge : Ian Powrie, Andy Wilson, Colin Purdon, Mel MacMillan, Dennis Kelly(AE Water)

c) Why was the WTG set up?

A I believe it was to promote and manage water safety within the QEUH Campus.

d) What qualifications were required in order to be chair of WTG?

A I don’t know.

e) Refer to IMT Bundle documents 39 onward, and any other IMTs as a result of WTG. Go through and discuss issues – impact of patients – what was cause of these issues.

A I was asked to attend this IMT 3rd July 2019 as estates representative in the absence of my colleagues who manage water where I received an action to contact the company that carries out the water testing to make sure that their sequence of obtaining the water samples was correct and no cross contamination had occurred in their results.

f) Did you follow through with this action? If so, what happened following your involvement?

A I would have responded to the IMT action with a simple email or conversation. Following the IMT my action was to confirm that the sequence for obtaining the water samples was correct. The IMT discussion was around whether there could be contamination from touching taps and other areas within the room while obtaining the water sample. It's my understanding the IMT where looking to confirm the water sampling process would not compromise the results of the water testing. I believe that I informed Colin Purdon following the response – he normally attended either him or Andy Wilson. I can't recall if I reported the response to them or IMT directly, but I always carried out every action that I was given following an IMT. I can't now recall if it was an email that I sent or a phone call but I would have followed it up.

Other water incidents

111. What other specific events do you recall in relation to water? Do you have any recollection of debris in the water tanks, if so, please explain:

a) What the issue was;

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved;

d) What was escalation process;

e) Were any external organisations approached to support and advise;

f) Detail role and function of HPS and HFS, advise if they were involved and any reports prepared by them;

g) Detail advice given from external organisations; what was the advice, did you agree with it, how was any advice managed/ communicated with others in your team and your superiors?;

h) Was there opposing advice and by whom;

i) What remedial action was decided on and who made the decision;

j) Was the issue resolved – consider any ongoing aftercare/support/monitoring;

k) Detail any ongoing concerns you had, or which you were made aware of;

l) Was there any documentation referenced during or created after the event? i.e. an SBAR/ minutes from a meeting – use the bundle provided to assist.

m) Did anyone sign off to say the work had been completed and issue resolved/area safe?

A I was not involved with the management of water at the QEUH nor was I trained or appointed to carry out these duties.

112. What were the NHS procedures for raising concerns about water or water infections.

a) How were these dealt with by you?

A If concerns were ever raised to me regarding water issues I would escalate them to Colin Purdon so they could be allocated to the correct personnel and addressed accordingly.

b) How was it confirmed they had been dealt with.

A I don't know.

c) Do you recall specific ones and in particular any that gave you concern.

A No.

<u>Ventilation - Commissioning and Validation</u>

113. Describe the commissioning and validation process in respect of the ventilation system in the QEUH/RHC.

A I was not involved in the commissioning and validation of the ventilation systems at building handover.

a) Who was this carried out by?

A The commissioning would have been carried out by Brookfield Multiplex subcontractors Mercury Engineering, Schneider controls, & H&V Commissioning, to my knowledge the systems were not validated.

b) Who signed off?

A I don't know this would have been the responsibility of the project team and the nominated stakeholders for acceptance.

c) To what extent, if any, did infection control have input prior to sign off? Refer to Estates Communication Bundle, document 22. For reference in this email Christine Peter's states that Craig (Williams) has not seen anything in writing about the ventilation.

A I do not know what input Infection Control had with respect to sign off, this would be for them and the project team to advise.

(i) If so, who?

A Please see A-113c

(ii) When should this have been done?

A On client acceptance and prior to patient occupancy.

(iii) Were you involved?

A No.

d) Were you aware of any concerns raised at any point about the ventilation system and its commissioning?

A When I took over the management of the ventilation systems at the QEUH in March/April 2018, part of my initial assessment was to consolidate an accurate documentation inventory for all ventilation assets at the QEUH, it was at this point I found no Validation information for the ventilation systems was available.

e) In your opinion, had validation of the ventilation system been carried out prior to handover? If not, what is the potential consequence of this having not been done?

A In my opinion no, from what I learned. It is important to say that when people talk about validation and verification they get the two mixed up; validation is a

first pass of acceptance following on from commissioning. When I took over management of the ventilation system I had to ensure that we kept going what was up and running from pervious maintenance strategy. I also tried to get a complete asset register for the whole campus. I wanted detailed list to enable us to target maintenance to ensure compliance. Alternate critical assets had to be planned and scaled in. The theatre assets register was up and running, as it had to be in order to comply with SHTM, which included annual testing of the isolation rooms.

It was a big learning curve for me, I was not Authorised Person for ventilation at the time, my role was in management of the ventilation system then. The review carried out on pervious information regarding validation was part of the initiative and it involved looking at available commissioning information. During that process that I could say with relative certainty that I did not see validation information prior to handover. As for the consequence of not doing this, speaking from what I know today, if you don't validate the ventilation system you have no idea if fit for purpose for clinical prupose designed for, or the purpose it was designed and commissioned for at handover, or if it was clearly laid out within design standards. Commissioning is a measurement of what the design was intended to achieve, so of the design says X and the measurement says X the system would meet the design. Validation means 'does it work for clinical requirements and guidance?' there are various examples for theatre. If the system wasn't validated I don't know how anyone would know it was doing what intended to do.

f) What commissioning and validation documentation prior to handover in 2015?

A No

(i) If not, who would have seen commission and validation documentation?

A No this information would have been provided by Brookfield Multiplex and any appointed independent validator for the project teams review and acceptance.

g) What is your understanding of the SHTM guidance in respect of ventilation?

A SHTM-03-01 Parts A&B is Guidance for the concept, design, specification, installation and acceptance testing of healthcare ventilation systems and the management, operation, maintenance and routine testing of existing healthcare ventilation systems.

h) How important is SHTM guidance in respect of ventilation?

A SHTM guidance is fundamental guidance with respect to the design, build and maintenance of healthcare ventilation systems.

i) What emphasis, if any, is there on patient safety in SHTM guidance in relation to ventilation?

A To answer fully I would need to conduct a search of the guidance. But in summary, the documents' purpose is to support patient safety outlining the design, specification, installation and acceptance testing, management, operation, maintenance and routine testing of healthcare ventilation systems to support patient safety, which is at the forefront of the guidance.

i) Was the QEUH/ RHC ventilation system SHTM compliant at the date of handover – if not, what was outstanding? Who was responsible to ensure that the ventilation system complied with SHTM?

A It is the responsibility of NHSGG&Cs project team to ensure all ventilation systems complied with the technical memorandum at the date of handover.

j) Refer Estates Communication Bundle, documents 34, 34.1, 34.2:

i) can you explain the content of this email

A Yes this is an email from Ian Powrie to Craig Williams sharing information provided by Brookfield Multiplex containing a copy of a schedule of isolation rooms and the system commissioning data and schematics forward 4B

ii) please see the documents attached to the email – what are these documents and have you seen them before?

A These documents are a copy of a schedule of isolation rooms and the system commissioning data and schematics for ward 4B, I believe I have seen them before during my time managing the ventilation systems at the QEUH and planning the annual ventilation verification of the ward.

iii) what does this relate to?

A The commissioning information relates to specific recorded data at the time of commissioning such as grill terminal numbers, associated design and measured flow rates and % flow rate measured against intended design flowrate comparison, motor full load and running currents recorded at time of commissioning.

iv) why was Professor Williams asking for this information?

A From reading the email trail I believe Professor Williams is attempting to seek assurance from stakeholders that the specification provides a safe environment for patients.

v) when did Professor Williams ask for this information?

A His email is dated the 7th of July 2015.

vi) When was this information provided to Professor Williams?

A In reading the email trail it looks like this information was provided the same day by Ian Powrie.

k) Discuss the concerns about Ward 4B. Refer Estate Communication Bundle, document 30 - What was the purpose of the SBAR?
Refer to Estates Communication Bundle, documents 30, 31, 32 to assist with your answer.

A Having read document 30 it states that based on the analysis conducted against Nice guidelines the QEUH is not fit for purpose for Haematoncology

patients to remain safely, I believe the purpose of the SBAR is to formally record and manage this perceived issue.

l) What involvement, if any did you have in respect of this matter?

A I was not involved, the answer I have provided is only from reading the document for the purposes of answering this questionnaire.

m) How does commissioning differ to validation?

A Commissioning is simply a measurement of system performance against design Validation differs from commissioning in that its purpose is to look at the complete installation from air intake to extract discharge and assess its “fitness for purpose as a whole”. This involves examining the fabric of the building being served by the system and inspecting the ventilation equipment fitted as well as measuring the actual ventilation performance. Validation is not a snagging exercise, Validation is a process of proving that the system in its entirety is fit for purpose and achieves the operating performance originally specified. It will normally be a condition of contract that “The system will be acceptable to the client if at the time of validation, it is considered fit for purpose and will only require routine maintenance in order to remain so for its projected life.”

n) Was there a validation document to accompany this for handover?

A Not to my Knowledge.

o) What is the purpose of Commissioning and Validation (C&V)?

A The purpose of commissioning and validation is to ensure all of the elements work as a whole to achieve the project aim.

p) What are the consequences of it not being carried out? What concerns did you have, if any, that the QEUH/RHC had not been signed off without C&V?

A If C&V is not carried out you have no assurance that the system in question is operating to achieve its design intent under commissioning, and is fit for purpose and compliant with hospital guidance under validation.

q) What concerns, if any, would you have if there were no C&V of the ventilation system?

A I would be concerned that the system is not operating to support its intended ventilation strategy.

r) Why would no C&V of the ventilation system give rise to these specific concerns?

A No C&V of the ventilation system would give rise to these concerns because you would have no way of knowing how the system was performing with respect to Air change rates and measured pressure profiles, therefore you could not ensure that the correct level of air dilution was taking place for the space served from that ventilation system recommended by guidance or that the hierarchy of cleanliness (flow of air from clean to less clean areas with robust authority) was in place to support the control of infection rates in clinical areas.

114. What testing and maintenance protocols and regimes were in place?

A Post handover I believe maintenance protocols and regimes were still being established, I recall the priority was to have an annual verification programme in place for the theatres which was led and created by Ian Powrie and David Brattey, by the end of the first year the annual theatre verification programme was in place for all 43 theatres on campus where by each theatre (Adults & RHC) under went its first annual verification to measure its performance against SHTM-03-01 with any remedial recommendations being actioned as part of the 5 day shut down of the theatre suite. Due to the asset PPMs not being integrated onto FM first (CAFM) ventilation maintenance was created, distributed and logged manually on the system as an interim protocol.

115. Should these protocols have been established and in place prior to patient migration? If so, what was the consequence of this not having been done prior to patient migration?

A I think they should have been in place prior to patient migration. Assuming all due diligence has taken place during the handover period, as that is why it has been handed over. From a ventilation verification perspective you would have one year from the date of handover to re-verify against the original validation, which means check that the entire system functions in the way intended and as it functioned at handover. I think that is why so important the program for the theatres was up and running. The consequence of protocols and a verification programme not being in place prior to patient migration is that you have no sight on what the ventilation strategy in situ is, and whether the system is performing as intended. SHTM-03-01 states verification annually as a requirement. To maintain a suitable patient environment, all stakeholders should have visibility of potential risk factors and be advised of the expected timescales of fixed maintenance and PPM. Hospital air change rates, pressure profiles etc exist because the due diligence and science has been carried out by others with regard to air dilation rates and optimum pressure cascades to support patient environments advising what ventilation standards are required to support clinical service.

116. Refer to Estates Communication Bundle, document 47 page 5/18 of document:
This states that air permeability tests were not carried out to 36 isolation rooms:

a) Were you aware of this? If you were not aware, who would have been aware?

A No, this report was generated prior to me working at the QEUH.

b) What was the consequence of this?

A One consequence can be if room permeability is not confirmed to meet the specified standard, then the space can have too much air leakage, resulting in

more challenging to achieve adequate pressure parameters for the space, hence more primary air is required to achieve a specific pressure profile of the room creating plant inefficiency and potential difficulty in validating the system in which serves it.

c) Why did handover take place in these circumstances?

A I don't know.

d) What happened following this report?

A I don't know.

e) What concerns, if any, did the contents of the report give you? Why did the report give rise to these specific concerns?

A Please see A-116a

Have regard to the following emails when considering your answers to the above Estates Communication Bundle, documents 64, 67 and 68.

117. What concerns, if any, did you have about the ventilation system at the point of patient migration to QEUH?

A I was not involved.

118. Where was the documentation for C&V stored at that time?

A I was not involved.

119. Have you seen the ventilation system validation documentation as at handover (Jan 2015)?

a) If yes – who carried this out, who signed off, who authorised?

A No.

b) If no – should you not have sought this? Who is responsible for ensuring it is in place? Who should have chased this up? Would this not be part of ID remit?

A At handover it is the responsibility of the project team to ensure this is in place prior to acceptance, I was not involved in ventilation maintenance at this time.

120. Where would the paperwork have been stored/ Who would have been responsible for it?

A I don't know, this would have been the responsibility of the project team.

121. If validation was not in place at handover, how did the hospital open? Who would have had the authority to allow the hospital to open without validation in place?

A I don't know, this would have been the responsibility of the project team.

122. Were you asked by microbiologists or Infection Control to provide information regarding the ventilation system and validation? Refer to Estates Communication Bundle, document 27. Who was supposed to provide this information? If it was not provided, why not? What action was taken to ensure that information was provided – if it was not, what was done to escalate this? Who was responsible for providing this information?

A Document 27 indicates that Ian Powrie was requested to provide this information.

<u>Ventilation system – general</u>

123. What testing and maintenance protocols and regimes were in place? Refer to Estates Bundle, document 62.

A These are H&V commissioning reports with regard to Ward 4B in October 2015. I was not involved in establishing the testing and maintenance protocols and regimes on Estates receipt of this information.

124. What concerns, if any, do you have relating to the ventilation? What concerns, if any, do you have relating to the water temperature? What concerns, if any,

do you have relating to the movement within the water system? Refer to Estates Communication Bundle, document 123.

A Regarding ventilation at the QEUH and the experience I have gained while involved in its maintenance, my concerns were from an engineering compliance perspective in that any ventilation system that does not meet the minimum standards set out within the technical memorandum regarding air change rates, associated space pressure profiles and rating of filtration, any consequences for maintenance etc. I am not qualified to comment on the risk of shortfalls as I have no visibility or understanding of potential associated infection rates, this would be for the Health Boards Infection Prevention and control team to risk assess and quantify.

125. Was it possible to incorporate a comprehensive ventilation system into the QEUH/RHC?

A Without being involved in the design process required to model and calculate what this requirement would be, I don't know.

126. Describe any ward/area specific ventilation systems used?

A I recall ward 6A was served by three shared AHUs located on level 12 plantrooms that also served levels 4,5 &7 for Tower (A) originally inclusive of G4 pre filtration and F7 secondary filtration that where later upgraded to incorparate F9 secondary filtration. I believe these AHUs included the use of thermal wheel technology as a mode of thermal heat recovery.

127. What are your thoughts about these ventilation systems that were used?

A It is my understanding that ward 6A was classed as a general ward prior to being utilised as a decant solution for RHC ward 2A. The ventilation requirement for a general ward in accordance with guidance available at the time of construction SHTM-03-01 Part A 2014 recommended an ACH rate of 6 per hour and 0 to -VE pressure from the room to corridor for a single room, within ward 6A this was found not to be achieved as a result of under rated system capacity. SHTM 03-01 also outlined for a Neutropenic patient

ward,10 ACHs and 10 pascals positive pressure from room to corridor was required. I believe the patient classification from the patient cohort from ward 2A was classed as Neutropenic. In both instances my thoughts are that the principal ventilation performance is not in accordance with the recommendations within guidance at this time.

128. Refer to Estates Communication Bundle, document 136. Explain the concerns regarding laten defects and actions taken.

A From reading this bundle the concerns relate to ventilation, potable water and derogations relating to ward 2A Schiehallion. Paragraphs 2 & 3 on page 953 section (d) within the bundle relate to a design proposal intended to comply with BREEAM and a concern is raised about the proposal's suitability and consideration for Haematoncology and neutropenic specialist areas. I believe this may have been a contributing factor in deciding the commencement of ward refurbishment upgrades.

127. What involvement, if any, did you have in respect of this matter?

A I was not involved, the answer I have provided to the above question is just from reading the documents for the purposes of engaging with this questionnaire.

<u>Specific events in relation to ventilation system</u>

128. Can you recall any specific events, if so, describe your involvement, action taken and any concerns you had at the time?

A I consider that I have already spoken to this in my evidence. A couple of key issues come to mind, certainly I had advised within the decant of Ward 2A to 6A. Once I took over management of the ventilation systems there was more of an appetite to understand general ventilation systems that were not verified and only had original commissioning information on ZUTEC available associated with their recorded performance. In my experience there became a clinical and estates appetite from my line managers to be able to feedback what

pre-existing ventilation strategies were for example Ward 6A; what was it, how it was designed, commissioned, what restrictions there are, was it maintained as a critical or general ventilation system, what improvements could be made, how can they be improved and how can risks be mitigated within the parameters of the building. I had a lot of involvement in doing the option appraisals for Ward 6A and I did an option appraisal of Ward 4C. Those tasks assigned to me by Alan Gallacher and Tom Steele were to provide a line in the sand of pressure profiles for the rooms and what the pre-existing air change rates were for those rooms. This is not something you would generally have for a non-critical ventilation system. The report that was generated for this work had technical information but also schematical diagram information for people not necessarily mechanically trained so people could understand flow of air from clean to less clean areas, the hierarchy of cleanliness. That information would be reviewed by other line managers, IMT, and they would decide and have visibility of how the ward was being used, what it's intended service application was and the ideal ventilation strategy to support this. My actions would be say for Ward 4C; to scan the whole ward; as expected pressure profiles were either zero or negative, the appetite was to have mostly positive room pressure profiles hence conduct a rebalancing exercise to try and make patient rooms marginally positive pressure to the corridor. This was achieved by layout review of the system by our specialist contractor and subsequent system rebalancing to ensure any rooms that were negative from corridor to room were rebalanced to make them notionally positive from room to corridor. I provided options appraisals for my line managers consideration and review to try and optimise the ventilation strategy to suit the clinical environment with the understanding that it did not meet the outgoing guidance standards for that of a general or immune compromised setting.

Isolation Rooms

129. What was the issued referred to in the email at Estates Communication Bundle, document 34? How did this happen?

A Having reviewed the bundle document 34 I believe the issue was Brookfield not carrying out DOP testing for HEPA filter challenge tests.

130. Discuss the air permeability testing carried out in respect of the isolation rooms Estates Communication Bundle, documents 37 & 41:

a) Why was this work carried out?

A This is a requirement of SHPN-04-01.

b) What was the result of this work?

A The results are not clear to me from the email trail.

c) what was your involvement in the work?

A I was not involved.

131. Refer to Estates Communication Bundle, document 26 Christine Peters refers to sealing light fittings:

a) What was the issue?

A The issue reads to be gaps between the light fittings and ceiling presenting a permeability risk within the fabric.

b) What was the potential impact on patients?

A I don't know, however a breach in fabric can cause difficulties in achieving the required pressure profile for the room.

132. Dr Christine Peters tell us that she raised issues with you regarding the accommodation of an immune suppressed patient on 16th July 2019. She tells us that

'The patient was being nursed in a negative pressure room that did not have a HEPA supply. They were then moved to a PPVL room without a HEPA supply. There was clearly confusion regarding correct placement and the PPVL room had a pressure of 20 pascals which was out of specification. I raised this with the Estates team and in particular, Darryl Conner'

Discuss these issues with reference to the Estates Communication Bundle, document 140:

a) Your understanding and involvement

A I would normally have followed up such a request in writing. My email response is not included in the email exchange. Due to the passage of time I cannot recall Dr Christine Peters raising these concerns, however my role would have been to provide any information available or by further investigation on the pre existing ventilation strategy and levels of filtration in place on request.

b) work carried out

A I do not recall.

c) Potential patient impact

A I don't know.

133. Any other matters relating to isolation rooms that you wish to add comment on:

A Not all isolation rooms at the QEUH where fitted with terminal Hepa Filtration, this was a clinical and IPC selection process pre hand over that I was not involved in.

134. What action, if any, do you recall being taken in response to this? Describe your involvement, if any?

A I had involvement in a sense; the placement of patients and use of facilities sits firmly with clinicians and IPC teams, they are suitably trained and they provide patient care and how they the facilities and services sits with them. My role when I was in managing ventilation, was to provide with them as much information about what they had, bearing in mind that things were changing, and I was not aware of their previous understanding. That is why I don't remember that particular event, as there is not a specific isolation room referred to. Fundamentally, I would have responded back by phone call or email to

investigate. For example, if a room was out of pressure, I would look at controls, the PMS, look at plant, is it out of parameter, investigate, check verification documents.

As far as HEPAs are concerned, I don't know what the rational is between PPVL across campus and not having all them with terminal HEPA filtration, but do believe SHTM 04-01 supplement 1 states that there should be facility to include at a later date if required, so the request to install HEPA would have to come from there, and if that was a request I would have facilitated it by challenge testing, rebalancing the system, producing a report. In today's age you have Ventilation Safety Group, so now stakeholders, CIP, clinical representation, operational estates etc share a common table to discuss these issues on a regular basis, but that type of information at the time would have been communicated to the stakeholders.

Ward 4B

135. What was the intended purpose of Ward 4B?

A I understand the purpose of Ward 4B is to provide a safe environment for the treatment and care of adult Bone Marro Transplant Patients (BMT)

136. Did this change prior to January 2015? If so, what changes were made?

A I don't know, the project team would be best to advise.

137. What, if any, changes were required to the ventilation system? Why were they made?

A Ward 4B is not served from the general tower AHUs located on level 12 of the QEUH, they are instead served by dedicated AHU located on level 3 Plant room 31 to provide a dedicated ventilation strategy to support the ward and the clinical processes that take place, I believe this is one of the changes that where carried out at the very early stages of handover managed by Ian Powrie.

138. How involved were you with the changes?

A I was not involved.

139. Refer to Estates Communication Bundle document 62:

a) What is this document?

A This is a ventilation report for ward 4B outlining the commission values of AHU 31-63.

b) Have you seen it before? If so, when?

A I believe I would have as I have organised ventilation verification of ward 4B in my past role as Authorised Person.

c) What was the purpose of carrying out a ventilation report in October 2015?

A To compared how the measured commissioning values compare to that of the design.

d) Did any issues arise from this report?

A I was not involved in the review or acceptance of this report.

e) How involved were you?

A I was not involved.

f) Was this not within your role as Authorised Person? If not, who would have been responsible for action this report? What concerns, if any, did you have regarding the 2015 ventilation report?

A I became Authorised Person for ventilation around January/ February 2019, this was prior to my being appointed.

g) What matters, if any, did you escalate arising from this report? If so, to whom and why?

A I was not involved.

Decision to close wards 2A/B and move to 6A and 4B

140. Discuss the issues surrounding and leading up to the decant of patients from Ward 2A in 2018.

a) What was the lead up and background to this refer to Estates Communication Bundle, document 133.

A I was not involved in the decision to close wards 2A/B and move to 6A and 4B.

b) What was your involvement.

A My only involvement was to ensure that all AHU plant serving ward 6A was checked and serviced at the request of Andy Wilson in preparation of the move.

c) What risk assessment and additional measures were put in place to ensure patient safety?

A I recall a hive of estates activity in ward 6A at that time inclusive of fabric repairs, plant servicing, lighting and nurse call checks, installation of point of use filters in readiness for this move.

d) Do you recall risk assessments being carried out, if so by whom?

A Andrew Wilson would have been involved in decision making. Andrew Wilson asked find out what ventilation plant was serving Ward 6A and to make sure what ventilation was serving 6A make sure all serviced.

e) Did you have concerns about ventilation in Ward 6A being suitable for patients from Ward 2A?

A Yes, I always knew that Ward 2A was BMT, TCT, haemato-oncology ward, so very a specific ward for immune compromised patients, and I knew that the majority of wards in the adult hospital were tower wards or as you would say general wards from shared ventilation. I had personal concerns, but the risk

assessment piece and all the other moving parts, and the people involved, took into account other variables beyond what I was privy to in order to make that decision. My role was to make sure that the plant which served Ward 6A was in a suitable state, which it was, and that was documented. The Estates team knew Ward 6 A was general ward type, but that was being assessed through I would imagine an IMT, whoever the body of people would have been they would have assessed that. I wasn't involved risk assessment. I don't know if one was carried out. I would imagine there would have been, there certainly should have been.

f) What concerns, if any, did you have about where the patient cohort was being moved to?, If so, why did you have these concerns? IMT Bundle, document 39 you flagged concerns, were these ever followed up? Did you escalate these concerns? With the benefit of hindsight, what steps could have been taken to progress this matter further?

A I did not flag any concerns within IMT Bundle, document 39, this risk assessment and IMT was conducted by others.

g) Discuss and detail the works done to Ward 2A/B what was required to be done and why, what has been done and when the work was completed. Please include details of your involvement. Reference IMT Bundle to assist.

A Works were highlighted to be carried out for Wards 2A & 2B because of various surveyed non compliances that resulted in the discussed patient decant. The project works where comprehensive and are well detailed within capital planning contract record. With regard to ventilation within these spaces a complete plant replacement of all systems was to be carried out in order to address ventilation non compliances in order to facilitate a dedicated plant allocation to serve various types and styles of isolation rooms from Positive Pressure Lobby (PPL) to Positive pressure Isolation room (PPIR) Negative pressure Isolation room (NPIR) and BMT corridors to support patient pathway and movement. My involvement was to review capital design proposals from an operational estates perspective and provide my feedback and observations

of the proposed design intent. I had expressed my concerns around the new proposed design to the assistant director of estates and facilities Gerry Cox, who asked me to re write what I thought the client ventilation specification should include for Ward 2A taking into account existing guidance, good industry standards and the intended clinical application for the ward. I created and delivered this client specification for Gerry Cox and Alan Gallager including what I believed the brief should have been for this ward and attached a Version tracker to it as V2 after the initial V1 created by Ian Powrie. I believe after this submission and through the duration of the refurbishment various versions succeeded mine during its construction commissioning and handover. I left GG&C estates in July 2020 to work with NHS Scotland Assure prior to the project being completed and handed over.

h) Describe your concerns around the new proposed design?

A There was the Innovated Design Solutions report which outlined all the pre-existing shortfalls and compliance with guidance, but whatever the driver was to carry out the works to Ward 2A, I recall discussions with Ian Powrie and other designers, being an estates manger, I got to sit in on these discussions. As my role developed and the project progressed, I had sight of the design progress and review of certain aspects, as ultimately estates would inherit this as an estate's maintenance asset. I remember continuously going to meetings and hearing concepts that I knew to be to a non-compliant standard, so I regularly voiced opinion about what standards were and why certain things weren't being included within the design. I recall at one point the assistant director for estates and facilities Gerry Cox saying, 'Darryl would you be able write a client brief of what you think the design intention should be'. I have discussed this above in my answer. I brought in Authorised Person for ventilation at time Jim Guthrie, specialist contractors and other engineer for ventilation. I had idea of what was proposed and what the demographic of the ward was to be, an awareness of current guidance and what interim guidance soon to be release from HFS, I derived what I believed the ventilation strategy for the ward 2A rooms should

be. I did a report tracked as Version 2, Version 1 was by Tersea Inkster/ Ian Powrie. As per my earlier answer prior to the work being completed.

My concerns were surrounding what I perceived to be the non-compliance aspects of the existing design proposal. The original concept was to upgrade TCT part to provide suitable air change rates and pressure profiles to support the intended patient group, and at this stage it was looking like TCT and haemato-oncology rooms wards be of a higher standard than BMT ward. It was all about ensuring that we had dedicated plant for each of the isolation rooms, dedicated plant that if a corridor was to be of a neutropenic standard in a patient pathway that it should be of a higher standard; 10ACH, 10 pascals and it should be a of lesser level to that what the rooms where to be as identified as being of a higher level of cleanliness.

i) Were your concerns listen to and take on board?

A I believe they were, however as the project progressed my understanding was that different versions of the brief were agreed to fit project requirements agreed by James Huddleson of capital planning and his team. I left GG&C to work for NHS Scotland Assure over a year before project completion therefore was not involved In the handover and acceptance of this facility.

j) Are you aware of what the current ventilation specification is?

A I don’t know what the final specification ended up being, I would presume that the TCT patient rooms will have at least have 10ACH , with corridor ACH rates of 10 ACH and a positive pressure of 10 pa to less clean areas. My understanding is that the BMT side of Ward 2A probably now includes 4 BMT isolation rooms, 3 PPVL Isolation rooms and perhaps a negative pressure room (but I don’t know whether this was done in the end), and a MGBT room at bottom of wards which dealt with radiation therapy for cancer treatment all served by dedicated ventilation plant and suitable HEPA filtration. I don’t know what the finalised agreed design was, how it was completed and how it was validated, but I do know that it was a long design and construction period at

significant expense, and is likely a fantastic provision against its previous standard prior to its refurbishment.

141. Discuss the issues surrounding the ward 2A patients when in occupation of ward 6A. In particular, views you may have in respect of:

a) Chilled beams;

b) Gram Negative Bacteraemia

c) Water filters

d) Ventilation

e) issues/ testing/ escalation/ response/ IMTs/SBARs impact on patients

f) Patient communication

g) Internal escalation - HAIIT scoring

h) External escalation

A Views I have on the use of chilled beams within a clinical setting is that they are not recommended for use because of their risk of system leakage, risk of condensation under certain conditions, their restriction of air flow to support higher air change rates and the increased maintenance requirements due to the need for regular cleaning if they are to remain working efficiently. The current out going version of SHTM-03-01 advises “Chilled beams should not be installed in clinical areas without the agreement in writing of the VSG”.In regard to ventilation for the occupancy of ward 6A, the standard for ventilation to be delivered for a neutropenic area is as follows : the 2014 standard notes a room requirement for 10ACH, +10Pa (within Table A1), however does not necessarily differentiate between the patient bedroom area and corridor in the same way the 2022 now does (i.e. the 2022 standards clarifies the hierarchy of cleanliness as +15Pa in the patient bedroom, with the adjacent corridor at +10Pa relative to other adjacencies) Ward 6A was a general ward served by shared ventilation with sub optimal Air change rates required for a general ward (6 ACHs per hour) anything less than the current standard recommended raises concerns around infection rates. Mitigating measures to reduce this short fall where implemented for the duration of the decant to reduce this risk within the fixed as built parameters of ward 6A such as plant

rebalancing to optimise air flow and moderately increase ACH rates where possible, upgrading of source AHU filtration from F7 standard to F9, system rebalancing to provide a notional positive pressure cascade from patient rooms to corridor, installation of fixed ensuite Heppa filters to reduce the levels of particulate in secondary air within the patient rooms and ensuites.

Reports prepared by Innovated Design Solutions October 2018

142. Refer to Bundle 6 – Miscellaneous Documents – Documents 33 and 34. These documents are feasibility studies regarding increasing ventilation air change rates within Wards 2A and 2B by Innovated Design Solutions.

a) Who commissioned these reports?

A I believe it was Alan Gallagher that commissioned these reports from INNOVATED DESIGN SOLUTIONS.

b) What was the background to these reports being commissioned?

A I believe the health board wanted to survey the possibility of increasing ACH rates within these areas and gain an overview of the pre existing ventilation strategy.

c) Why were these reports commissioned? What issues prompted the instruction of these reports?

A Please see A- 151b

d) What concerns, if any, did you have regarding the ventilation system in Ward 2A?

A I did not have concerns up until this point as previous limited ventilation verifications had been carried out by other colleagues and no outstanding concerns where evident to me other than not all the ventilations systems had undergone annual verification due to challenges in access and continuity of service.

e) When did these concerns arise? Was anyone else in estates concerned? Why?

A I believe the concerns were raised off the back of these reports as a result of ongoing suspected hospital acquired infections.

f) What was the impact on patients?

A This would be for clinical and IPC teams to advise but ultimately the patients were decanted to different locations to facilitate the refurbishment works.

g) What concerns were raised with anyone?

A I don’t know, Alan Gallager would be best to advise.

h) What concerns, if any, did you have regarding the ventilation system in Ward 2B?

A At the time, I did not have any concerns around ward 2B as my understanding was it was an outpatient ward.

i) When did these concerns arise? Was anyone else in estates concerned? Why?

A I believe it would have been the suitability of the ward environment for this patient group.

j) What was the impact on patients?

A Please see Answer-f

k) What concerns were raised with anyone?

A My understanding is that all concerns were discussed and raised by the IMT stakeholders involved with the incident.

l) What happened in response to these reports?

A Early design meetings were called between the capital planning and estates teams to review non compliances and refurbishment design considerations.

m) What matters were escalated arising from these reports? If so, to whom, and if not, why not?

A I don't know.

n) What works, if any, were carried out in response to any findings in these reports?

A A full refurbishment of ward 2A & 2B was carried out.

Cryptococcus

Refer to the Cryptococcus Bundle to assist.

143. Recall your understanding of the Cryptococcus infections in 2018:

a) What is Cryptococcus?

A My understanding of Cryptococcus is a fungi that can lead to an infection in patients with comprised immune systems. Its origin in my experience has been reported to spawn from spores of dry pigeon guano atomised within the air and breathed in by an individual/patient.

b) Describe concerns, if any, you had in respect of pigeons at QUEH/RHC? If you had concerns when did these concerns initially arise, and for how long/ how often did such concerns arise?

A I did not have any concerns about pigeons. I had not heard about Cryptococcus previously. I had no concerns, there had been occasions when other colleagues have reported to the company GP Environmental Ltd such as breaches in fabric, cleaning up mess of a similar nature. As a result areas of concern would have pigeon netting installed to keep the pigeons out and cleaning of any mess if required. We had H&V Commissioning in doing

balancing works and I recall a member of H&V Commissioning staff sent me a couple of pictures of a dead bird. I delegated this to an estates supervisor Frank Green to contact GP Environmental Ltd to come in and clean accordingly. Approximately one to one and a half weeks later Ian Powrie came and advised me about the incidents and informed me that we had to assess the plantrooms. I think I went that night to level 12 with a drawing of the plant rooms and marked all the areas with pigeon droppings on the drawings.

c) Describe your involvement, if any, in respect of pest control management in relation to pigeons at QEUH/RHC? Describe your involvement, if any, in respect of instructing works to be carried out in respect of pigeons at QEUH/RHC?

A I could count on one hand on the occasions when I personally called out GP Environmental Ltd. I would not normally deal with this, it would come through FM First and would be distributed by supervisors. To that extent I did deal with it a lot when I was supervisor at the Western Infirmary.

d) Had you seen/ heard of Cryptococcus in a healthcare setting prior to QEUH.

A No.

e) What were the issues with Cryptococcus at QEUH? When did you first become aware of these issues? What concerns, if any, did you have surrounding Cryptococcus? Had you seen anything that caused you concern? What happened in response to these issues?

A I was informed by Ian Powrie in [redacted]2018 that a patient had passed away and it was suspected that Cryptococcus was one hypothesis of the cause. I had never heard of this infection before and knew nothing of its cause or management. I was instructed to survey all plant rooms on level 12 plantrooms for bird droppings and marked a large plantroom layout drawing of all areas where I could visually see it, I signed and dated the drawing and passed for Ian's review the following morning. An IMT was formed quickly after this inclusive of clinical,IPC,estates and specialist stakeholders to review

the issue and to generate areas of hypothetical cause that where to be investigated and reviewed by the group in order to implement the necessary control measures to reduce the perceived risks. A significant action plan was generated by the IMT that included actions for estates including a full clean of all plantrooms within the hospital starting with the plantrooms on level 12, A collation of pictures and photography demonstrate areas of concern and cleaning progress provided by GP environmental. Inspection and repair of any holes or breaches within the plantroom fabric of level 12, a full collation of all maintenance records, layout drawings and survey of associated ACH rates and pressure cascades was requested to support an ongoing investigation lead by John Hood. Prompt servicing of level 12 AHUs in question including filter upgrades from f7 to F9 and a AHU filter frame inspection carried out in the presence of John Hood.

f) Describe your involvement, if any, in air sampling from the plantrooms. When was this carried out? Why was this carried out? Was this routine carried out prior to December 2018, if not, why not? Describe any concerns you had in respect of the air sampling results from December 2018, or at any other time?

A I was not involved in air sampling. I am not a microbiologist, but I did help John Hood and his team by facilitating access. I would have no way to understand the air sampling results from 2018.

g) Describe your involvement, if any, with cleaning of the plant rooms at any time but in particular, in early 2019. Including instructing cleaning to be carried out, to whom, why and when? Was the cleaning more specifically done in 2019?

A Colin Purdon and a person called Alan GP Environmental, were involved in cleaning of all plantrooms in QEUH. It was more specifically done in 2019, the level of cleaning whole campus certainly was reactive. There were protocols for plant room inspections and CAFM and dedicated personal in estates to carry out operatives, and estates would have carried out PPM, but certainly the level of cleaning carried out increased, there was a large number of

personnel, over long period of time carrying out the cleaning, to the extent that the plantrooms were immaculate afterwards.

h) If cleaning was carried out, why was it carried out?

A Certainly, it was needed for plantroom 123 where the main level of pigeon ingress was observed. That was the biggest concentration of droppings and needed specialist contractor, protocols and PPE etc. I think the cleaning was a belt and braces approach, in that it was thought, if this is a potential risk hypothetically it was diligent to carry the cleaning to other areas.

Refer to document from GP Environmental Ltd dated 8th January 2019:

144. What concerns, if any, did you have on reading that there was *'a very large population of feral pigeons present at various locations…*'

A This document was addressed to Karen Connelly, I don't recall having read it however its content supports the response carried out by GP Environmental at that time.

145. What concerns, if any, at the time did you have about the *'Significant Health and Safety Issue'* what further action was taken, was this escalated? If so to whom? Were HPS/ HFS involved? If not, why not? What concerns, if any, in this regard do you have now?

A I recall being concerned about the incident as a whole and wanted to provide assistance where I could contribute to assist in providing assurance that what could be done from an estate's perspective was being done.

146. What action, if any, was taken follow receipt of this document from GP Environmental Ltd?

A I don't know, Karen Connelly to advise.

147. What methods of cleaning were used by GP Environmental Ltd and why? Did this resolve the issue(s)?

A I recall the supervisor from GP Environmental (ALAN) explaining that they douse the droppings in a chemical which neutralises the bird droppings in readiness for clean-up. I can advise that risk assessments and method statements where likely submitted prior to any works commencing, I don't recall reviewing these RAMS personally.

148. Were GP Environmental Ltd instructed previously in respect of pigeons at QEUH/RHC, if so when, and by whom?

A I believe David Bratty had instructed their services previously for attendance to deal with issues in plant room 41 of the RHC hospital.

149. Describe the repair works to 'holes or breaches in the plantroom fabric', why was this carried out? What concerns, if any, were there with holes and breaches in the fabric, how did this relate to the suspected Cryptococcus cases?

A I believe GP environmental made remedial netting repairs to surveyed breaches in the plantroom fabric prior to this being properly addressed by the builder Multiplex at a later date. I believe these breaches in fabric related to the cryptococcus incident as it was considered one of the ways birds were getting into the plantroom and as one Hypothesis at that time was that these droppings may have been a contributing factor to the cause of these cases, this became a point of concern.

150. Why was upgrading filters considered? What other concerns, if any, were there in respect of filters? What further tests, if any, did you carry out in respect of filers and why? To whom, did you report any findings to, and what action, if any, was taken?

A Upgrading of the filters was considered in relation to providing and increased level of filtration to the areas concerned with minimal to no impact on the delivered air flow rates that supported existing air change rates. I believe I contacted our filter manufacturer Camfill to request what filters where available that could potentially support this, I then provided a report by email

to Ian Powrie, Tom Steel & perhaps Colin Purdon outlining the benefits of proposed opak fill F7 &F9 filters in comparison to the pre existing F7 filters in situ with respect to expected levels of increased filtration and clean pressure differential pressures anticipated by the manufacturer, as the clean DP of the F9 opak fills where very similar to that of the F7 bags, not detriment to plant capacity the selection of these filters was approved for installation to selected AHU plant. I believe these where installed the same day the plant was shut down to facilitate the filter frame bypass inspection conducted by myself and Ian Powrie in the presence of DR John Hood.

151. Dr Christine Peters tell us in her statement that you showed her round the plant rooms in the evening? Why did you do this tour in the evening? Were you instructed to give her a tour in the evening, if so, by whom?

A I was asked to show Dr Christine Peters the level 12 plantrooms by Ian Powrie who was also in attendance for the tour, I do not recall this being in the evening and there was no reason that I can recall that the time had to be specific other than this is when Ian Powrie had advised when it was arranged for, presumably to suit the attendance of all individuals.

a) What action, if any, was taken following this tour? Describe any involvement you had.

A I don't know what action was taken as part of this tour; it was my understanding that this tour formed part of the IPC investigative process.

b) In her statement Dr Christine Peters tells us that you were in possession of photos taken pre-clean up, but she did not know this at the time. Did you show these photos to Dr Christine Peters, if so, when? If not, Why not?

A I do not recall showing Dr Christine Peters any photos, all photographs/investigation information taken by myself, other estates colleagues and sub contractors was uploaded and collated onto a folder on the estates shared drive labelled level 12 plantroom investigation, the sharing and distribution of this information was at the discretion of my line managers

Colin Purdon and Ian Powrie on its completion, I was not authorised share this information and was collated for the purpose of the IMT and subsequent John Hood investigation.

c) In her statement Dr Teresa Inkster tells us that you provided an email with a map of the plant room layout with pigeon droppings marked in orange. Do you recall this map? Did you mark on the pigeon droppings in orange? Why did you do this?

A I do recall this layout drawing/map as this was a result of the survey I was asked to carry out previously by Ian Powrie. I highlighted the droppings in orange to make it visibly clear to any perspective reviewer where I had observed them within the plantroom layout drawing. I also signed and dated it.

d) Dr Teresa Inkster tells is in her statement:
'You would expect that when air handling units were opened by Estates that contamination would have occurred then. The reason the location of the pigeon droppings is significant is subsequently there was a suggestion that it had affected one of the plant rooms more than the others. That was not the case. It is very clear from Darryl Conner's markings that it was more extensive'

Do you agree with this comment? What concerns, if any, did you have about the level of pigeon droppings? In how many areas were there dropping? If you had concerns explain why and what the reason for your concerns was.

A I don't agree with this comment. To my knowledge thorough analysis of estates maintenance records carried out by John Hood during his investigation concluded that none of the AHUs that served the patient pathways and timescales of recorded infection where accessed for maintenance during the timescales recorded. Maintenance practices are carried out by " competent persons" who are trained to clean AHU chambers as they work from inside to outside of the AHU removing any debris and dust that may occur as a result of a filter replacement. My understanding from what

I learned during my involvement in the investigation is that bird droppings would have to be dry and be in significant quantities to atomise in the surrounding air. The AHUs on level 12 draw their primary air supply from outside external intake louvres directly into the pre filtration of the AHU, my understanding is this configuration is intended to protect from ingress of internal plantroom conditions. As the AHUs where not accessed for maintenance during the timescales outlined within John Hoods investigation, I would advise that the AHU plant sited at the QEUH are sealed closed units with the majority of the components being under significant positive pressure therefore the drawing in of any external contaminent is highly unlikely. Areas of the AHU that are under negative pressure are connect to the fresh air intakes at high level where no ingress was found to my knowledge.

e) In her statement Dr Teresa Inkster tells us that:
On 20 February 2020, an email was forwarded to me by Dr Hood from Darryl Conner containing yet more plant room images and again these had not been shared with either me or the IMT prior to this point. Dr Hood was concerned that Darryl would get into trouble for sending these but did not say from whom. These pictures included images of bird droppings on plant room floors and a dead bird on the floor.

i) Do you recall this email?

A I do recall this email, Dr John Hood requested these images for his investigation, I passed this request to my line manager Colin Purdon who confirmed it was okay for me to send them.

ii) Who took the images of the plant room?

A These images where a collation of images taken personally and by other estates colleagues, some photos were taken and provided by estates contractors, and uploaded onto the estates shared drive for record. I do not recall specifically who took what pictures, just that was what had been compiled.

iii) What did these images show?

A Bird droppings and images of a dead bird within the level 12 plantrooms.

iv) How would you describe the volume of bird droppings and dead birds contained within the imagines? What concerns, if any, did you have regarding this?

A Bird droppings where widespread and varied in volume with the largest quantity observed within the end of plantroom 123 (box highlighted on drawing) I recall a single dead bird from the images. My concerns where around where the breaches in the fabric may exist and how long had the pigeons had been getting into the plantroom that contributed the quantity of droppings. I recall the neutralisation and cleaning of this debris to be a high priority in order to bring this ingress under control.

v) Were you concerned that you would get in trouble for sending the images to Dr Hood? If so, explain why.

A No, this is why I sought permission from my line manager prior to sending them to him.

f) Discuss your involvement at the Cryptococcus Sub-Group Meetings - actions taken, internal escalation: HPS involvement.

A Please see A-152e

g) What, if any, external reporting occurred?

A The reporting and terms of reference for the group were managed by the group chair Dr John Hood.

h) PAGs/ IMTs/ AICC and BICC involvement.

A I attended IMTs in relation to the incident that are well documented within the meeting minutes.

i) What steps were taken in response/ precautions put in place?

A Please see A-152e

j) Did you read John Hood's report?

A No I had since left NHSGG&C and joined NHS Scotland Assure before his report was completed and released. I do recall Tom Steel Director of Estates and facilities for GG&C emailed me a copy not long after I commenced my new role with NHSSA however did not get the chance to read it due to new ongoing work commitments.

k) When did you read John Hood's report?

A Please see Answer -j

l) What observations, if any, did you make after reading John Hood's report? What actions were taken following the John Hood report?

A Please see Answer-j

m) What else could have been done? How could matters have been handled differently? What concerns, if any, did you have about how matters were dealt with?

A In my experience, I found the investigation and resultant actions to be carried out with the up most effort and respect by all stakeholders in support of the investigation.

n) What involvement, if any, did you have in the investigations?

A I assisted John Hood by providing him, with system service schedules, PPM information, system schematics and layout as fitted information. I escorted him to areas of the site where he wished to visit and gain an understanding through measurement of preexisting pressure cascades between adjoining areas. I reported at regular meetings chaired by John Hood on the progress of estates actions agreed and issued by the group.

Risk Assessments ward 4C

152. We understand that in 2020 Risk Assessments were carried out in respect of Ward 4C in order to actively assess the 'risk associated with the exposure to airborne pathogens from ventilation systems, for immune compromised patients'. You were involved in this risk assessment.

a) Describe your involvement, if any, in the risk assessment carried out in 2020?

A I don't recall being involved in the risk assessment to actively assess the 'risk associated with the exposure to airborne pathogens from ventilation systems, for immune compromised patients', I do remember having the ward surveyed for Air change rates and associated pressure cascades. I also recall preparing a Ward 4c option appraisal paper for Alan Gallacher and Tom Steele to be reviewed and potentially used as part of this risk assessment by others, outlining the options I believed where available to achieve ventilation compliance or strategy improvements to support this patient cohort within the live build environment.

b) What action, if any, was taken following the risk assessment in 2020?

A I recall an option was selected that included risk reducing improvement works for ward 4C that where subsequently carried out by operational estates. Some of the improvements made where very identical to the previous improvements carried out for ward 6A, such as corridor Ceiling vent grill removal for normal ceiling tiles. Installation of patient room en suite ceiling void HEPA scrubbers. Patient room IPS panel inspections, room fabric inspection and repairs. Source AHU filtration increases from F7 to F9 opakfill, confirmation and necessary steps to ensure all patient rooms where notionally positive to corridor etc.

c) How were any matters escalated, either internally or externally? Explain your answer.

A I reported all work progress to Alan Gallager Head of Estates.

d) Why were risk assessments for Ward 4C not carried out prior to 2020?

A I don't know why.

e) Why did you start carrying out risk assessments of Ward 4C in 2020?

A Please see A160a

f) What prompted the risk assessment of Ward 4C in 2020?

A This would be for IPC to advise.

153. We understand that in 2021 Risk Assessments were carried out in respect of Ward 4C in order to actively assess the 'risk associated with the exposure to airborne pathogens from ventilation systems, for immune compromised patients'.

a) Describe your involvement in the risk assessment carried out in 2021?

A Please see A160a

b) What action did you take, if any, following the risk assessment in 2021?

A Please see A160a

c) How were any matters escalated, either internally or externally? Explain your answer.

A Please see A160a

d) Why was the risk assessed as medium? What criteria merited this assessment? To what extent has your view of the risk assessment changed if at all, since 2021?

A This would be for the IPC and clinical teams to advise.

e) What further action, if any, should have been taken?

A Please see A160a

f) What potential adverse risk to patients arose, if any, due to failure to take further action?

A I am not qualified to quantify these risks, this would be for the clinical and IPC teams to confirm.

154. What risk assessments were carried out in respect of Ward 6A and Ward 4B? In your answer consider the following:

(1) When did these risk assessments begin?

(2) What were the risk assessments in respect of?

(3) What action was taken following any risk assessments carried out?

(4) What further action, if any, could have been taken?

(5) If no risk assessments were carried out, why? How would this have impacted patient safety?

A I was not part of these risk assessments; my role was to provide my line management with ventilation strategy and maintenance overview and option appraisals to assist stakeholders in their assessment.

155. We are aware of upgrade works being carried out in respect of Ward 2A at RHC. Do both adult and paediatric patients have a similar profile of infection risk? Why were upgrade works not carried out for the adult hospital Ward 4C?

A I am not qualified to answer this question about patient infection profile this would be for clinical and IPC teams to advise. Ward 4C did receive some upgrade works but not to the same level of refurbishment as Ward 2A.

156. To what extent did the upgrade works carried out to Ward 2A result in a higher level of protection to patients from risk of infection, than that offered in Ward 4C, both at the time and now? Explain you answer:

A I believe the design intent for the ward 2A upgrade works was to comply with the guidance standards recommended within SHTM-03-01 (A) & SHPN-04-01 (Sup1) for a neutropenic patient group inclusive of complete AHU plant replacement and significant fabric modifications. Ward 4C received

modifications previously described to improve the environment within the as built parameters of the ward.

157. Why did the adult patients not receive the same level of protection from infection as paediatric patients?

A I don't know.

158. How did the use of chilled beams impact patient protection from infection in Ward 4C?

A This would be for IPC to quantify; I can advise from an estates perspective that chilled beams have limited flow rates and can impact on the level of ACH rates to the space served by them.

159. To what extent did the use of chilled beams in Ward 4C contribute, if at all, to higher levels of infection in patients?

A IPC to advise.

160. To what extent did the lack of HEPA filtration impact patient protection from infection in Ward 4C? If so, how so? If not, why not?

A IPC to advise.

161. To what extent did the lack of HEPA filtration in Ward 4C contribute, if at all, to higher levels of infection in patients?

A IPC to advise.

162. To what extent did the lack of air permeability impact patient protection from infection in Ward 4C?If so, how so? If not, why not?

A This is difficult to quantify as the rooms within this ward are not dedicated Isolation rooms with the commissioned and validated air flow rates to support a ventilation strategy that would require the measured permeability to achieve the standard of a neutropenic ventilation strategy. IPC probably better to respond to this question.

163. To what extent did the lack of air permeability in Ward 4C contribute, if at all, to higher levels of infection in patients?

A IPC to advise.

164. To what extent did the negative room air pressure impact patient protection from infection in Ward 4C?

A IPC to advise.

165. To what extent did negative room air pressure in Ward 4C contribute, if at all,to higher levels of infection in patients?

A IPC to advise.

166. How did the non-compliance with SHTM in relation to air chances per hour in Ward 4C impact patient protection from infection in Ward 4C?

A IPC to advise.

167. To what extent did the non-compliance with SHTM in respect of air changes per hour in ward 4C contribute, if at all, to increased levels of infections in patients?

A IPC to advise.

168. To what extent did non-compliance with SHTM in relation to room air a pressure in Ward 4C impact patient protection from infection in Ward 4C? If so, how so? If not, why not?

A IPC to advise.

169. How did any non-compliance with SHTM in respect of room air pressure in Ward 4C contribute, if at all, to increased levels of infections in patients?

A IPC to advise.

170. What action has been taken to improve on risks associated with airborne pathogens to patients in Ward 4C following the risk assessments from 2020 and 2021?

A I have described the ward Improvements carried out to my knowledge at that time in my answer to Q1c

171. To what extent, if any, has Ward 4C been non-compliant in respect of SHTM ventilation requirements since the opening of QEUH/RHC in 2015? Explain your answer.

A To my knowledge Ward 4C was commissioned to the standard of a general ward, which is advised under guidance STM-03-01 to achieve 6 air changes per hour, requested surveys around this period indicated the measured ACH rates where less than this approximately 2.5-3 AChs per hour.

172. Why has no further action been taken to upgrade Ward 4C in order to achieve SHTM compliance?

A I don't know.

173. What else do you wish to add in respect of the risk assessments of Ward 4C in 2020 and 2021 that you feel could be of assistance to the Inquiry?

A Nothing at this time.

Staffing and working environment

174. What were the staffing levels like in estates at the point of handover? Where did the staff come from – were they mainly transferred from old site?

A At the point of handover staffing levels where not complete to my recollection as new operatives were still arriving to start from other hospitals that were pending closure and decommissioning. To my knowledge staff where recruited from other sites through application and interview prior to handover like myself, while others operatives where redeployed on closure of their resident hospital sites.

175. Concerns if any about staffing following handover – to what extent did the staffing levels manage the workload? Refer to Bundle 8, document 40.

A I was not in a position as Estates Duty Manager to make this assessment and at this point in time the size of the workload was not clear to me.

176. Was appropriate training in place for new and existing staff on using new systems and working within the QEUH? How did you ensure that new and current staff were appropriately trained? Refer to Estates Communication Bundle, document 5 - what was this and what was the training like? How did this assist you and staff with working at QEUH – was it equipment focus, asset focused please describe.

A Please see Answer 38 b & e

177. Did you consider the training to be sufficient?

A

178. Who was responsible for providing staffing? Who was responsible for ensuring staffing was maintained at sufficient levels?

A It was my understanding that Ian Powrie requested and confirmed the original staffing compliment, from that point onwards staffing maintenance was managed through internal management process, for example a supervisor would recruit and interview a technician, an Estates manager would recruit and interview a supervisor, a site manager would recruit and interview an estates manager etc.

179. What concerns did you have regarding staffing levels?

A I felt we didn’t have enough staff to account for sickness and annual leave on the shift teams, these were crews of 5 shift teams to cover emergency response and out of hours ppm for the entire campus out of hours which was easily impacted by absence.

180. What was the working environment like when QEUH opened – work life balance/ workplace culture? What issues, if any, did you have? If so, what concerns did you raise? Who did you raise these concerns with?

A When the QEUH opened it was a very busy period, long hours, lots of changing and competing priorities and everyone finding their feet. It was an exciting period due to the sheer size and expectation of the facility and presented to me personally a significant opportunity to learn and develop my skill sets and experience.

181. Who was on site to manage and assist with carrying out works relating to equipment? How did this assist your workload in estates? To what extent, if any, was there a reliance on commercial third parties such as Multiplex when it came to staffing levels?

A My understanding was staffing levels were not related to contractors on site to fufill the estates compliment but were utilised to assist and support post handover workloads and the influx of new departments occupying areas and their requests. As service contracts were still being established for various systems contractors were procured on a need-to-need basis to support the ongoing priority of works as and when required depending on discipline, specialisim and resource. Brookfield Multiplex and their sub contractor Mercury were still on site carrying out snagging and defect works and were contactable for sign posting of information should it be required.

182. Generally – discuss the workplace environment and culture – What concerns, if any, did you have?

A I found the workplace environment and culture to be a positive experience, the majority of people I encountered were motivated and appreciated they were involved in a exciting new facility that presented a challenge. The only concern I recall having was AP & Cp discipline training and appointments were on going rather than in place prior to handover and that it would take time and site experience for everyone to get their bearings of the geography

of the hospital and understanding and awareness of the systems within them before our estates service was truly effective.

183. Describe the handover process? What concerns, if any, did you have in the run up to handover? How successful was the handover?

A I was not involved in the handover process; this was the responsibility of the project team.

184. GGC took handover from Multiplex earlier than initially contracted for – what did you think about this? Why did it happen? What was the rationale for the early handover?

A I don't know why this happened.

185. Were the concerns raised by infection control colleagues regarding the general build of QEUH/RHC taken seriously? What action did you take in response to these concerns, not already mentioned in your answers? Refer to Estates Communication bundle documents 100 and 116 in considering your answer.

A I was not aware of the concerns raised by the Infection Control team about the general build these concerns would have been communicated to senior personnel of the estates and facilities team.

186. Is there anything further that you want to add that you feel could be of assistance to the Inquiry?

A No.

Declaration

187. I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

188. The witness was provided the following Scottish Hospital Inquiry Bundles / documents for reference when they completed their questionnaire statement (Appendix A).

Appendix A

A48807918 – Bundle 1 – Incident Management Team Meeting Minutes (IMT Minutes)
A43273121 – Bundle 3 - NHS National Services Scotland: SBAR Documentation
A43293438 – Bundle 6 – Miscellaneous Documents
A48806285 – Bundle 8 – Supplementary Documents for the Oral Hearing commencing on 12 June
A48808157 – Bundle 9 – QEUH Cryptococcus Sub-group Minutes
A48807604 – Bundle 12 – Estates Communications
A49267796 - NHS - Karen Connelly - Feral Pigeon Infestation - QEUH - 08012019

Scottish Hospitals Inquiry
Witness Statement of Questions and Responses
Thomas Romeo

This statement was produced by the process of sending the witness a questionnaire with an introduction followed by a series of questions and spaces for answers. The introduction, questions and answers are produced within the statement.

Personal Details

1. Name, qualifications, chronological professional history, specialism etc – please provide an up-to-date CV to assist with answering this question.

A. Thomas Romeo.
Electrical Apprenticeship, HNC Electrical Engineer and BEng Engineering Management. I don't have an up-to-date CV

Professional Background

2. Professional role(s) within the NHS.

A. Electrical Technician , Electrical Supervisor and Estates Manager

3. Professional role (s) at QEUH/RHC, including dates when role(s) was occupied.

A. Duty/Estates Manager. QEUH Duty Estates Manager 2015, QEUH Estates Manager June 2017 to March or April 2018

4. Area(s) of the hospital in which you worked/work.

A. Whole Hospital old and new as Duty estates manager

a) Which particular areas of the hospitals “old and new “?

A. My area of expertise/training was electrical as QEUH Duty Manager the QEUH (New hospital) during the day as required, nightshift the whole site Old and New as required. As Estates Manager Dayshift (New hospital) as required QEUH

5. Role and responsibilities within the above area(s)

A. I Managed Emergency breakdowns dealing with contractors from 2015 to June 2017, from June 2017 for 8 months PPMs & dealing with contractors.

6. Who did you report to? Did the person(s) you reported to change over time? If so, how, and when did it change?

A. David Brattey and Colin Purdon

a) Please provide dates as to whom you reported to

A. I don’t know the exact dates, all I know is when David Brattey retired then I reported to Colin Purdon. There will be records of David Brattey’ s retirement held somewhere in HNS records.

7. Who selected you for your role(s)? When were you selected for your role(s)? Please describe the selection process for appointment to this/these roles?

A. Alan Gallacher & Ian Powrie can’t remember the process, however there where many elements.

a) Please describe the “many elements”.

A. It was 11yrs ago I don’t remember, however there must be records within the NHS records files. All I know all the Duty Managers that worked in the QEUH went through a selection process.

8. Had you worked with any of your QEUH/RHC estates, project team or management colleagues prior your role(s) at QEUH/RHC? If so, who had you worked with before this current role? When did you work with this/these colleague(s)? What role were you in when you worked with this/these colleague(s)? How long were you colleagues in this/these previous role(s)?

A. No

Estates QEUH/RHC

9. In January 2015, how many people worked in Estates? Did the number of people working in Estates change during your time at QEUH, if so how so?

A. I'm not sure as there where day shift, duty shift and old hospital day shift

10. How was communication between you and your colleagues? What communication issues, if any, arose?

A. The communication was good, however I can only speak for the staff I was managing at any one time

11. How did you keep a record of work delegated?

A. The work completed was recorded on the NHS PDA system, PPM and contractor paper works where logged in binders and stored for the allotted time scale.

a) Please explain the workings of the PDA and PPM systems and their functions

A. PDA this was a hand held device carried by all maintenance staff, this device recorded jobs the maintenance staff got individually. The ward or department would log issues and faults on their work station computer, this in turn would go on to the maintenance data base which the estates supervisors had access to. They would allocate the works to the appropriate staff, the staff who logged the fault could check the process of the logged jobs. Once a particular job was complete it would be signed off by the maintenance staff, it will also show on the maintenance data base as completed. PPM (Planned Preventative Maintenance) where carried out to ensure the equipment worked

within the required design and operation specification, and is fit for purpose as per the appropriate SHTM (if appropriate)

12. Which other QEUH teams or departments, if any, did you work closely with?

A. When I was Duty estates manager I only worked closely with estates duty shift workers, when I worked as a day shift estates manager I worked more closely with more estates workers.

13. Please describe your working relationship with these QEUH teams or departments (including areas of hospital work on).

A. I believe my working relationship with everyone I came into contact with during my time within QEUH was professional.

14. What concerns, if any, did you have about any member of staff? If so, please describe these concerns. What action, if any, did you take in relation to these concerns?

A. I had no concerns about any Estates staff.

15. What concerns, if any, were ever raised about management/ managers? If so, please describe these concerns. What action, if any, did you take in relation to these concerns?

A. None to my knowledge.

Training

16. What formal training or qualifications do you have in of the following:

a) Water

A. Mandatory L8 training in 2012 – All NHS staff had this classroom training. All NHS staff had to attend these class room courses, I attended on at Glasgow Royal Infirmary 2012, I can't remember what was involved, however there will be record held within the GGC NHS Data base of the course content

b) Ventilation

A. CP training in 2012 C&G.

i) What was involved?

A. You had to show your competence in safe isolation & lockoff of electrical equipment, along with a City & Guild theory exam. All records were held in the Operational Procedures folder.

c) Infection Control

A. This was mandatory training, which everyone in the NHS had. IC gave guidance notes and gave instruction when and if required.

i) Please describe the nature of the training and give examples of situations in which instruction would be required

A. I can't remember the exact content of the training, any works being carried out within a ward had to have had a HAI scribe completed and passed by all named persons on the HAI Scribe

17. If so, can you go into more depth about any training and qualifications? – (When trained? When qualified? Who was the awarding body?) Please describe how the training and qualifications were relevant to your work at QEUH.

A. I'm a qualified electrician SQA, a HNC SQA in electrical engineering and a BEng in engineering management UWS. My qualification were relevant as my area of expertise was electrical, electricity is in part of every of the systems within any hospital not just QEUH

18. What specific roles or duties within the estates team have you had in water systems operation or maintenance? How long did you have these roles and duties?

A. I arranged maintenance and sampling by DMA Canyon, I was in this role for around 8 months, from June 2017.

19. How aware were you of any specific legal responsibilities/ obligations when working with the water systems. If so, please provide additional information.

A. The only person who had legal and obligation responsibilities was the AP (Authorised Person) for the water system, I had no AP training for the water system while employed within the NHS. My role from June 2017 for 8 months, was to arrange water sampling and flushing from DMA Canyon in critical areas of the QEUH/RHC and any other sampling, flushing and any other instruction from Infection and Control. The only other guidance available for the water system was SHTM 04.

20. If you did not have any roles or responsibilities in relation to the water systems operation or maintenance:

a) Who did?

A. As far as I'm aware no one within the QEUH/RHC had AP Water training.

b) What were these responsibilities?

A. The AP Water roles and responsibilities would have been explained during the AP water course, the SHTM 04 could be used as guidance.

c) What did you understand the responsibilities to be?

A. I'm not qualified to say, However my understanding of an AP duties was to keep everyone within the hospital safe as reasonably practicable and follow the IC (Infection Control) instruction and follow the guidance of SHTM 04.

d) How aware were you of any specific legal obligations/ responsibilities? If so, please provide additional information.

A. Water Risk Assessment were reviewed annually and risk assessed every 24 months, critical areas were flushed and sampled.

21. What specific roles and duties did you have in the ventilation systems operation or maintenance ?

A. From June 2017 (for 8 months) I issued PPMs via NHS PDA (and accompanying/documentation paper work) to estates staff as per SHTM 03, annual AHU inspection for critical areas were carried out by external

contractors H&V. All documentation were stored for the allotted time scale as per SHTM 03, during the time at QEUH I didn't have AP ventilation training. The only guidance used was SHTM 03.

a) If you did not have any roles and responsibilities in the ventilation systems operation or maintenance, who did?

A. I don't know.

b) What were these responsibilities?

A. To ensure compliance.

c) What did you understand the responsibilities to be?

A. Although not trained as AP for Ventilation at the time stated in Q20, my understanding of an AP duties was to keep everyone within the hospital safe as reasonably practicable and follow the IC instruction and follow the guidance of SHTM 03.

d) How aware were you of any specific legal obligations/ responsibilities? If so, please provide additional information.

A. My role was to allocate maintenance documents (as per SHTM 03) for maintaining the AHU within QEUH/RSC especially in critical areas, ensuring they were tested annually by qualified external contractor and follow the IC instruction and follow the guidance of SHTM 03.

22. What large scale water systems had you worked on before the QEUH? What large scale ventilation systems had you worked on before the QEUH? If so, when? How did the size of those systems compare to working on the QEUH? What was your role and duties?

A. I had never worked on any large scale water system before working day shift (June 2017) in QEUH, I was a estates supervisor at NHS GRI where I issued PPMs for ventilation and electrical works.

a) Please describe the process as to why /how PPM`s were issued for ventilation and electrical works.

A. The PPM were issued to the maintenance staff via their PDA's along with paper work to complete, once their tasks were complete they would sign off the task on their PDA, the completed paper work would have been placed into the ventilation binder under that AHU. Any part used would be reordered, to ensure sufficient supply of filters and belts for each AHU were available

Documents, Paperwork, and Processes in Place as at 26th January 2015

We know that handover of QEUH occurred on 26th January 2015:

23. Describe the site when QEUH/RHC at handover in January 2015.

A. Not sure what you mean, as every new build requires snagging.

a) What was the state of the site on handover?

A. I'm no builder as I stated all new builds require snagging

24. How long did Multiplex remain on site? How was this managed, and were records kept of Multiplex staff being on site, if so, who was responsible for this and where were such records kept? What concerns, if any, did you have?

A. Not sure how long Multiplex remained on site, they had to sign every time they were on site. They had a list of works to carry out, don't know who they reported to or where their completed recorded were kept.

25. Operating systems at handover:

a) How many staff were allocated to maintaining operating systems and how was this determined?

A. Can't remember, as I had other works to manage.

b) What training was put in place for maintaining the operating systems?

A. The estates staff at the handover would show the remainder of the estates staff from the other closing hospitals.

i) Which estates staff would carry out this task and what did the task involve?

A. I can't remember being there at any of these training sessions.

c) Who carried out the training? Refer to **Estates Communication Bundle document 5 – 'Brookfield Multiplex Client Training & Familiarisation Register for Ventilation'.**

A. Not sure, I remember David Wilson from Brookfield being present at the training session and the contractors who installed the system.

d) To what extent, if any, were Multiplex involved in the training?

A. David Wilson was present at most if not all training sessions.

e) How extensive was the training provided to allow staff to operate the systems?

A. No training lasted more than a few hours, however the equipment installed within the QEUH was similar to the equipment from the hospital the estates staff came from. Apart from being newer and better technology, as a result this training was required.

i) What did the training involve?

A. I can't recall, it might have been a presentation of how the equipment worked

f) Please list the manuals/ documents that were handed over.

A. It was 9 years ago can't remember, however documentation did accompany the equipment installed.

26. Detail the snagging process, refer to **Estates Communication Bundle, documents 90 and 91** when considering your answer detail:

A. I don't have an answer to this as I wasn't directly involved

a) What happened

b) How long were Multiplex on site following handover

c) Main areas for snagging

d) Records of works carried out

e) Sign off – who as responsible and when signed off.

f) How satisfied were you with the snagging process?

A. Instruction was given to sign in the snagging teams, they had (I think an A4 or A3) sheet with the areas that required snagging works to be carried out.

27. Refer to **Estates Communication Bundle document 113:**

a) What is this? What was your involvement?

A. No involvement.

b) Why was it issued in 2017 and not earlier?

A. Senior estates managers might know the answer to this or the project team as CAPITA where the project team I think.

c) At **page 855** there is reference to the Estates' meetings regarding the supervisors report, was all the work carried out? At close what, if any, works remain outstanding?

A. The best people to answer this question are those who attended the meeting.

Asset Tagging

28. Describe and detail asset tagging:

a) What is this? Why is it important?

A. This is an ID Number on every piece of equipment, for the full life time of the equipment to ID any repair records, condition and fit for purpose.

b) Who was responsible?

A. I don't know.

c) What was the impact if this was not done?

A. It would be more difficult to track the equipment and it's condition.

d) What concerns, if any, did you have about this?

A. I had no concerns about this, as any piece of equipment I noticed which was operational had an ID Tag.

e) How did you escalate these concerns? If not, why not?

A. I had no involvement in this process

f) What actions, if any, did you take to address any asset tagging issues?

A. I had no involvement in this process

29. The Inquiry understands that there was a CAMF system in place at QEUH/RHC. In your answer provide details of who this was reported to, what action was taken to remedy matters.

a) What is the purpose of CAMF, and who was responsible for providing this?

A. It was software for tracking assets inventory, I had no involvement with this system.

b) How does ZUTEC differ from CAMF?

A. I don't know.

c) Who was responsible for ensuring provision of CAMF and ZUTEC? What would happen if it was not provided?

A. Sorry, don't know.

30. Provide information on any issues in relation to CAMF and ZUTEC .

a) Operation

A. Don't know of any.

b) User suitability

A. Was okay.

c) Any other matters

A. No

31. Who was responsible for developing a system for asset registration? when and how long did it take following handover?

A. Sorry, don't know.

HEPA Filters

32. Dr Gibson in her statement refers to HEPA filters not being in place at the point of handover in wards 2A/B.

a) Were you aware of this at the time? If so, what was the impact of HEPA filters not being installed?

A. I wasn't aware of this as I had no involvement with the ventilation at the time of handover.

b) What was done to resolve any HEPA filter issues?

A. Sorry can't answer this question, as I don't know

c) Who was responsible for providing HEPA filters and ensuring that they were installed during the build?

A. At the handover time I don't know.

33. To what extent, if any, were HEPA filters installed in the relevant rooms at handover (January 2015)?

A. I wasn't involved in the ventilation system at the handover

34. To what extent were HEPA filters missing from any other wards following handover?

A. I don't know

a) What actions were taken to address missing HEPA filters?

A. I don't know I wasn't involved

Chilled Beams & Thermal Wheels

35. To what extent, if any, is the use of chilled beams in areas housing immune compromised patients compliant with SHTM guidance?

A. I do remember there was an occasion when the chilled beams came up, however I never had any involvement in the maintenance of them.

36. If you have answered no to the above, what was the potential patient impact?

A. I'm not qualified to say

37. Describe your understanding at the time of the cleaning regimes in place for chilled beams? To what extent were you involved in the cleaning regimes for chilled beams?

A. I had my own work to carry out, I wasn't involved in the cleaning or maintenance regime for chilled beams.

38. What specific events do you remember in relation to chilled beams?
For example:

a) Dripping chilled beams in critical care refer to **Estates Communication Bundle, document 63.**

b) Issues with dew point controls refer to **Estates Communication Bundle, document 65.**

c) Ward 2A cubicles 8-11 refer to **Estates Communication Bundle, document 106, in particular page 821.** In particular consider the issues with dust collecting on the chilled beam units, the PPM actioned in response and the work that you carried out in response to the issues, was it effective, was it timely? Do you consider the PPM to have been reactive rather than proactive? How was your working relationship with infection control colleagues in dealing with this situation.

d) Water samples being taken from chilled beams in Ward 6A refer to **IMT Bundle, document 73.**

e) Dripping condensation panels and chilled beams **Estates Communications Bundle, document 153.**

f) Any other issues/ incidents not mentioned above.

A. I'm not sure of the issues with the chilled beams, however I do remember something being mentioned about them but I was not involved in chilled beam maintenance. As far as I'm aware there were no chilled beams within isolation rooms. With regards to IMT Bundle Doc 73, I had left QEUH by then. I have looked at the email in Doc 153, Bundle 12 and I was either duty estates manager with no involvement in any maintenance at QEUH or had left the QEUH.

For each event please tell us:

a) What was the issue?

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved?

d) What was the escalation process?

e) What, if any, external organisations were approached to support and advise?

f) If so, what was the advice?

g) Was there opposing advice and by whom, and what was the advice?

h) What remedial action was decided on and who made the decision?

i) How was the issue resolved – consider any ongoing aftercare/support/monitoring;

j) Any ongoing concerns witness had herself or others advised her of?

k) Was there any documentation referenced during or created after the event. For example, an incident report?

l) Who, if anyone, signed off the work to confirm it had been completed and the issue resolved/area safe?

Write your answers above in the relevant section.

39. To what extent, if any, was the use of thermal wheels in areas housing immune compromised patients compliant with SHTM guidance?

A. As far as I'm aware no thermal wheel AHU were used in suppling ventilation to Isolation rooms Operating theatres.

40. If you have answered no to the above, what was the potential patient impact?

A. I'm not sure.

41. What specific events do you remember in relation to thermal wheels?

a) What was the issue?

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved?

d) What was the escalation process?

e) Were any external organisations approached to support and advise?

f) If so, what was the advice?

g) Was there opposing advice and by whom, and what was the advice?

h) What remedial action was decided on and who made the decision?

i) How was the issue resolved – consider any ongoing aftercare/support/ monitoring;

j) Any ongoing concerns witness had herself or others advised her of?

k) Was there any documentation referenced during or created after the event. For example, an incident report?

l) Did anyone sign off to say the work had been completed and issue resolved/area safe.

A. Don't recall any issues with the use of the thermal wheel AHU, if there was why would it have been designed and passed before installation

Water Guidance and Obligations

42. What guidance applies to water? How did you/others ensure that guidance was complied with?

A. SHTM-04, it was the AP for waters duties to ensure compliance.

43. Who was responsible for ensuring a safe water supply following handover?

A. Sorry don't know, as my area was electrical HV and LV and Medical Gas (Low hazard) at that time.

44. What water safety training was provided to all maintenance staff, estates officers and contractors?

A. The only training I had was mandatory L8 awareness training in 2012, this was for all NHS staff, There was obviously plumbers within the NHS staff, As I didn't work that closely with them I could say. The contractors I got in (from June 2017 to I think Feb 2018) to carryout flushing and testing where for DMA Canyon who were fully qualified. They had to submit a RAMS before carrying out any works on the water system.

45. What was your knowledge and understanding of Health and Safety regulations on control of legionella at the point of patient migration to QEUH/RHC?

A. As I mentioned my area of qualification was electrical not water, as a result I wasn't involved with the water system at the migration time.

46. What legionella training was provided to all maintenance staff, estate officers and contractors. Please describe and detail what was involved?

A. I can only speak for myself, I only had Legionella awareness training the same as every NHS employee has to get. The L8 training was a class room exercise, I don't remember the exact content of the course. I'm sure there will be records somewhere of the course content within NHS data base

47. What water borne pathogens (other than legionella) training was provided to all maintenance staff, estate officers and contractors?

A. As I wasn't involved in the water system nor the AP for water, I didn't have any other water training.

48. Who was the Duty holder?

A. A duty holder has to be appointed not delegated. During my time as day shift estates manager no one was the duty holder for water.

a) Why was that?

A. That's a question for senior estates manager to answer.

49. How aware were you of obligations to appoint an authorised person or the like to discharge water supply safety? If so, who was appointed? When, for what period? If not, why not? Did you ever hold any of these roles in respect of water?

A. I wasn't in a position to appoint anyone or was ever appointed as an AP or duty holder for water systems within QEUH/RHC.

a) Who was in a position to appoint someone?

A. GGC NHS Board appoints AP's after the person has successfully completed the appropriate AP's course and the AE is satisfied that the person being appointed has the knowledge of the system they are being appoint for.

b) What skills, knowledge or experience would be required of a person filling this role?

A. AP water training course then has knowledge of the site water system, before being assessed by the AE water system then they are appointed by the GGC NHS Board. The person being appointed AP water system also has to agree the appointment.

51. What concerns did you have, if any, about specific roles not being filled? If you held concerns did you escalate these, if so to whom?

A. When I moved from the Duty Estates manger to day shift estates manger, I found out only after I got the job what my duties were going to be. I informed David Brattey I would not be the person responsible for the water system due to my lack of knowledge in this area. However I would liaise with contractors (DMA Canyon) to carry out flushing and sampling of the critical areas within QEUH/RSC. In fact within 2 months of moving to day shift I secured a role as Estates manager (Electrical and Medical Gas) at the RAH Paisley, however I wasn't released from QEUH until March 2018. I don't know the reason why there was a delay.

Water - Commissioning and Validation (C&V)

52. What commissioning and validation documentation did you see before handover in 2015 – if not, who would have had sight of this?

A. I didn't see any commissioning and validation documentation, it would have been the projects team.

53. Where is this commissioning and validation documentation ("C&V") stored generally on the hospital system?

A. I'm sure it was electronic data base and a hard copy.

54. What is the purpose of C&V?

A. It could be used as a reference point and to see how the installed equipment is working and show up any issues in future.

55. What are the consequences of it not being carried out?

A. If there was no C&V, you could not monitor and regulate environment which the equipment supplies.

56. How many records were kept of the cleaning and testing regime? Where were the records kept and what was the retention policy? What concerns, if any, did you have about record keeping and retention?

A. Don't know how many records were kept, However for water, Medical Gas, Ventilation, and electrical system maintenance, according to the SHTM it was 5 years. I only had 8 months storing maintenance records, the documentation was stored as per SHTM.

57. What concerns, if any, would you have If the water system were to have no C&V before handover in 2015? Why were you concerned?

A. At that time, my interests were in HV, LV electrical and Medical Gass as I was one of the AP for these three disciplines mentioned.

58. Describe the same in respect of verification and the cold-water supply system.

A. As above.

59. What C&V of the water system was carried out post-handover?

A. Don't know.

a) Who was responsible?

A. Don't know.

b) How was the C&V recorded?

A. Don't know.

c) What concerns, if any, arose post-handover about C&V? If so, why did these concerns arise?

A. I don't remember any.

Water System – Testing and Maintenance

60. What testing and maintenance protocols and regimes were in place? What should have been in place. If it wasn't, why wasn't it? What did you do about that?

A. What time scale, as I was only involved in any maintenance after June 2017.

a) Please explain the testing and maintenance protocols that were in place during the period after June 17 when you were involved in maintenance?

A. I was only involved in the water testing maintenance for critical areas, I did however act under instruction from IC (Infection Control) and Senior estates managers. For additional testing and other works relating to the water system

b) Please describe the protocols/instructions/guidance which you followed during your involvement in the water testing maintenance for critical areas.

A. I can't really elaborate more than the answer I gave; IC would be the best to answer this question about protocols/instruction/guidance as they will probably still be using the same methods today. As I mentioned if I was instructed to test area, ward or room within QEUH for specific water test I would have got DMA Canyon this work to carry out with full instruction on the type of lab test required. Due to the passing of time, I can't recall specific protocols/instruction/guidance given by IC for give time while I worked at QEUH.

61. Describe your involvement in the filling of the water system prior to handover? Did you have any concerns about this? How did this impact the bypass filter?

A. Wasn't involved.

62. What concerns, if any, did you have about the temperature and movement within the water system? How was this recorded and measured? Who was responsible for this? If Schnieder did these were these reports forwarded to yourself or other GGC employees? How were these reports responded to, what did they tell you? How were issues flagged in these reports dealt with/ resolved?

A. I wasn't aware of any concerns as far as I can remember about the water temperature and movement.

63. What concerns, if any, did you have about testing and stagnant water being in the system following testing? Please describe and provide information on how this was dealt with.

A. My involvement with sampling and testing of the critical water system was after June 2017, which was all carried out by DMA Canyon.

a) Please describe your involvement in this process

A. I was the estates contact and sign off payment for these works to be carried out

64. What concerns, if any, did you have about dead ends/ legs in the system? Please describe and provide information on how this was dealt with.

A. Don't remember being involved in the removal of any dead legs at QEUH.

65. Refer to **Estates Communication Bundle, document 10,** explain the cleaning and maintenance of the water system, taps, drains, shower heads etc. When doing so consider:

a) What is the cleaning regime?

A. I looked through **Bundle 12, Doc 10,** I wasn't involved with any maintenance or cleaning regime for the water system until June 2017, I thought the cleaning would be soft FM regime.

b) What is the importance of this?

A. It is always important to carryout maintenance and cleaning on every system, this ensure compliance and safety to patients and staff.

c) What responsibilities did you have a result of this?

A. As 64a, I wasn't involved as mentioned until June 2017.

d) What did you do to ensure these responsibilities were executed?

A. After June 2017 I used DMA Canyon for sampling and testing, early 2018 they were involved in thermally disinfecting taps, cleaning strainers and replacing straighteners and shower heads (shower head replaced every month) in W2A RHC.

e) What issues, if any, did you have fulfilling these responsibilities?

A. After June 2017, other than not being able to gain access to some rooms in W2A due to patients condition, none.

f) What concerns if any were raised about cleaning practices? **IMT bundle, document 23.** Detail these concerns. Refer to **NHS GGC SBAR Bundle, page 112** when providing your answer.

A. I looked at IMT Doc 23 I think I had left QEUH by this time, Don't know anything about SBAR Page 112.

g) What, if any, matters regarding the maintenance of the water system were escalated? If so, were they escalated BICC or AICC?

A. Any maintenance I carried out after June 2017 for around 8 months, was documented stored and actions were taken if any results were out of range.

h) What is dosing, and why was chlorine dioxide used in the cleaning regime? **IMT bundle, document 30.**

A. Dosing is cleaning part or whole of the system. However, I had left the QEUH by the time of this meeting.

66. What was found in the water tanks; what if anything significant was found in the water tanks? To what extent would anything found result in a wider issue of water contamination?

A. What date is this question referring to. I don't remember asking DMA Canyon to test the water tanks unless they were included in critical areas. However as I have said on various occasions if requested by Senior Estates Managers or IC to carry out additional sampling and testing, I would have got DMA Canyon to carry out these works

a) When you were involved, if anything significant was found in the water tanks, what would be your role especially if it may result in a wider issue of water contamination? Please explain.

A. I don't recall anything being found in the water tanks, what date is this question referring to?

b) **Please refer to Estates Team Bundle, document 91, page 754:** Look at column 78 – debris in AHU – was soon after handover (document referred to is dated

"There was debris in the water tanks found following handover"

From an Estates prospective, Can you provide a further detailed comment on the issue of debris in the water tanks? How you would respond to such an important issue and what is your opinion as to how debris in the water tanks could impact on the water system generally?

A I wasn't involved in any part of the water system at or soon after handover, sorry I can't answer this question any further. I don't really have an opinion on this matter as I don't have the full facts, I was busy with the electrical and medical gas (low hazard) systems at that time

67. Concerns have been raised regarding the hospital design and the increased risk of water contamination; what is your view on the increased risk of water contamination in relation to the following:

a) Having a single barrier approach water system, resulting in fluctuating water temperatures.

A. I'm not qualified to say.

b) Ensuite bathrooms attached to each room.

A. I'm not qualified to say.

c) Overprovision of water outlets leading to sink removals

A. I'm not qualified to say.

68. Describe the water flushing regime at handover, describe your involvement, the recording process, why is it important? What is the impact if it is not carried out?

A. I wasn't involved in the water system so I can't say.

69. To what extent could the water system in QEUH/RHC have been more comprehensive?

A. I'm not qualified to say

70. To what extent could the water system have achieved the system objectives if operated correctly? In your answer set out what the system objectives were and how these were/ could have been met.

A. I'm not qualified to say.

71. Describe any ward/area specific water systems used?

a) Detail the individual ward water specification

b) What were/ are your thoughts about this

c) Why, if applicable, did certain wards have different water systems

d) Was there a standard protocol for sanitising water systems?

e) If so, what was the standard protocol?

A. The only specific water system used was in the Dialysis units, which had their own separate filtration system. All the rest as far as I know were the same water system.

72. To what extent were the standard protocols for sanitising water systems followed on a system of the size and complexity of this one?

A. I can only say if I was instructed to organise any works (such as sanitising) by Senior estates managers and IC on the water system (after June 2017 for 8 months), I would get DMA Canyon in to carry out such works if required to do so. it would have all been documented and recorded.

73. Who, if anyone, was contacted to advise on sterilisation of the water systems?

a) Who were they?

b) Had you worked with them before?

c) Describe and comment on the methodology used.

d) Who decided to accept it or not.

e) What was the outcome?

f) What paperwork or records were kept in relation to their installation; maintenance or flushing?

g) How were these kept on paper or electronically?

h) What equipment for recording work was used by employees doing day to day tasks?

i) How was that then reported back and checked?

A. I remember being instructed by Ian Powrie and IC to get RHC W2A water system sterilisation. As a result I got DMA Canyon to carry out sterilisation, they were already carrying out flushing and sampling within QEUH/RHC. At the time I was day shift manager (June 2017 for 8 months). The method they would have used would have been in the form of a risk assessment and method statement, which would have been given to Mr Powrie and IC to look over and make sure it met all compliance requirements. Only once the process was accepted by Mr Powrie, IC and ward/area manager would the work be carried out, I'm not sure of the outcome as the results and documentation were sent to Mr Powrie, IC and Ward/area manager.

74. Ian Powrie tells the Inquiry that there was an issue in around April 2015 when the water supply was lost to QEUH/RHC due to a failure on both water plants. Ian Powrie tells the Inquiry that resolve the issue water had to bypass the filtration plant and feed on of the tanks with mains water. He further tells us that you supervised the manual fill.

a) What was the impact of bypassing the filtration plant in these circumstances?

A. If Mr Powrie said it happened then I have no doubt it did. However I have been asked this question before by the police enquiry, I couldn't remember this incident as at the time as we had a lot of issues such as people being trapped in lifts, blocked drains in the A&E, Auto doors breaking down, pneumatic pod system breaking with patients' blood samples not getting to or returned form the Lab and blood also contaminating the system due to pod lid not being sealed properly by user. Fire alarm going off regularly it was a busy place around that time.

b) Is bypassing the filtration plant compliant with SHTM guidance?

A. As I said can't remember this incident, with regards SHTM I don't know.

c) Was the system flushed and drained completely after it was filled with water which bypassed the filtration plant? If not, why not? What was the potential impact?

A. I don't know.

d) Was this incident reported to HPS/HFS? If not, why not?

A. I'm sure if Mr Powrie was involved in this incident he would have reported it to the appropriate authorities, I don't recall attending any enquiry regarding this incident.

e) What impact did this action have, if any, on the presence of debris being found in the water tanks?

A. As I said I don't remember, Mr Powrie would be the best person to ask.

Taps

75. What is your recollection of the use of Horne taps?

A. From which time scale, as I only had dealing with the taps early 2018.

a) When you were dealing with taps in 2018, what is your recollection of the use of Horne Taps?

A. I left the QEUH by March or April 2018, as a result must have been before that. These were the taps that were fitted during the build, as a result must have been pass for installation. As I mentioned I was only dealing with water testing of critical areas, I was only dealing with the tap as instructed by Senior estates managers or IC staff.

b) At the time, how aware were you of the incidents in Northern Ireland concerning Horne Taps? What was your level of knowledge of the incidents in Northern Ireland and the decision to use Horne Taps in QEUH/ RHC?

A. The only incident I recall from NI was during Cupriavidus outbreak, when I asked Dr T Inkster for guidance on how to deal/treat this water issue. Her reply was to send me a document relating to a case in NI, which was one sheet of paper and not very helpful.

c) Flow straighteners – when did you become aware that they were non-compliant with SHTM 2027 and SHTM 04-01 guidance? To what extent were they non-compliant at handover? **IMT Bundle, document 27.**

A. As I have mentioned I wasn't involved in the water system at QEUH/RHC until June 2017 for 8 months, I had left the QEUH by the time of IMT Doc 27

d) How involved were you with testing in high risk areas?

A. What time scale is this question referring to, after June 2017 for 8 months I got DMA Canyon to carryout sampling and testing in critical areas within QEUH/RHC.

76. How involved were you in the decision to use point of use filters?

A. Senior managers and IC made the decision to use point of use filters, I ordered the end of line filters (for a short time, around 2 months) once instructed by senior managers Colin Purdon.

a) Who was responsible for the effective management of and installation of the point of use filters?

A. Senior manager Colin Purdon.

b) To what extent, if any, did the point of use filters meet the water regulation requirements? How effective was the gap between the water level and the filter to prevent contamination?

A. Don't know.

c) Why were the point of use filters not introduced earlier? What are the possible consequences of not having point of use filters?

A. The decision was made by senior managers and IC.

d) What are the consequences of not having point of use filters? Please explain

A. I'm not or was I ever in a position to comment, as I don't have the appropriate knowledge or training.

e) How often were you aware of the filters being changed? Were the manufacturer's recommendations followed?

A. If I remember correctly, I was asked to order PAL filters as they could last longer, I think the manufacturer recommend change them every 3 months. However I think they were changed every month, I can't be sure as I was only involved for a short time before leaving the QEUH.

77. What was your involvement in the cleaning and maintenance of taps; what was the cleaning regime, how was it recorded, who was responsible; any issues or concerns, if any, you had around the cleaning of taps?

A. Early 2018 I organised DMA Canyon to clean the taps under instruction of senior estates mangers and IC, once their RAMS were accepted by senior estates managers, IC, and ward/area manager these works commenced.

a) Please explain what was involved in the cleaning regime, how it was recorded /checked. Did you have any concerns regarding the cleaning of taps?

A. RAMS will explain the work carried out (which were accepted before the works commenced), I didn't have any concerns with the process as the RAMS accepted by the parties named above.

Communication Regarding Cleaning and Maintenance – Water

78. Have you ever been advised not to contact someone/ not to provide water testing information? If so, when? By whom? and why?

A. No never.

79. Have you ever refused, or directed others to refuse to provide water testing information requested by microbiologists or infection control? If so, why? Provide as much information for your rationale and the consequences of withholding information.

A. No never.

80. Describe how you dealt with requests for water testing results from microbiologists and infection control - what requested information did you provide? If not, why was paperwork not provided?

A. During my time as day shift estates manager (June 2017 for 8 months) , I provided all information I was asked by microbiologists and IC.

DMA Canyon Reports

Refer to Bundle 6 – Miscellaneous documents – documents 29 and 30.

81. When did you first become aware of this report?

A. I remember when Colin Purdon received the water risk assessment draft. DMA would be best placed to answer that question. As it was above my allotted budget, Colin Purdon had to sign it off and retained by Senior managers with a copy being place in the water OP folder. DMA would not issue it to us until the water risk assessment was paid. Once the payment was received the final risk assessment was given to Colin Purdon. I'm not sure of the time it took from Colin Purdon receiving the draft copy till payment was received, DMA or Colin Purdon could answer that question.

a) Were you surprised that the 2015 report was not actioned when you came to work on the 2017 report?

A. In reference to the 2017 Report (Water Risk Assessment) draft, and as I have said, my involvement with the water system was water sampling and testing of critical areas within QEUH/RHC and any additional works on the water system as requested by IC and senior estates managers. This would have been the water AP's area of work, if there was no water AP on site it would be the water AE area of expertise.

82. Were you aware of the report being discussed prior to 2017? If so, by whom?

A. No I was not aware of this being discussed, until the meeting I had with Allan McRobbie in June or July 2017, as I was involved with Electrical, Medical Gas and breakdowns before this time.

83. Are you aware of an Action Plan being prepared of carried out in respect of the 2015 report?

A. No.

84. How often were DMA Canyon present at QEUH/RHC site between 2015 and 2018?

A. I can only speak about the time I dealt with them, from June 2017 for 8 months.

a) During the 8 months of your involvement, how often did DMA Canyon visit the site?

A. They were on site regularly, as DMA Cayon regularly to carry out the water testing/sampling in critical areas, along with other works instructed by IC and senior managers.

b) What, if anything, did DMA Canyon say about the report during their time on site between 2015 and 2018? If so, when and what was mentioned?

A. From June 2017 for the 8 months, we were really busy with flushing and sampling critical areas in the QEUH/RHC and the issue with Cupriavidus along with Medical Gas maintenance work to discuss anything else at that time. It would have been discussed at a senior management level.

85. DMA Canyon prepared another report in 2017 **(Bundle 6 – Miscellaneous documents , document 30).** What works, if any, recommended in the 2015 were carried out prior to the 2017 report?

A. I don't know, the recipients of that report in 2015 would be best placed to answer that.

86. What happened with DMA Canyon in 2017 – tell me as much detail as possible. Who dealt with matters, what was your role and when did you become involved? Who sanctioned the works in 2017 report?

A. DMA said the AP for water was untrained, DMA assumed I was the AP for water system however I only did as I was instructed. As a result I got DMA to carryout flushing, sampling within QEUH/RHC critical areas and later to thermally disinfect the taps in Ward 2A, straighteners and replace straighteners as instructed, They also changed the end of line filter and replaced the shower hoses and nozzles monthly in W2A. I'm also sure DMA

did clean the water tanks although I wasn't there at the time, as a result not sure which estates manager was involved in that.

87. What was the impact, if any, of the failure to implement the 2015 recommendations on patient safety?

A. Sorry I can't answer that question as I wasn't AP for water for 2015.

88. We understand that Infection Control were only advised about the 2015 DMA Canyon Report in 2018. Why were they not told sooner? What happened?

A. I wasn't involved in any maintenance before June 2017 for 8 months, as a result I can't answer that maybe Mr Powrie could answer that. My only question would be why did they leave it so long before asking for DMA Canyon Report from 2015

a) Who was the 2017 Report delivered to?

A. Senior Estates manager at the time, as far as I can remember it was Colin Purdon.

89. Whose responsibility was it to be satisfied that the risk assessment had been carried out? Explain how you were satisfied that the appropriate risk assessment had been carried out prior to patient migration to QEUH.

A. It would be the responsibility of AP for water, AE for water should have intervened and insisted the appropriately trained person would be appointed.

February 2016 – Sinks – Ward 2A

In early 2016 a PAG took place regarding the *'Contamination of aseptic pharmacy unit at RHC water supply with Cupriavidus pauculus'* a subsequent investigation linked the infection to sink within the Aseptic Pharmacy Unit:

90. Why did a PAG take place?

A. I don't know as I had no involvement in the water system at this time within QEUH/RHC.

91. What was your involvement, if any, with this matter?

A. None.

92. What action, if any, was taken?

A. As I said I wasn't involved in the QEUH/RHC System, so I don't know.

93. What further issues, if any, arose in relation to sinks? If so please discuss, confirming your involvement and action taken in response to any issues.

A. I wasn't aware of any other issue with sinks, as my remit at that time was electrical and medical gasses (low hazard) at that time

Water Incident 2018

94. Walk through the concerns as they emerged in 2017 into 2018 in respect of the water issues. Initially focus on your recollection of events as they happened. In relation to the concerns:

a) When did the concern arise?

b) Nature of concern?

c) Possible cause of concern?

d) Action taken in response to concern?

e) What actions were taken in response to concern?

f) How sufficient were these actions?

A. I take it the question is about the Cupriavidus issues, I was informed by IC to carryout sampling in I think it W2A/B. I can't remember the extent of the sampling initially; the concern was how this happened and to contain and irradiate this out break. Estates where guided by IC, all the taps in W2A where thermally disinfect and parts changed as required. Then the water system was sensitised which was all documented and recorded, by DMA Canyon they issued RAMS which were agreed by Senior estates manager, IC, and Ward area manager. The system was flushed out and tested only when a clear result was obtained did the water system go back online, I'm not sure of the results of this action as I left not long after. However, the results of these actions were given to senior NHS managers including IC.

95. The following IMTs have been highlighted to assist with this. If you are also able to respond to the questions raised in respect of the IMTs below when considering your recollection of events.
Refer to **IMT bundle, documents 13 to 21:** Cupriavidus bacteraemia in ward 2A at the end of January 2018

a) What do you recall of this incident/ issue?

A. I believe all parties involved worked really well together and worked to the best of their abilities.

b) When did it begin?

A. I received email from IC to sample some room in RHC W2A and send the sample to the lab, at that time Cupriavidus wasn't mentioned. I had to ask as the action plan had to be amended accordingly.

c) How did it come to light? Who first reported the incident?

A. It was only after the samples came back from the lab and to IC, I had asked for further instruction on how to treat this issue.

d) What was your involvement?

A. I acted on the IC instruction.

e) What was your involvement with fungal testing? Refer to **IMT bundle, document 15:**

A. I asked microbiology to sample for fungal test as instructed by IC, any test results I received I sent on to the relevant parties as normal.

f) Refer to **Estates Communication Bundle, document 121;** how does this link to the IMT? Was this as a result of what was being discussed? What happened following this email?

A. Sorry, I don't know, I wasn't included in these emails.

96. Refer to **Estates Communication Bundle, documents 125 and 133;** what was the relevance of these document to the water incident?

A. At this time I was no longer involved in any water systems tasks for Doc 125, I had left QEUH at the time of doc 133.

97. Describe any other issues or matters arising from the water incident:

A. I don't know of any.

Water Technical Group

Refer to Water Technical Group Bundle

98. What was the purpose of the Water Technical Group? What was your involvement, if any, with the group? What actions were undertaken by yourself, if any, relating to the Water Technical Group?

A. I had no involvement or knew about this group. I might have left QEUH by then.

Board Water Group

Refer to Water Safety Group Bundle

99. What was the purpose of the Water Safety Board Group? What was your involvement, if any, with the group? What actions were taken by yourself, if any, relating to the Water Safety Board Group?

A. Sorry I don't know as I wasn't involved in this group.

Review of Issues Relating to Hospital Water Systems' Risk Assessment 26th September 2018

Refer to Estates Communication Bundle, document 134

100. Who commissioned/ordered the report? What issues prompted the instruction of this report?

A. After a meeting with Allan McRobbie shortly after coming on to day shift estates manager and finding the last water risk assessment was carried out on 2015, a new risk assessment was required. As it was over my budget I informed Colin Purdon who instructed me to get DMA to carry out Water risk assessment.

101. What interviews, if any, were in connection with the report?

A. Allan McRobbie gave me the draft copy of water risk assessment, I then gave to Colin Purdon to read over and then pay for to get the main water risk assessment. I don't know if Colin Purdon had an interview in connection with this report.

102. What views, if any, did you express to the author of the report?

A. If I'm honest I didn't read the draft as it was only in draft form and I wasn't asked for my input from estates senior managers on the draft.

Other Water Incidents

103. What other specific events do you recall in relation to water? For example do you have any recollection of debris in the water tanks and the cleaning of water tanks, If so, please explain:

a) What the issue was;

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved;

d) What was escalation process;

e) Were any external organisations approached to support and advise;

f) Detail role and function of HPS and HFS, advise if they were involved and any reports prepared by them;

g) Detail advice given from external organisations; what was the advice, did you agree with it, how was any advice managed/ communicated with others in your team and your superiors?;

h) Was there opposing advice and by whom;

i) What remedial action was decided on and who made the decision;

j) How was the issue resolved? – consider any ongoing aftercare/support/monitoring;

k) Detail any ongoing concerns you had, or which you were made aware of;

l) Was there any documentation referenced during or created after the event? i.e. an SBAR/ minutes from a meeting – use the bundle provided to assist.

m) Did anyone sign off to say the work had been completed and issue resolved/area safe? If so, who?

A. As I have stated I wasn't involved with any PPMS until June 2017 for 8 months, however I do remember giving HPS and HFS access to documents under instruction of David Brattey (I think) was it to do with Cupriavidus.

104. What were the NHS procedures for raising concerns about water issues or water infections.

a) How were these dealt with by you?

A. The action would be to fill in the water action plan and send it to IC and await instruction.

b) How was it confirmed they had been dealt with?

A. IC would give Estates instruction to help deal with any issues.

c) What water issues or water infections were you concerned about?

A. Every water issue is a concern and should be dealt with.

Ventilation – Guidance and Obligations

105. What was your understanding at handover in January 2015 of water guidance and regulations specifically SHTM guidance?

a) What is the purpose of the guidance?

A. I wasn't involved in the ventilation at handover, however the SHTM is to ensure compliance and were reasonably practicable ensure safety and fit for purpose. The ventilation in critical areas are verified via testing by external contractors. All documentation will be placed in the ventilation folders, for ease of access for yearly audits by AE for ventilation.

b) What are the possible consequences of non-compliance with the guidance?

A. When I was involved with the ppms for AHU in June 2017, the AHU ppm regime was working by that time. I just carried it on I don't recall it got to the stage where the AHUs got into a non-compliance state, as the AHU tested that year didn't fail, I was never the AP for ventilation within the QEUH/RHC, as a result I had no in-depth knowledge of AP duties.

c) To what extent was the ventilation system in compliance with the guidance at handover/ when you started at QEUH/RHC?

A. I don't know.

d) How satisfied were you of the compliance?

A. I wasn't involved in ventilation at the handover.

e) What documentation did you see that satisfied you? Where was that documentation stored? How often were you able to access the stored documentation?

A. I wasn't involved in the ventilation at the handover, as a result I'm not in a position to say.

f) How was this matter escalated? If so, to whom? To what extent, if any, was the ventilation systems non-compliance discussed with any colleagues? What further action, if any, was taken to ensure that the ventilation system complied

with the guidance? Who was responsible to regulate compliance, if so, please explain your knowledge, understanding and role within that team:

A. I wasn't involved with the ventilation system at handover, as a result I can't say

106. Describe the role of Authorised Person for ventilation, who held the position, responsibilities, consequence of not having an Authorised Person. Did you ever hold this position? If so, when? If you held the role what qualifications did you have that assisted with this role?

A. My understanding of the AP role was to ensure compliance. However, I never held the role as the AP for ventilation within QEUH/RHC, as at the time I didn't have the appropriate training and was never assessed by the AE for ventilation or authorised by GGC NHS Board. My involvement after June 2017 for 8 months was to give out PPMS for AHU which was a check list (for months, 3 monthly, 6 monthly) with the maintenance the mechanical engineers had to carry out. The maintenance list came form SHTM-03, then the Critical AHU inspected annually by external contractors (H&V).

107. What is your general view of NHS GGC's compliance in respect of ventilation at QEUH/RHC:

A. As far as I was aware the SHTM 03 was complied with as reasonably practicable.

<u>Ventilation - Commissioning and Validation</u>

108. Describe the commissioning and validation process in respect of the ventilation system in the QEUH/RHC.

A. Sorry wasn't involved with the ventilation commissioning.

a) Who was this carried out by? What was your involvement, if any?

A. Don't know, I had no involvement.

b) Who signed off?

A. Don’t know.

c) To what extent, if any, did infection control have input prior to sign off? **Refer to Estates Communication Bundle, document 22.** For reference in this email Christine Peter’s states that Craig (Williams) has not seen anything in writing about the ventilation.

A. I don’t know.

d) How aware were you of any concerns raised at any point about the ventilation system and its commissioning?

A. I wasn’t aware of any concerns.

e) How does commissioning differ to validation?

A. Commissioning is carried out before any system is put into operation, whereas validation is when a system is approved. I wasn’t involved in the ventilation system/commissioning at QEUH/RHC.

109. Have you seen the validation documentation for the ventilation system as at handover (Jan 2015)?

A. No.

a) If yes – who carried this out, who signed off, who authorised?

A. N/A

b) If no – should you not have sought this? Who is responsible for ensuring it is in place? Who should have chased this up?

A. No! as I wasn’t involved with the ventilation system until June 2017 for 8 months, at that time my involvement was to arrange ppms for the AHUs that where already established

110. Where would the paperwork have been stored/ Who would have been responsible for it?

A. I don't know, I know there was a storeroom in the Lab BLK at QEUH where full binders were stored. Not sure if these documents were stored there.

111. If validation was not in place at handover, how did the hospital open? Who would have had the authority to allow the hospital to open without validation in place?

A. As I said I wasn't involved in the QEUH/RHC ventilation system, as a result I can't answer that question.

112. What concerns, if any, would you have if there were no C&V of the ventilation system?

A. Like any system they would be needed to ensure compliance and validation purposes.

113. Why would no C&V of the ventilation system give rise to these specific concerns?

A. If C&V for any system wasn't available how can you tell if the system was compliant, or how well it was operating

<u>Verification – Ventilation System</u>

114. What is verification?

A. Verification in this context is to ensure a system is working as designed.

115. What is the purpose of verification?

A. To ensure compliance with manufacturers guidance.

116. How often should verification be carried out? Who was responsible for carrying out verification?

A. It would depend on the system being verified; critical AHU were tested annually by an external contractor (H&V).

117. Was the ventilation system verified or not prior to handover? If not, should this have been done? What are the consequences of the ventilation system not having been verified prior to handover? What obligations, if any, did you have to seek verification in respect of the ventilation system?

A. I can't answer that question as I wasn't involved in the ventilation system at the handover time.

118. Described the wards and areas of the hospital that required verification?

A. All wards and areas require some type of ventilation.

119. What issues or concerns, if any, did you have in respect of verification at QEUH/RHC?

A. I didn't have any.

120. What would the consequences of verification not being carried out have been?

A. For any system it would mean it could possibly be non-compliant.

121. If verification was not being carried out, who else in your team would have been aware? What action, if any, was taken?

A. I don't know, I can only speak for the time I involved in Critical AHU PMMS, they were carried out annually.

Testing – Ventilation

122. What testing and maintenance protocols and regimes were in place?

A. The AHU were maintained and tested as per the system that was in place when I became day shift estates manager, the maintenance list for tasks to be carried out, which came from the SHTM 03.

123. What concerns, if any, did you have about the ventilation system at the point of patient migration to QEUH?

A. At that time, I wasn't in a position where I would be concerned, as I wasn't involved in the ventilation system.

124. What concerns, if any, did you have relating to the ventilation? What concerns, if any, did you have relating to the water temperature? What concerns, if any, did you have relating to the movement within the water system? **Refer to Estates Bundle, document 123.**

A. I think I had left QEUH by this time.

125. How achievable was it to incorporate a comprehensive ventilation system into the QEUH/RHC?

A. I don't know.

126. Describe any ward/area specific ventilation systems used?

A. As far as I was aware high risk, critical care rooms and operating theatres had their own AHU, other areas (noncritical) had AHU that supplied multiple rooms.

127. What comments, if any, do you wish to make about the ventilation systems that were used?

A. I don't have any comments to make.

128. Explain your involvement, if any, with a review of specialised ventilation areas.

A. I don't remember having any involvement in the review regarding specialised ventilation areas.

<u>Specific Events in Relation to Ventilation System</u>

129. Can you recall any specific events in relation to ventilation? For example: In 2015 prior to patient migration there were checks to the ventilation in Ward 2A in particular, with there being issues in relation to breaches around the trunking, ceiling lights etc with the extract grills not being compliant with SHPN.

A. I wasn't aware of any issues with the ventilation system as I wasn't involved in it.

a) What was the effect of that non-compliance? What was done to remedy the breaches?

A. I don't know I wasn't involved.

b) Lack of HEPA filters and general concerns ward 2A/B, **refer to Estates Bundle, documents 35 and 37.** Detail how the issues managed, what was your responsibility, outcome. Highlight any concerns you had with regards to work/ testing being carried out.

A. I can't answer this question as I wasn't involved in the ventilation system at this time.

c) Dr Brenda Gibson raises their concerns, **refer to Estates Communication Bundle, documents 17 & 18.** Describe your involvement and any actions taken in respect of this matter.

A. I don't remember having any involvement in this.

d) Air permeability tests not carried out, **refer to Estates Communication Bundle, document 47 Capita NEC3 Supervisor's Report (No 53) - dated September 2015.**

A. I wouldn't know anything about this, as I wasn't involved in any ventilation until June 2017.

e) Issues with rooms 18 & 19 Ward 2A **Estates Communication Bundle, documents 46, 67 and 68.**

A. I have read the relevant Docs 46, 47 and 68, not sure of my involvement with these issues.

f) **Refer to Estates Communications Bundle, documents 53 and 54,** describe the issues which lead to the smoke testing being required – what was the purpose? Why was this necessary/ what were the issues which lead to this? Page 419 – did you meet with Jackie Barmanroy – what was the purpose of this meeting. What was the actions taken in response – describe the working relationship between you and infection control colleagues with this matter – where was the work required recorded?

A. I don't remember meeting with Jackie Barmanroy relating to this matter, I read the email on page 419 Bundle 12. Why would I be in attendance when the email was asking for either David Brattey or Colin Purdon.

g) In February 2016 Ian Powrie prepared a report regarding the action plan for proposed increase of extract in the ensuite rooms in the Schiehallion ward, **refer to Estates Communication Bundle, document 93:**

i) Explain your knowledge of the issues

A. I don't have any knowledge.

ii) Detail the issues

A. I don't remember being involved in this.

iii) Potential patient impact

A. I don't know.

iv) What was done to resolve matters and the extent of your involvement?

A. Not sure why I'm being asked this question as I had no involvement, the people in the emails are more qualified than myself to answer this.

h) Issues in respect of the safety of the PPVL rooms and adequacy for isolating infectious or immunosuppressed patients:

A. Sorry I have no knowledge of this

i) Issues detailed in **Estates Communication Bundle documents 94, 95 and 96.**

A. This email was at a higher level than my position.

j) Issues detailed in **Estates Communication Bundle, document 104.**

A. Sorry I have no knowledge of this

k) Fungal growths in a number of rooms in ward 2A.

A. All sampling test result where logged and copies sent to the person requesting these tests to be carried out, when I got DMA Canyon to carry out sampling from June 2017 for 8 months.

l) Any other issues/ incidents not mentioned above.

A. Not that I can think of.

In providing your answer please tell us:

a) What was the issue?

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved?

d) What was the escalation process?

e) Which external organisations, if any, were approached to support and advise?

f) What was the advice?

g) Was there opposing advice and by whom?

h) What remedial action was decided on and who made the decision?

i) How was the issue resolved – consider any ongoing aftercare/support/monitoring?

j) Any ongoing concerns witness had herself or others advised her of?

k) What documentation referenced during or created after the event was there. For example, an incident report?

l) Who, if anyone, signed off to confirm the work had been completed and issue resolved/area safe?

Write your answers in the relevant answer boxes above.

130. What level of awareness should an Estates Manager and Authorised Person for ventilation have of the ventilation issues?

A. The estates managers role is to manage a process of different tasks, along with carrying out different requests from various departments they are not necessarily APs for a specific discipline, whereas APs has more awareness

with whatever their AP duties are. However they will work closely together, to achieve their objectives.

Ward 4B

131. What was the intended purpose of Ward 4B?

A. I wasn't part of the design team, as a result I don't know. All I know it was the same as the rest of the wards in QEUH.

132. How did this change, if at all, prior to January 2015? If so, what changes were made?

A. I don't know.

133. What, if any, changes were required to the ventilation system? Why were they made?

A. I don't know as I wasn't part of the design team.

134. How involved were you with the changes?

A. I wasn't involved as far as I can recall.

135. There were issues with Ward 4B though almost straight away with an SBAR being prepared on around 7th June 2015:

a) Discuss the concerns about Ward 4B. **Refer Estate Communication Bundle, document 30 -** What was the purpose of the SBAR? **Refer to Estates Communications Bundle documents 30, 31, 32** to assist with your answer.

A. Wasn't involved.

136. In her statement Dr Teresa Inkster discusses concerns regarding Ward 4B:

a) What commissioning and validation data did you have in June and July 2015?

A. I didn't have any data, I wasn't involved in the ventilation system in 2015.

b) What commissioning and validation data, if any, did you provide to Dr Teresa Inkster?

A. None.

c) What commissioning and validation data, if any, did you provide to Dr Teresa Inkster?

A. This is the same question as above.

137. How long after migration to ward 4B were patients decanted back to the Beatson?

A. Not sure of the exact date, as I wasn't involved in this project.

138. To what extent were issues raised in the SBAR from June 2015 present at the point of NHS GGC taking occupation in January 2015, and when Ward 4B was handed over to NHSGCC?

A. This is for the design team to answer.

139. How could these issues arise immediately between handover and patient migration when the Ward was signed off and handover accepted?

A. This is a question for the personal who signed off/accepted the ward

140. **Refer to Estates Communication Bundle document 62:**

a) What is this document?

A. Ventilation Report for AHU 63, supplies/Extract for QEUH W4B.

b) Have you seen it before? If so, when?

A. No.

c) What was the purpose of carrying out a ventilation report in October 2015?

A. I don't know.

d) What issues, if any, arose from this report?

A. I wasn't involved, sorry.

e) How involved were you?

A. I wasn't.

f) What matters, if any, did you escalate arising from this report? If so, to whom and why?

A. None

141. In respect of Ward 4B describe the works carried out, why, your involvement and when. Use the below to assist and detail issues you were aware of in respect of Ward 4B, your involvement and any remedial works – works done and why.

A. I wasn't involved in these works.

Refer to the following when answering, if relevant to your involvement:

a) **Estates Communication Bundle, document 71**

b) **Estates Communication Bundle, document 72**

c) **Estates Communication Bundle, document 97**

d) **Estates Communication Bundle, document 115 -** why was there 'pre-start' meeting – what was the issue with this?

142. Involvement and knowledge to HAI-SCRIBE – What was this and what was the issue? – **refer Estates Communication Bundle, documents 117 and 118 and 119.**

A. I have read the emails on page 895 Bundle 12, I was tasked by David Brattey to provide a HAI-SCRIBE for access above the ceiling tiles to check heating actuators, to 4 additional non patient related rooms. However, this HAI-SCRIBE wasn't signed off due ongoing work issues with existing HAI-SCRIBES.

143. Please provide detailed responses to points a) – e) below

a) You were tasked with carrying out works in respect of ceiling tiles

b) Describe situation

c) Action taken

d) Whether this issue was resolved

e) Was this linked to the overall works being carried out in 4B – was there patients in at the time, what happened in response to the HAI-SCRIBE.

A. [a-d) I was tasked to provide a HAI Scribe for the remove of the tile to check a heating actuators.

e) I wasn't privy to the extent of the works being carried out in W4B as a result I don't know if it was linked to the overall works being carried out]

144. Ward 4B:

a) When were Ward 4B patients decanted from Ward 4B back to the Beatson?

A. I don't know.

b) Why did this happen?

A. I don't know.

c) When patients initially transferred from the Beatson to Ward 4B was the specification of Ward 4B the same spec as the Beatson?

A. I have never been to the Beatson so I can't comment.

d) If not, then why were patients transferred from the Beatson initially if the specification?

A. I don't know.

e) What works were carried out to Ward 4B during this time? Why, Was it an issue when the ward initially started taking patients? who signed off on the works? how did it become known that the works were required.

A. This is a design question.

<u>Decision to Close Wards 2A/B and Move to 6A and 4B</u>

145. What issues, if any, were there leading up to the decant of patients from Ward 2A in 2018, such as the use of bottled water.

A. I had left the QEUH by this time.

a) What was your involvement, if any, in the decant of patients from Ward 2A?

A. I had left QEUH by this time.

b) What risk assessment and additional measures were put in place to ensure patient safety, both prior to and during the move?

A. I had left QEUH by this time.

Reports Prepared by Innovated Design Solutions October 2018

146. **Refer to Bundle 6 – Miscellaneous Documents – Documents 33 and 34.** These documents are feasibility studies regarding increasing ventilation air change rates within Wards 2A and 2B by Innovated Design Solutions.

a) Who, if anyone, contacted you in connection with these reports?

A. No one.

b) What was your involvement, if any?

A. I had left the QEUH by then.

Cryptococcus

147. Recall your understanding of the Cryptococcus infections in 2018:

a) What is Cryptococcus?

A. I wasn't aware of any Cryptococcus in 2018, before I left the QEUH.

b) What pigeon issues, if any, were there at QEUH/RHC? If you recall any such issues, what action did you take, or what action was taken? Did the action taken resolve the issue(s)?

A. The fact there was a waste plant beside the QEUH/RHC, pigeon and seagulls were and are still flying around the site. There were some pigeons on the building top, if there were any issue GP Environment were called to deal with the situation.

c) What issues, if any, were you aware of relating to Cryptococcus at QEUH? When did you first become aware of these issues? What happened in response to these issues? Who, if anyone, did you report these issues to?

A. I have never been aware of Cryptococcus at the QEUH.

d) Describe any visits you made to the plant rooms? When did you go, why did you go at that time, what did you see? What cleaning, if any, took place before the visit – if so why – what was evidence prior to the cleaning?

A. During my shift I regularly visited the plant room, to make sure everything was working as it should. Time and dates vary, However the plant rooms were always clean and tidy

e) Are you absolutely sure that the plant rooms were always clean and tidy?- It is suggested by others that there was evidence of pigeon droppings and at one point a dead pigeon was found.

A. I don't recall seeing a dead pigeon, I wasn't in the plant rooms all the time I can only state what I seen and can remember.

f) Do you recall seeing photos relating to pigeons at QEUH/RHC, if so, what did they show?

A. No I don't recall see any pictures of pigeons, you only had to walk outside to the car park and you could see them and also smell the foul smell from the waste plant nearby.

<u>Staffing and Working Environment</u>

148. What were the staffing levels like in estates at the point of handover? Where did the staff come from – were they mainly transferred from old site? What concerns, if any, did you have regarding staffing levels/ workload in estates?

A. Most of the staff came from the Victoria Inf, Western Inf, RHC Yorkhill Hosp and staff from the old Southern General, I don't know how the staffing levels were calculated. If we needed additional tradesperson, we could call in contractors.

149. What training was in place for new and existing staff on using new systems and working within the QEUH? What steps were taken to ensure that new and current staff were trained to the required standard? **Refer to Estates Communication Bundle, document 5 -** what was this and what was the training like? How did this assist you and staff with working at QEUH? – was it equipment focus, asset focused please describe.

A. As the NHS staff all came from a hospital environment and all had relevant experience within their own trades, the equipment they were working on was not new to them the only concern was the new technology that was being used to control the equipment. There was equipment familiarisation training given to the staff prior to handover, the idea was for them to show the other estates staff when they arrive on site (it was called Trainer trainer).

150. What was the working environment like when QEUH opened – work life balance/ workplace culture? What issues, if any, did you have? If so, what concerns did you raise? Who did you raise these concerns with?

A. I was on shift day shift and night shift as Duty estates manager, our concerns where the same as everyone who works in the NHS with regards to workload.

151. Who was on site to manage and assist with carrying out works relating to equipment? How did this assist your workload in estates? To what extent, if any, was there a reliance on commercial third parties such as Multiplex when it came to staffing levels?

A. It was a mixture of workload between estates staff, specialist contractor and warranty work engineers.

152. What concerns, if any, were raised by infection control colleagues regarding the general build of QEUH/RHC taken seriously? What action, if any, did you take in response to these concerns, not already mentioned in your answers?

A. As duty/day shift estates manager I believe I worked quite closely with IC, as far as I was concerned, I would take any concerns they had seriously and take the appropriate action as and when asked

153. Is there anything further that you want to add that you feel could be of assistance to the Inquiry?

A. I have nothing else to add.

Declaration

154. I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

155. The witness was provided the following Scottish Hospital Inquiry documents for reference when they completed their questionnaire statement.

Appendix A

A43255563 – Bundle 1 – Incident Management Team Meeting Minutes (IMT Minutes)

A43299519 – Bundle 4 – NHS Greater Glasgow and Clyde: SBAR Documentation

A43293438 – Bundle 6 – Miscellaneous Documents

A43955371 – Bundle 8 – Supplementary documents for the oral hearing commencing on 12 June

A47175206 – Bundle 9 – QEUH Cryptococcus Sub-Group Minutes

A47395429 – Bundle 10 – Water Technical Group/Water Review Group Minutes

A47238573 – Bundle 11 – Water SAFETY Group

A47069198 – Bundle 12 – Estates Communications

Scottish Hospitals Inquiry
Witness Statement of 1 of 2
Susan Dodd
Nurse consultant, Infection Prevention and Control, Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland

Statement

1. This statement relates to my employment within NHS Greater Glasgow and Clyde (NHSGGC) and matters associated with the Scottish Hospitals Inquiry (SHI).

2. I have provided a separate statement pertaining to matters associated with the SHI whilst employed at National Services Scotland (NSS), Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland.

3. At the time of writing, and having terminated employment with NHSGGC, I have no access to emails or documents to help inform or support development of this statement. As such, this statement is not laid out as a timeline and I am unable to provide clarity regarding dates associated with much of my statement.

Personal Details

4. My name is Susan Dodd. I live at the address provided to the inquiry. I am a nurse consultant in infection prevention and control (IPC) in ARHAI Scotland.

5. I was seconded from my post as lead infection prevention and control nurse (IPCN) at the Royal Hospital for Children (RHC) in NHSGGC to ARHAI Scotland in August 2019 before accepting a permanent position with ARHAI Scotland in January 2020.

Current Role

6. I am the clinical lead for the National Policy, Guidance and Evidence (NPGE) Programme, one of five clinical programmes within ARHAI Scotland. My NPGE programme work involves developing and maintaining the Scottish National Infection Prevention and Control Manual (NIPCM) as well as supporting education to promote its content. The reactive work involves supporting the health boards with incident and outbreak management, responding to enquiries and responding to commissioned work which may be received from a variety of sources.

Professional History

7. I qualified as a nurse in 2003 having completed a Diploma in Nursing. I went on to complete a BSc in Health Studies in 2006 before moving into infection control in 2008. I completed my MSc in Infection Control in 2014.

8. My first role as a qualified nurse was on a surgical rotation programme within NHSGGC. I relocated to London in 2004 and worked as a staff nurse in a polytrauma and high dependency unit before accepting a deputy charge nurse post in 2006 on the same unit.

9. I commenced my first IPCN band 6 post in 2008 in NHSGGC. The IPC service in NHSGGC was divided into five sectors. Specifically, I had responsibilities within the Western Infirmary General (WIG) and Gartnavel General hospital (GGH) inclusive of the West of Scotland Cancer Centre (WoSCC). This was known as the North West Sector. I was promoted to a band 7 senior IPCN in 2010 and had responsibilities across the same sites.

10. In 2014 I was seconded to an acting lead IPC nurse post in the north west sector for a period of approximately ten months to cover maternity leave before then returning to my band 7 role. On return to this role, many of the services within GGH had migrated to the Queen Elizabeth University Hospital (QEUH) and the WIG was officially closed. The IPC sectors within NHSGGC were restructured. The north west sector became the west and partnerships

sector which continued to include GGH and WoSCC. It also encompassed the NHSGGC community hospital sites and prison clinical rooms.

11. In March 2017, I accepted the lead IPC nurse role in the paediatric sector. This was my first time working in a paediatric setting.

Responsibilities, role and reporting structure at the Royal Hospital for Children (RHC)

12. I had no involvement in the planning and commissioning stages of the RHC or QEUH.

13. The RHC is situated on the QEUH Campus. I was based in the office block which housed staff members who work across both the adult QEUH and paediatric RHC sites however I only had IPC responsibility for RHC. There was no clinical activity within the office block.

14. The paediatric sector included the RHC and the neonatal intensive care unit (NICU). The NICU was part of the existing southern general hospital (SGH) estate. When the patients from RHC Ward 2A moved over to QEUH wards 6A and 4B, I had responsibility for these areas too. The paediatric patients only occupied some of the beds in ward 4B. I only had responsibility for the beds containing paediatric patients. I had no responsibility for paediatrics situated at the Royal Alexandria Hospital (RAH) or the neonatal unit within Glasgow Royal Infirmary (GRI).

15. The lead IPC nurse role was the most senior role on each sector site. I led a small team consisting of one senior band 7 infection control nurse (ICN), two band 6 ICNs and an administrator. I had oversight of a patient caseload within the paediatric sector and provided IPC advice to clinical teams. The role also included maintenance of a schedule of audit for each of the clinical areas, reporting of results and helping develop action plans for areas requiring

improvement. Education was also within my remit and involved delivering proactive or reactive education to staff depending on the situation.

16. My line manager was Sandra Devine, who was the associate nurse director for IPC. Tom Walsh was the infection control manager (ICM). Sandra Devine and Tom Walsh reported to the Healthcare Associated Infection (HAI) executive lead, Dr Jennifer Armstrong. Pamela Joannidis, was the Nurse Consultant for IPC. Pamela was my predecessor and had extensive experience in the paediatric setting.

17. I reported to Sandra Devine as my direct line manager. Any concerns or issues I had were sent to Sandra and Tom. Pamela would often be included also and would deputise for Sandra in her absence. Tom, Sandra and Pamela were based at another site. They didn't routinely visit RHC other than occasional visits to attend an Incident Management Team (IMT) meeting. I don't recall ever having any direct communications with Dr Armstrong. I rarely had contact with anyone more senior than Tom Walsh. I would typically see Tom once every month for Senior Management Team (SMT) meetings. My main contact was Sandra Devine.

18. An infection prevention and control doctor (IPCD) was allocated to each sector with one lead IPCD for NHSGGC. When I first joined the IPC service in 2008, the lead IPCD was Dr Craig Williams. I cannot remember the date when he left this role. After Dr Williams left, Dr Teresa Inkster took over as lead IPCD.

19. There were teams of microbiologists based in the laboratories. When there was no IPCD available, IPCNs could contact a microbiologist in the labs to ask them for advice. Sometimes the microbiologists would also contact the local IPCNs directly if they wanted to report a result of particular concern for example, an organism which was resistant to multiple antibiotics. It's my understanding that some of the microbiologists had some IPC experience

although IPC was not their formal role. I am unable to comment on any formal IPC training undertaken by microbiologists.

20. I attended weekly lead nurse meetings chaired by Sandra Devine alongside the other lead nurses for each sector. At each of these meetings we provided an update of sector issues and outbreaks and had discussion around the investigations and management where appropriate. We also reported any site concerns for example audit scores inclusive of key findings of concern, issues with any estates or capital planning works which may have posed an IPC risk to patients or unusual patient infections.

21. I also attended senior management team (SMT) meetings monthly. These were chaired by Tom Walsh and attended by the lead IPCNs for each sector as well as Sandra Devine, Pamela Joannidis, Ann Kerr and each of the sector IPCDs. Ann Kerr was the lead nurse for the IPCT data team in NHSGGC. A summary of all on site outbreaks and incidents was provided at this meeting also.

22. Every two months the acute infection control committee (AICC) took place. This was chaired by Dr David Stewart and later Dr Chris Jones and attended by all those previously noted as attending SMT including myself, in addition to an infectious diseases consultant, lead pharmacist for the Board and estates and facilities representatives. As with the previously noted meetings, a summary of all on site outbreaks and incidents was provided at this meeting.

23. Standard Infection Control Precautions (SICPs) are applied by all staff for all patients at all times in all care settings. The purpose of SICPs is to prevent transmission of infection. When a patient is suspected or confirmed to have an infection, actions are taken to ensure that any transmission risk to other patients is minimised. Additional controls may be required which are commonly known as Transmission Based Precautions (TBPs).

24. TBPs typically include placement of the patient in a single room, enhanced cleaning of the environment and equipment and/or additional personal protective equipment (PPE). Ward 2A consisted only of single rooms preventing the need to move patients if they tested positive for an infection. Enhanced cleaning in terms of frequency and products was in place routinely on ward 2A. This was commenced relatively early at the outset of concerns. PPE was used according to the infectious pathogen and the way in which it is known to spread.

25. SICPs and TBPs are described in chapters 1 and 2 of the National Infection Prevention and Control Manual (NIPCM).

26. When I first joined the IPCT in 2008, clinical patient results were collated in the laboratory using a paper-based system. An IPCN would collect a paper list of all the patients with reportable isolates each day. A paper record for each patient was generated by the IPCN to allow all relevant information to be documented. Paper records detailing all daily alerts enabled IPCTs to recognise any potential outbreaks however the system was not completely robust. The introduction of ICNet greatly improved this process. I cannot recall exactly when ICNet was rolled out in NHSGGC, but it was well established by the time I took up the role of lead nurse role at RHC.

27. ICNet is a clinical surveillance software system. Many health boards across Scotland are now using this system. I believe it to be used widely across the UK. ICNet has lots of functions and can be customised to suit a service. In NHSGGC it was used as a patient IPC alert system and for surveillance purposes. Results were reported based on the location the sample was obtained which in turn provides a directory of results for each of the wards in that sector. The system also had the ability to capture data relating to surgical procedures including line insertions for individual patients. This provided easy reference to patient line insertion dates and locations which was of particular use when an IPCN was investigating a blood stream infection (BSI).

28. I'm not aware that any clinical teams outside of the IPC service within NHSGGC were using or had access to ICNet. I am unsure what level of access microbiology had to ICNET.

29. ICNet was used by all IPCT sectors across NHSGGC and was managed and maintained by a data team. The data team was led by Ann Kerr who was the overall surveillance lead. Each IPCN was granted access by the data team to patient results for their own sector. I understand that laboratory staff entered all patient laboratory results onto the laboratory information management system (LIMS). ICNet then pulled the relevant results over from LIMS. The organisms reported on ICNet were determined by the NHS Alert organisms/condition list published in the NIPCM. This is a nationally agreed minimum list of alert organisms which is not exhaustive. For each organism reported on ICNet, an open case for the patient was generated. The local IPCT would review and manage each case. This would include informing clinical teams of the result and advising control measures required to prevent onward transmission. The IPCN managing each alert would then use ICNet to document advice provided for that individual patient.

30. It was also necessary to determine if the organism isolated from the clinical patient sample was considered a healthcare acquired infection (HCAI) and if so, where the HCAI was attributed to. Determining whether an organism has been acquired in the healthcare setting involves a number of considerations which will include; the date of the patient's admission to hospital and any prior admissions, healthcare outside of an inpatient stay, date of sample, previous history of the patient having had the organism, symptom onset and presence of the organism amongst other patients in the ward. Often a 48-hour rule is applied; samples obtained 48 hours or more after admission would typically be considered a HCAI however after considering all factors, it may be determined that the organism was community acquired.

31. Some of the organisms now listed in the NHS Alert organisms/condition list were not on the list in 2017, specifically some of the environmental organisms.

This meant that IPCNs had no awareness of clinical isolates unless laboratory staff or an IPCD contacted us by phone to inform us of the finding in a clinical sample. They would do this if the resistance pattern was concerning, if the organism was very unusual or sometimes if they had seen more than one in a short period of time. We had the ability to manually open a case on ICNet for these patients. Some months after we had started seeing an increase in gram negative bacteraemia (GNB) on ward 2A, Dr Inkster requested that some of these GNBs were added to the ICNet alert system.

32. The data team would also set triggers on ICNet. This would alert local IPC teams to potential clusters of the same organism in the same area over a specified time period. For example, if two or more of the same organism had been detected in a clinical sample obtained from two or more patients in the same ward within a two-week period, a trigger was generated. The local IPCT would then investigate these cases to determine if cross transmission had occurred or if there was a true increased incidence of an organism associated with the healthcare setting.

Outbreak and incident management and assessment

33. Following an ICNet trigger or notification from laboratory teams of multiple isolates of concern, the IPCT would review patient cases to establish if the cluster of results required further exploration.

34. If further exploration of the cases was required, a problem assessment group (PAG) would be convened. A PAG is a group of key individuals brought together to consider the initial information, potential or actual IPC risk and whether or not there is a need for an incident management team (IMT) to be convened. A PAG typically includes IPCT representatives, members of the clinical and nursing team and depending on the trigger being investigated, a member of the senior management team and domestic services.

35. The PAG would typically undertake an assessment of the incident to inform escalation using the Healthcare Infection Incident Assessment Tool (HIIAT). The HIIAT considers four components in relation to the incident; severity of illness, impact on services, risk of transmission and public anxiety. Each component is scored as either minor, moderate or major and the overall impact is then calculated based on a Red, Amber, Green (RAG) rating system. The RAG rating determines the onward reporting requirements.

36. If the PAG deemed it was necessary to convene an IMT, the invite list would be extended to include relevant parties. This may include wider clinical and SMT representation, wider facilities representation and a member from the communications team. Initial investigations would often be undertaken to inform discussions at the first IMT. For example, the IPCT would consider recent audit scores in the clinical area affected, review domestic cleaning in the area and observe staff IPC practices. Facilitates colleagues may be asked to collate any recent audit scores or routine environmental test results. Discussion at the initial IMT would determine further investigations and controls required to mitigate against any IPC risks. The HIIAT assessment would be undertaken at each IMT and cannot be agreed by one person but requires input from multiple IMT representatives.

37. In respect to ward 2A PAGs and IMTs, I tried to attend all of these as the lead IPCN. I was new to the sector and I was keen to establish relationships with the wider service teams. As the concerns with ward 2A began to escalate, I also felt it was important that I was visibly present as the most senior IPCN representative on site. This also helped me to stay abreast of all the incidents and developments which were increasing in number.

Events after appointment to Lead Nurse Role in 2017

38. Very early on into my appointment as lead IPCN, ward 2A was giving me cause for concern. In the first eight weeks I was in post, there were six or

seven clusters of infection which required a PAG to be convened for each. I reported all of these to the senior IPC management team. I cannot recall ever having seen so many clusters in one area over the years I had been working in IPC. Although I had managed outbreaks in the equivalent adult setting at the WoSCC they were infrequent and contained relatively quickly in comparison to ward 2A. I had not been made aware of any outbreaks or incidents or concerns relating to ward 2A, or any other ward in RHC prior to my commencement in post.

39. Some of the cases and clusters were generated on ICNet, others were reported to me by Dr Inkster or a laboratory microbiologist. An example of this would be one of the early cases of a patient blood culture sample which had grown Elizabethkingia. Elizabethkingia was a very unusual organism and was not on the HPS national alert organism/condition list, it therefore did not generate an alert on ICNet. I had come across an isolate of Elizabethkingia before and had to seek Dr Inkster's advice regarding it. I certainly hadn't seen any other cases in RHC or in my previous posts. I also reviewed the literature regarding its relevance in a clinical sample.

40. Dr Inkster undertook a review of the lab system to identify any prior cases over recent weeks or months within RHC. She identified two other cases, and both were associated with ward 2A in time and place. We reviewed the literature to help understand sources of the pathogen. It was an environmental pathogen associated with water and soil. One of the few pieces of literature described finding it in samples taken from condensation. This led us to consider the condensation which had been reported regularly dripping from the chilled beams in ward 2A as a potential source. A PAG was convened to discuss these cases.

41. In response to the Elizabethkingia findings a request was made for estates colleagues to sample the condensation on the chilled beams then undertake cleaning of the ventilation system. Dr Inkster also instructed that the water outlets were sampled by the estates team. The local IPCT also carried out a visual inspection of ward 2A environment. Patient samples were sent for

typing. The typing process allows strains of the same organism to be identified based on genotypic differences. Results assist IPC in understanding the epidemiology of the patient cases and establish links between cases or potential sources such as the environment. However, where patient types do not match with environmental types, this does not rule out a link between the two. My recollection is that all three patient cases were different types and from memory Elizabethkingia was not found in the samples taken from the chilled beams. I believe there were other organisms found in the condensate samples, but I do not recall what they were.

42. In the initial weeks an increase in bacteraemia rates was also observed. There was a general upward trend which was concerning although I am unable to recall specific numbers. Clinicians had also reported a perceived increase in fungal infections on ward 2A. My recollection is that review of lab data did not find a general increase in fungal infections however it did identify higher than expected cases of Aspergillus. I recall there were three patient cases and all of them had been significantly affected by invasive Aspergillus infection. One of the key hypotheses was mould growth within the ceiling tiles. There had been a water leak on the ward. I cannot recall the date of that. But once the leak had been resolved, the affected ceiling tile had been replaced. During investigations into the cases of Aspergillus, the ceiling void was inspected by myself and Dr Inkster and extensive mould was found on the surrounding ceiling tiles in the internal ceiling space. We also sought out any construction works taking place near ward 2A which have been known to be associated with aspergillus infection amongst patients. I don’t recall us identifying anything of significance in regard to construction works. We also reviewed the CLIC Sargent house which was a resident facility for patients and families nearby. Again, I do not recall us identifying anything of significance in CLIC Sargent house.

43. All these incidents coupled with two or three gastrointestinal outbreaks on ward 2A in those initial weeks had generated significant concern certainly by myself and Dr Inkster and the staff on the ward. These were all reported

individually by myself to the IPC SMT. To demonstrate our concerns relating to the total volume of incidents, I compiled a list of all the PAGs convened specifically in relation to ward 2A since I had started in the lead nurse post. It was a brief high-level summary detailing the trigger for each PAG, the concerns identified, the controls applied and the patient case numbers. I emailed this to Sandra Devine and Tom Walsh and possibly other members of the SMT. We did not have an IT system that triggered multiple incidents or a protocol in place describing the need for such a report in a scenario such as this. Nor would I expect there to have been one. The point was that the concern relating to the volume of incidents in one ward was out of the ordinary. From memory, I generated the summary around May 2017. In addition to sending it by email to Sandra and Tom, I also presented it at our weekly lead nurse meeting and SMT meeting. It is possible I also shared it with AICC. My understanding was that it was going to be shared with the Board Infection Control Committee (BICC). I am not aware whether this happened or not as I did not attend BICC. By submitting this summary report, I wanted to ensure my concerns around the volume of incidents over a short period of time were escalated. Dr Inkster shared my concern.

44. At the meetings I talked through the content of the report and my concerns. I do not recall much discussion or having received many questions or queries regarding the detail of the incidents. The updates for my sector at lead nurse, SMT and AICC meetings were typically far more extensive than that of the other sectors. It seemed to be that RHC was a clear outlier in terms of volume and type of incidents and most of these were associated with ward 2A. I do not recall being sought out by the senior management team to explore concerns or reports further.

45. In those early weeks the local IPCT undertook a number of investigations and applied controls in response to the incidents. Visits to the wards 2A and 2B by the IPCT were enhanced from weekly to daily with myself, or another IPCN in the team, undertaking the visit. We observed staff practice on the ward including hand hygiene, adherence with PPE use, cleaning standards, line

care and we spoke regularly to staff to help identify concerns or knowledge gaps. There were some initial concerns identified including clutter in patient rooms, and items on the clinical hand wash basins. Some of the staff PPE practice was not optimal and there were high levels of dust found. The IPCT acted on these issues immediately and the nursing and clinical team were very responsive to training and support. Audits provide a snapshot of standards and on a working ward this can be variable. Any issues picked up at the time of inspection or audit were addressed immediately. IPC education sessions were provided for staff to reinforce good SICPs. We observed parent practices on the ward also. In addition to the education sessions provided to staff, education sessions were also provided for parents on ward 2A/2B to ensure they were aware of the IPC measures they needed to adhere to and the reason why these were important. Following education and support, practices improved with the exception of the domestic cleaning which required more input.

46. Line care and application of aseptic technique was considered closely. The local IPCT observed techniques, monitored documentation, inspected the theatre where lines were inserted and considered dressing types and bungs used. We also inspected the areas where IV medications were prepared and the way they were prepared. We were seeking to understand whether there may have been a breach or change in practice, or a change in equipment used which may have triggered the increase in positive blood cultures. Some points were noted in practice which had to be addressed but nothing which would demonstrate an overall rise in blood cultures on the unit. Staff line care on the unit in general was good. We met with the quality improvement group for catheter line associated bloodstream infections (CLABSI) also who described the work they had been doing. I do not recall a lot of the detail regarding this group.

47. Domestic cleaning on the ward was also inspected. Cleaning frequencies on the ward were determined by the national cleaning specification which is produced by Health Facilities Scotland (HFS). It provides a blueprint to help

local health boards determine a frequency of cleaning, dependent on the level of risk in an area and the type of room that is involved. My recollection is that there was one domestic during the day on ward 2A. She had to undertake the first daily clean of all patient rooms and the general clinical areas before commencing a second daily clean of rooms occupied by patients with infection.

48. The IPCT did have concerns with the domestic cleaning on the ward, which were reported to the domestic team a number of times, not just by the IPCT but by the senior charge nurse (SCN) as well. The SCN would often copy me into her emails. Initial concerns would be reported to the local domestic supervisor. I can't recall the name of the specific supervisor at the time. When I emailed my concerns, I would typically include Billy Hunter who was the facilities manager at the time and Mary Anne Kane, who I think was the interim director of facilities.

49. Some areas of the hospital were very dusty. Especially the stair wells and corridors. The building seemed to generate much higher levels of dust than other hospital sites I had worked on. Health Protection Scotland (HPS) did not identify any concerns during an external audit however, I believe the domestic resource had been increased prior to their visit and whilst this was positive, this was not maintained, and issues recurred again after the HPS visit.

50. There were meetings convened by Dr Teresa Inkster with Billy Hunter to discuss the list of domestic concerns. I think the first meeting regarding 2A would have been in 2017. The local IPCT and clinical staff were becoming frustrated with the lack of long-term resolution. Issues would be rectified quickly only to recur again a short time later. Examples of the problems included high level dust, access to the patient rooms to enable cleaning and responsibilities for cleaning patient beds. I suspect this was because there was not enough domestic resource on the ward. Eventually after several meetings with general managers in facilities, first Billy Hunter and then Karen

Connolly, the domestic resource on ward 2A was increased and the standard of domestic cleanliness improved.

Overview of infections and timeline

51. A short time after I had reported the increased number of incidents on ward 2A, the local IPCT recognised an increasing number of blood cultures amongst 2A patients which had grown Stenotrophomonas maltophilia. This is a GNB associated with the environment and was another organism I had no recollection of having seen reported before. Having investigated a lot of practice on ward 2A and having seen improvements with the practice issues identified, it was at this point that I felt there may be something of significance within the 2A environment causing these infections.

52. Infections in healthcare cannot be eliminated completely but IPC measures exist to reduce the risk of infection acquisition. This is of specific importance amongst the vulnerable patient groups. In general, referral of positive blood cultures to the IPCT would typically be gram positive organisms such as Staphylococcus or Streptococcus. Gram positive organisms often harmlessly colonise the skin or respiratory tract and sources of infection can be the patient's own flora or that of a healthcare worker. Over time clusters of infection continued to present amongst the ward 2A patients. Gram negative organisms (GNO) are typically associated with the environment. Water and soil are known to be environments in which they flourish. Different types of GNO were regularly appearing in blood culture samples amongst ward 2A patients. It wasn't just the number of positive samples but the range of unusual organisms.

53. In order to effectively monitor for an increase in any single pathogen, it is necessary to understand the background rate of infection. This was considered for the Stenotrophomonas cases. One of the challenges we faced was that we only had data pertaining to cases dating back to the hospital opening in 2015. Prior to this, the patients had been on another site and

therefore comparisons were more difficult to draw. My recollection is that there had been very few cases of Stenotrophomonas between 2015 and 2017 amongst 2A patients. Possibly only one or two.

54. I recall much debate around this at IMTs. It was suggested that Stenotrophomonas wasn't part of the routine test historically and testing methods had advanced over the years therefore the increasing numbers were because there was now the ability to detect it in the labs. This was raised a number of times I think in a bid to understand the extent of the issue and whether it was truly associated with ward 2A. Throughout the IMTs, Dr Inkster was often challenged on the significance of the data and overall case numbers and whether it warranted the controls being advised.

55. Challenge, debate and discussion at an IMT are essential to utilise the expertise of those in the room and ensure that all possible hypotheses are being considered and explored and appropriate controls are in place. As the incidents associated with the 2A environment were increasing, there was a growing sense of tension at the IMTs and Dr Inkster as the chair was being challenged a lot. It often didn't feel supportive but rather it is my impression that at times, as an experienced microbiologist and IPCD, Dr Inkster's opinion was not always respected by everyone at the IMTs.

56. It's important to continually review the hypothesis for an incident and the data considerations were complex. Many of the patient cases were clinically unwell as a direct result of these GNB and this was reflected in what clinicians were seeing amongst their patient cohort. In my opinion there was justified reason to continue outbreak investigation and implement controls to ensure that risk was minimised as far as practically possible.

57. In September 2017 Dr Christine Peters was providing IPCD cover for Dr Inkster. She contacted me to report a patient blood culture on 2A which had grown Cupriavidus. This was yet another organism I was unfamiliar with. Dr Peters briefed me on investigations into a case of the same pathogen in 2016

in a patient who had been on 2A. Investigations at the time had found growth of Cupriavidus in a sink within the aseptic pharmacy, and my understanding is that the sink was removed. I had no knowledge of this incident prior to Dr Peters informing me. The aseptic pharmacy was located on the same floor and in close proximity to wards 2A and 2B. The aseptic pharmacy prepares intravenous medicines under sterile conditions such as chemotherapy and nutritional products. They did so for many of the patients on ward 2A. On finding the second case of Cupriavidus in 2017, practices in the aseptic pharmacy were inspected. My recollection was that the only action for the department was to relocate storage of dirty waste. All other practices were of a high standard. Investigations then focused back on ward 2A.

58. Every inpatient ward in RHC received a weekly visit from a member of the IPCT to offer support and discuss any patients on the ward for whom there were infection control concerns. An IPCN may return to some of the wards if a new patient referral was received. In comparison, myself or another of the IPCNs would visit ward 2A almost every day, sometimes twice per day, and for significant periods of time. Of my time spent at RHC, a disproportionate amount of my time was spent in Ward 2A. The management of issues on ward 2A throughout the period of concern overwhelmed what would be considered as my routine day to day role. I often felt concerned that an issue or concern somewhere else in the sector would be missed because of this. I noted this concern often at lead nurse meetings.

59. In response to the concerns on ward 2A, the IPCT applied many controls and spent a lot of time supporting the outbreak management. It was agreed at one of the IMTs that a member of the facilities team would accompany the IPCN on our daily visits also. I very often did these daily visits with Karen Connolly who was the general manager within the facilities team. We were also accompanied by the SCN on the ward and later the lead nurse, Melanie Hutton. The purpose of this was to ensure we all had sight of any findings and actions could be taken immediately with any areas of concern identified.

60. All typical IPC controls and monitoring were in place, increased cleaning with chlorine-based detergent, strict patient isolation, education sessions, audits, daily unit visits. Despite this there seemed to be little effect on the number of positive blood cultures being reported. Throughout the course of the affected time period, more extreme controls were applied such as installation of portable hand wash basins, ward decant, installation of portable ventilation units, extensive ward repairs. This was exceptional and I had never experienced a response like it. In my opinion it was necessary.

The water incident: Investigations and controls

61. Water sampling was undertaken many times in response to the patient infections. Water sampling was undertaken by the estates team at the outset but then DMA Canyon took over responsibility for sampling. Not every outlet was sampled but locations were directed by our early hypotheses. We hypothesised that water from the shower or splashing from clinical hand wash basins (CHWB) may have been able to contaminate the patient's line. Testing focused on areas where the patients had been. CHWBs and showers within patient rooms were included. The IPCT considered whether the giving sets used to deliver IV medication may have become contaminated if in close proximity to an outlet and so areas where the staff were preparing the medications were also included. We also tested water in the main theatre used to insert lines and in the imaging department which many of the patients had visited. Over time some sampling was undertaken from various outlets across the clinical areas in which 2A patients occupied. My recollection is that wider sampling across the QEUH site was performed when we were considering decant.

62. I am unable to recall specific dates however water sampling identified GNOs at different points during the water incident, some of which had also been identified in clinical samples from patients. Cupriavidus, Stenotrophomonas and Pseudomonas aeruginosa were all found in water samples. There were

other positive isolates but I cannot recall them all. Both patient and water isolates were sent for typing. Many of the water isolates did not match patient isolates. However, organisms have the ability to change and multiply in the right conditions such as water or soil. This means that there may be multiple types of the same organism found. Typing of organisms help rule in an environmental source but cannot rule it out.

63. I recall Dr Inkster advising the estates team that there had to be a clear protocol in place for the way in which they collected samples including whether it was pre or post flush samples that were being taken which would help determine where in the system the contamination was. Dr Inkster would explain the need for appropriate sampling protocols both at IMTs and with estates colleagues on a one-to-one basis. My recollection is that an agreed written protocol was produced. I never collected any samples or got involved with testing.

64. Flow straighteners in the taps within the RHC and QEUH were a known risk factor for bacterial growth. As part of the response to the incident, these were removed from all outlets in high-risk settings within RHC which included all the clinical areas occupied by 2A patients. During this process, Dr Inkster requested an outlet for examination in the labs. I am unable to recall the date of this. My understanding is that she dismantled the outlet and inspected and tested individual components. GNOs were isolated from the test samples as was fungi. There was also a build-up of biofilm internally.

65. Chemical dosing of the water system was performed on more than one occasion. This was usually in response to further positive water sample results. Estates teams would lead on chemical dosing. Early dosing was performed for wards 2A and 2B but later this was extended to the wider hospital site. We also performed splash tests at the sinks using a dye to help better understand and visualise the splash contamination zone.

66. Point of use filters (POUFs) were also procured and fitted to all taps and showers across the 2A pathway although I am unable to recall specific dates of this action. There are different manufacturers of POUFs that health boards can procure from. They can be attached to any outlet. They have very fine filters inside them to filter out any pathogens in the water. The filters were not an easy solution and came with challenges.

67. The filters last either 30 or 60 days, depending which type is chosen. There must be a schedule in place for replacement and a recording system noting which date each individual POUF was installed. This meant estates staff were having to regularly access patient rooms to replace POUFs. When washing hands, hands should only come into contact with the flow of water. When the POUFs were installed, it left very little space for hand washing and this meant hands could quite easily touch the filter or touch the sink, risking further contamination. They made handwashing logistically more challenging. The filters also had to be cleaned appropriately as per manufacturer's instructions. Domestic staff had to be trained how to do this.

68. It was the first time I had any experience of their use in practice during my time as an IPCN. I would typically expect POUF to be a short- term measure used when an immediate risk associated with the water system has been identified and removed again following rectification of the issue identified. My understanding is that there are a few clinical wards or areas in the UK who use them on a long- term basis having had prior concerns with their water system and I assume as a precautionary measure.

69. As further cases of GNB were reported amongst 2A patients and following IMT discussions, more extreme measures were deemed necessary and mains water supply was no longer to be used by any staff, patients or visitors across the clinical areas occupied by 2A patients. More than twenty mobile hand wash basins were delivered to the ward. These portable sinks were supplied with bottled water, which was attached underneath. These allowed nursing

staff to still wash their hands and the children to have access to running water. The portable sinks supplied warm and cold water.

70. A programme of works then took place to remove and disinfect all the mains water outlets. This was followed by further chemical dosing of the full water system. I do recall at one point there being concern around the volume of chemical dosing that had taken place. I cannot recall the volumes, but my understanding was that it was a significantly higher dose than should have been administered.

71. The control measures were considered necessary to reduce the risk of exposure to environmental organisms. However, it was clear that it was challenging and unpleasant for the patients not to have the use of the showers in particular.

72. We considered early on the possibility of oral consumption of pathogens but felt this was doubtful. On a precautionary basis, the children were provided with bottled water to drink. My understanding is that some patients in ward 2A would typically get sterile bottled water to drink during specific stages of their transplant.

73. My understanding from IMT discussions was that there was one water system supplying the adult QEUH building and another system supplying the RHC. I believe that within those systems, there were branches which could be isolated. Water testing was expanded as the incident progressed to the adult QEUH site. I do recall Dr Inkster had expressed many times in the IMTs that the water contamination identified in ward 2A was unlikely to only affect ward 2A and it was possible the problem was more widespread.

74. During the water incident, from memory I think this would have been in 2018, an external expert, Susanne Lee, was consulted. Dr Inkster was keen to get independent advice and support recognising that this incident was unusual in type and size. I can recall being advised that meetings with experts were to be

kept brief due to the costs associated with their consultancy services and for this reason there was to be a prior list of questions and queries compiled for the experts. I cannot recall who advised me of this. It may have been Tom Walsh or Sandra Devine. I was not at the meeting with the experts. Dr Inkster attended but I'm not sure who else was in attendance.

The Water incident: Drains

75. The IPCT first notified of a build-up of biofilm in the drains around early summer 2018. The clinical hand wash basins in RHC had drains which ran horizontally for around two to three inches before then draining vertically. It was this horizontal section which harboured high volumes of black grime. The IPCT undertook an inspection of all drains in ward 2A and found large numbers to contain the same black grime to a larger or lesser extent. I reported it to Dr Inkster and admittedly at that point I wasn't sure if there was a direct link between the drains and the patient infections. Inspecting drains isn't something I had found necessary previously or indeed experienced as a contributing factor within any of the outbreaks I had helped manage.

76. Following another spike in gram negative infections we noted findings relating to grime in the drains at IMTs. The IPCT carried out a review of all the sinks across the RHC site. This review found that most areas were affected to some degree with the worst affected areas being on the lower floors. In some of the drains it was visible to see that the drain circumference had narrowed because of the volume of biofilm build-up and water was slower to drain as a result. We also identified foreign objects in a few of the drains such as a toy car, penny coins and nail picks. The nail picks were found in theatre drains and had obviously washed down the drain during surgical scrubbing. There were photographs of drains that were almost fully occluded due to the volume of nail picks.

77. There was some literature associating biofilm growth with clinical infections and this was discussed at the IMTs also. The hypothesis was that on exiting

the outlet, water was hitting the drains dispersing the biofilm which was potentially contaminating patient lines or hands. Aerosolisation of bacteria was also considered.

78. A process for cleaning the drains was developed and rolled out across the 2A pathway. Due to the volume of biofilm build up, it was necessary to use a manual method and a bottle brush to remove it in addition to chemical cleaning. My recollection is that chlorine was poured down the drains after manual cleaning prior to a full clean of the CHWB being performed. A risk assessment was completed using the Healthcare Associated Infection System for Controlling Risk in the Built Environment (HAI SCRIBE) to ensure risk to patients was minimised during the process. This included removal of patients from their rooms whilst cleaning and disinfection of the drains took place. A Hydrogen Peroxide Vapour (HPV) clean of the room was performed before it was returned for clinical use.

79. HPV wasn't a standard or routine form of cleaning used in the hospital at the time. It was typically reserved for use following construction works in a clinical area or after outbreaks which may have been recurring or proving difficult to control. HPV was undertaken by an external company. HPV process requires all equipment to be removed from the room and manual cleaning to take place first. A machine would then be placed in the room to disperse the HPV which looked like a fog. The fog was able to access areas which may be missed or inaccessible during manual cleaning. It is a timely process when compared to manual domestic cleaning and this would impact room availability for patient treatment.

80. A regular maintenance programme for drain cleaning was established following this. Chemical product was poured down the drains on a weekly basis to try to prevent biofilm reforming. My recollection is that domestics were trained to do this however, if a manual brush clean was required, estates would undertake this duty under full HAI SCRIBE controls. The drains in Ward 2A were never replaced. To replace the actual drain, the whole clinical hand

wash basin needed to be replaced. However, waste pipe components, spigots, at the back of the drain were replaced. These were found to have corroded.

81. A private company was approached to scope the drains and help determine the condition of the points beyond what could be observed visually. My recollection is that biofilm was identified beyond the visible drain areas. Sampling of the drains was undertaken also in ward 2A and various other clinical areas occupied by 2A patients. Samples identified a number of organisms including GNOs.

82. There were a couple of theories regarding the cause of recurring biofilm. The first was as a result of the chemical dosing which had taken place to treat the water previously. My recollection from discussions at IMTs and following feedback from the water experts was that chemical dosing can erode the pipes, contributing to a build-up of biofilm. The other was as a result of reduced water pressure following installation of the point of use filters. The design of the drain running horizontally was also a contributing factor because it allowed a small pool of water to sit in the drain encouraging biofilm growth. Sealant towards the back of the drain had also caused an obstruction.

The Water Incident: Communication with patients and families

83. Routinely, IPCNs did not inform patients and/or families of test results. This was the responsibility of clinicians. If there were specific IPC queries clinicians couldn't answer, the local IPCN would be contacted to speak to the patient/family.

84. Duty of Candour describes responsibilities around communication with patients and exists in two parts; professional and organisational. Duty of candour in itself is a straightforward process but the incident which may have led to harm isn't always straight forward. In this case it was very complex. It takes time for those investigating an incident to gather the necessary

information to establish the cause of an incident. In this case the answers as to the cause of the patient infections weren't obvious. I wasn't involved with any direct parent communications but from discussions at IMTs and concerns raised by clinical staff it was clear that patients and parents were not being informed of the full extent of the concerns and the investigations being undertaken by the IMT.

85. I recall Professor Gibson expressing her concern about communications with parents. She felt that she needed support when speaking to them so that their questions could be better answered in respect to the environmental risk and the control measures in place. Dr Inkster offered to go with Professor Gibson to speak with patients and their families. The nursing team were approached by parents regularly with questions and queries relating to the incident and the controls in place. The SCN expressed at IMTs that the staff found this very difficult because they didn't have the answers to their questions. I recall Jamie Redfern and Jennifer Rodgers instructing the SCN to tell all the nursing staff not to provide any information about the water incident to parents if they were asked. They were told to instead contact Jennifer Rodgers or Jamie Redfern who would act as the single point of contact and go to the ward to speak with patients and families directly. My understanding was that this approach was to ensure that nursing staff weren't put in a difficult position but also so that all parents were receiving the same information and therefore less confusion would be created. I think that given the complexities of the incident that this was probably a sensible approach in terms of a communication process. I wasn't aware of the detail of what families were being told or the extent of the information provided.

86. One of the agenda items for the IMT was to discuss communications. Dr Inkster would raise various aspects of communication with IMT members. Communication discussions regularly included concerns raised by staff and parents and the growing unrest on social media groups. There was also often debate around the HIIAT assessment of public anxiety associated with the incident. There was growing media interest in the incident. Many discussions about the content of press statements took place outside of the IMTs.

87. Despite the communications led by Jennifer Rodgers and Jamie Redfern, there was building discontentment and concern from parents. From their perspective, they were being provided with information and I assume reassurance that controls were in place, then there would be further infections or another issue with the environment and naturally they would no longer feel reassured. Written statements were prepared and handed out to parents. I can't recall who prepared the statement. At the same time various media reports were also being published. A parent eventually approached the media directly with their concerns which resulted in significant media interest.

88. There was also a closed Facebook group that only parents of children in ward 2A had access to. None of the clinical staff or management staff had access to the group and the IMT were acutely aware that concerns were being discussed on this forum. This made communications more difficult as there was no NHSGGC representative able to see the concerns being raised and in turn, offer explanation or reassurance.

The Water Incident: Communication with Staff

89. I recall at least two large meetings held specifically for staff on wards 2A and 2B to communicate updates on the water incident. It is possible there were more. I attended one of these alongside Jamie Redfern who led the communication to staff. I was there to provide support should there be any IPC questions from staff. I can recall this was a well-attended meeting. It was also extremely difficult in the sense that staff tension was high and there were several staff members visibly upset. I do not think Jamie found it easy either. I could see that he was visibly struggling and was trying his hardest to answer the questions from staff as fully as he could. He appeared empathetic towards staff.

90. Although I think Jamie did a good job speaking to staff, I do feel it could have been avoided had staff communications taken a different approach from the outset.

The ventilation system

91. Prior to my appointment as Lead IPCN at RHC I had no real knowledge of any ventilation issues on the RHC or QEUH site. I have vague recollections of concerns being noted at Lead IPCN meetings in relation to the ventilation system in the adult Bone Marrow Transplant (BMT) unit, ward 4B in QEUH. This had happened prior to my appointment to the RHC post. I worked on the WoSCC site at the time of the concerns and was therefore aware that patients were transferred back from the QEUH to Wards B8 and B9 in WoSCC for a significant period of time whilst ventilation issues were rectified.

92. In my role as an IPCN, I had never had any reason to become involved with ventilation before. Ventilation was an area I had minimal knowledge of and would generally take it for granted that ventilation specifications were as they should be. I had never had an IPC incident prior that had warranted review of ventilation within ward areas. When I worked on the GGH site I would occasionally be informed of an issue with the pressures in one of the BMT rooms in WoSCC. However, patients would be promptly removed from the room until estates rectified the problem then the patient would be returned. From recollection, issues in WoSCC were identified quickly, rectified quickly and I don't ever recall patient infections being considered to be as a direct result of any ventilation failures.

93. When I moved to RHC, I became aware at a relatively early stage that the specialist ventilation rooms on ward 2A did not meet specification. I was also aware that the overall QEUH site did not meet ventilation specifications only having 3 air changes per hour (ACH) rather than the required 6 ACH. Kathleen Harvey-wood was a clinical scientist who worked on the site. She had many years of experience working with the 2A patient group in Yorkhill prior to transfer to RHC. I recall discussions with Kathleen around the air sampling which used to take place in Yorkhill and the ventilation in RHC being of a lesser standard. I can't recall if Kathleen was directly involved with air

sampling or not. Dr Inkster also confirmed this and I was aware that she had previously conveyed her concerns to SMT regarding this.

94. IPC consider patient placement generally to fit into one of three room types; positive pressure rooms, negative pressure rooms and general rooms which would only have the basic ventilation specification. Negative pressure rooms are used for patients who have a known infection, typically spread by the airborne route or a high consequence infectious disease like Viral Haemorrhagic Fever. This helps prevent the infection transmitting from the patient in the room to others on the ward. A BMT would not contain any negative pressure rooms. Negative pressure rooms would typically be found in an infectious diseases unit and in some cases, the emergency department (ED) and intensive care unit (ICU). Positive pressure rooms house patients who are immunocompromised and vulnerable to infection and act as a protective barrier helping prevent infection moving into the room. These rooms are likely to be found in wards which house the most immunocompromised patients such as BMT, other transplant units and in some hospitals the ED or ITU may have positive pressure rooms. The remaining general rooms make up the vast majority within hospital settings.

95. Some patients are both immunocompromised and have a transmissible infection. Therefore, some hospital sites have positive pressurised ventilated lobby (PPVL) rooms which perform a dual function in protecting the patient whilst also helping prevent transmission of infection to outside of the room. This is achieved by air extraction via a negatively pressurised ensuite area within the room. PPVL rooms have a lobbied area which also provides a space for clinical staff and visitors to prepare IPC measures prior to entering the patient room such as taking off any outdoor jackets or shoes, performing hand hygiene, putting on PPE etc.

96. A digital or mercury dial outside the room indicates the pressure inside each of the specially ventilated room types. The pressure fluctuates when the door is opened and therefore it is important they remain closed when not in use.

The room should be properly sealed, including the windows with no gaps in the walls or plaster to prevent air leaks affecting the pressures. The extractor needs to be positioned appropriately whether that is in the room or in the bathroom. From what I understood at the time, all these things are essential to achieve the ventilation regime. I took for granted that these requirements had been met as part of the hospital construction.

97. I had no formal training on healthcare ventilation and the extent of my understanding was limited. I couldn't describe the technical reasons as to why the ventilation didn't meet specification. Dr Inkster and Dr Peters offered support in helping me understand some of basic detail.

98. It was agreed prior to my commencement in the lead nurse role to upgrade half of the rooms to a ventilation standard compliant with specification. I recall this being noted at senior meetings, possibly AICC. I don't recall who led the review and decision making in terms of the upgrade. I had little to do with this work.

The Ventilation system: Investigation and controls

99. Concerns beyond the ventilation specification were also apparent. Condensation on chilled beams was a recurring problem. Before working in RHC I had never heard of or seen a chilled beam. My understanding is that they were a relatively new technology used to cool the air. These chilled beams were present in all of the patient rooms in ward 2A rooms and many other patient rooms across the wider site. Staff had reported condensation collecting on them and dripping down onto the floor below. Sometimes they dripped onto the patient beds or equipment in the room. The condensate was often visibly dirty. Ward staff reported this to estates teams when it occurred. I recall coming into work one Monday morning and being told that the condensate dripping from the chilled beams had been extensive across the site. It was described to me as it appearing as though it had been raining inside the building. This had occurred in both the adult and paediatric site. My

recollection is that the bed managers reported this by email. I can't recall who the email was sent to but I'm sure I was cc'd. Estates advised that the condensate build up was a result of changing weather conditions. If there was a change in temperature and particularly when it was very warm outside the condensate would collect and I recall estates colleagues explaining that it was difficult to rectify due to this. I recall there being a lot of discussion about this at IMTs due to these challenges and the nature of the recurring problem.

100. There was also a visible build-up of dust in vents. To address this, ventilation cleaning regimes were established. Like many of the works required in ward 2A rooms, this would require the patient to be removed from the room and full HAI SCRIBE measures in place before the work could be undertaken.

101. Dr Inkster again requested the support of independent external experts, this time Peter Hoffman and Malcolm Thomas to seek their views on risks associated with the existing ventilation system and potential controls. To seek independent advice would be a reasonable step to take with an incident of such complexity and size. However, it is likely that Dr Inkster was also seeking support that she perhaps should have been receiving from IMT members. Rather than helping her explore the hypotheses, it appeared as though many IMT members were asking her to justify her position in regard to the hypotheses, investigations being requested and controls being implemented.

IMT meetings

102. The IMT expanded in size over time with more senior staff attending regularly. Dr Inkster was quite clear regarding the extent of her concerns relating to the risk associated with ward 2A environment and later ward 6A. There was natural anxiety around this. The senior clinical team including Professor Gibson, Dr Murphy and other medical staff, Jamie Redfern and Jennifer Rodgers were understandably distressed at what this meant for patients and how the logistics of how they managed the service going forward. I recall the Chief Operating Officer (COO), Grant Archibald, attending one IMT around the

time of the decant. I'm not aware of the COO having ever attended an IMT before.

103. There was also a lot of tension and at times frustration conveyed at IMTs by some senior management staff in particular. I recall Kevin Hill and Tom Steele being very frustrated at points throughout the incidents. Frustrations appeared to be directed at Dr Inkster. Dr Inkster often had to ask for reports or results on multiple occasions which were necessary to allow the IMT to fully explore the hypotheses. However, these were not always made available.

104. The content of previous minutes would be debated for a long time and IMTs often extended well beyond the allotted one-hour meeting time. I recall there being a change in practice at one point in NHSGGC regarding minute taking. These were to be changed to action notes instead. Often the action notes did not capture all the necessary detail, or some members would not be content with the context of the notes. The notes would then be updated following discussion, but I don't think there was a clear system for circulating final notes for each IMT. I didn't look forward to attending IMTs because I felt that it wasn't a supportive environment. It was also evident that supplementary discussions were taking place outside of IMTs and over time I no longer felt fully informed before or after an IMT. There were pre meetings before many of the IMTs attended by the SMT. I wasn't clear on the governance or decision-making taking place outside of IMTs. In terms of anything I was reporting at the lead IPCN meeting each week and at the AICC, I am not clear on what happened to those reports or what action was being taken.

105. At an early stage, HPS were invited to join the IMTs for support and transparency. A representative from HPS attended almost every IMT. Most commonly Annette Rankin attended and latterly Lisa Ritchie accompanied Annette. There were often multiple questions posed to the IMT by HPS seeking to understand investigations and actions. HPS provided post IMT updates to the Scottish Government Healthcare Associated Infection Policy

Unit (SGHAIPU). It was common to then receive further enquiries from SGHAIPU.

106. By early 2018, the National Support Framework had been invoked by SGHAIPU. This is deemed necessary when an NHS Board requires additional support in the event of a healthcare infection outbreak or incident or data exceedance. When invoked, the framework sets out a series of actions for the NHS Board to take to ensure the necessary improvement. I don't recall ever having seen an action plan or having ever been called to discuss the implications of it with the senior IPC management team.

107. Clinical teams understandably expressed a huge amount of concern at IMTs. Professor Gibson, SCN Emma Sommerville and SCN Angela Howatt attended most frequently. Professor Gibson in particular asked a lot of probing questions of the wider IMT. She did so professionally and was respectful and supportive of the chair. In general, all the clinical representatives were respectful of the IMT process whilst clearly visibly frustrated at the degree of concerns relating to the environment, the impact of the controls and ultimately the impact on their patients. The clinical team supported the view that infection rates appeared to be high and certainly were as a result of unusual pathogens not typically seen in their patient group. There were lots of concerns expressed by clinical staff regarding communications with patients noting the volume of questions posed to them by parents on a daily basis.

Decant of ward 2A and 2B patients in RHC: selection of location for decant

108. Around late 2018 there were wider concerns regarding the ventilation supplying ward 2A. From my recollection this was as a result of an external inspection of the system which identified multiple issues. Despite controls being in place for the water, for the drains, and for the wider ventilation issues there still appeared to be a risk to patients. There continued to be clusters of infections reported in the ward 2A patients and the number of concerns which had been raised over the prior 12 to 18 months in addition to the now known

ventilation issues. A decant of ward 2A to another area was necessary to enable the ventilation system to be brought up to the required specification and make other necessary repairs to ward 2A.

109. Jamie Redfern led the options appraisal for the decant. The IMT as a whole were involved in the decision-making process but I assume the final decision would have been signed off by the executive management team.

110. The options appraisal listed all the potential options for decant locations and the pros and cons of each. I think there may have been around seven or eight options. Considerations were not just around IPC but crucially what was practical and safe from a clinical perspective. There were also considerations around the equipment needed for paediatrics and safe staffing levels as well as quick access routes to PICU, theatres and radiology within RHC.

111. The WoSCC was considered noting that the ventilation system there was of the appropriate standard. However, the WoSCC was ruled out because there was no paediatric intensive care or specialist paediatric teams on site. Both needed to be available on the same site to respond to any patient who may deteriorate quickly.

112. A pop-up hospital was also considered. My understanding is that these have been used internationally and for military hospitals. The time it took to construct this on the RHC prevented this being an option alongside concerns regarding where it could be sited.

113. The adult QEUH was then considered. The IMT didn’t go through each ward in QEUH one by one. Ward 6A was suggested from the outset therefore there must have been prior consideration with service managers from the adult site. My recollection is that ward 6A was a medical care of the elderly ward. It was noted that the adult services could move some of those patients to GGH and vacate the ward for use by the paediatric patients. It was also close to Ward 4B, which was the adult haemato-oncology unit and the proposal was that

some of the 4B specially ventilated rooms could be used for the paediatric BMT patients. The IMT agreed that Ward 6A would be the best location because of its locality to ward 4B as well as services within RHC.

114. If the considerations were only about IPC, I would suggest that WoSCC would have been the best location for the decant recognising that this area had successfully and safely treated BMT patients previously. Taking account of all the considerations however, I was in agreement that ward 6A was the right decant location.

115. The intention was that the decant was going to be short lived and was based on the planned works to the ventilation system. The IMT often spoke about getting back into Ward 2A for Christmas.

The decant – preparation of ward 6A

116. Once the adult patients had been moved from ward 6A and all equipment had been cleared from the space, a senior IPCN and I undertook an inspection to determine if any works were required prior to the ward 2A patients being transferred. Dr Inkster joined us on a couple of the inspections. There was quite a volume of work required to allow patients to decant. Many of the shower areas had water ingress around the flooring and wet wall damage. Doors to the main ward and the patient rooms were damaged. There was damage to some of the wall trunking and worktops in prep areas. We generated quite a list of issues requiring rectification. Damage such as that identified prevents adequate cleaning and promotes the growth of organisms.

117. There was an intense week of remedial works commenced by the estates team. Once they had completed the work to fix these issues, the senior IPCN and I repeated the walk round and identified a few more issues which required repair. Estates were on hand to respond quickly. The clinical team were also visiting ward 6A to prepare it for their needs and similarly management teams were doing the same to set up appropriate services for the paediatric cohort.

118. From memory there were around three or four inspections by the senior IPCN and I before we eventually said we were content that all issues had been rectified and it was in a state that we could move patients into the ward. POUFs were in place on every outlet and drain and vent cleaning schedules were commenced on a routine rolling programme. I was not involved in the actual decant of patients, this was very much led and undertaken by the clinical staff on ward 2A and 2B.

119. There were mixed views about the decant. The fact it was having to happen at all was distressing for many however it was on a background of multiple issues on ward 2A and therefore I think there might also have been a degree of relief for some that the decant was taking place allowing ward 2A to have issues addressed thoroughly.

Problems in 6A after the decant

120. It was becoming apparent that following the closure of ward 2A, more problems had been discovered and a return to the ward before Christmas was unlikely. My recollection is that the extent of the problems with the ventilation system were greater or different to that prior to the decant and a full upgrade of the ventilation system was necessary. The details of the technical findings are beyond my knowledge or understanding.

121. We received another unusual blood culture result in [redacted] 2018 belonging to a paediatric patient who had very recently died. The patient had died on PICU but was under the care of the [redacted] team and had been on ward 6A prior to PICU. The blood culture was positive for Cryptococcus. This was another pathogen I was unfamiliar with and had never seen in a clinical sample before. Over the following days further samples taken from the same patient were also positive for Cryptococcus. It seemed evident that [redacted] had had widespread systemic infection as a result.

122. Cryptococcus is a type of fungus. An initial review of the literature associated it with soil and pigeon droppings. There had been problems on the QEUH site with pigeons and seagulls and a high volume of bird excrement could be found around the site. Staff had contacted the IPCT previously to complain about the presence of the dead birds on the roof top gardens.

123. A second case of Cryptococcus was then reported to the adult team. This time it was from a blood culture taken from an adult patient cared for in the QEUH building prior to the paediatric case. The adult patient died in the January 2019.

124. Both patients had grown Cryptococcus in blood cultures taken within a short period of time, from memory there were less than 20 days between cases, and both were considered hospital acquired given the length of time they had been in hospital prior to clinical samples testing positive for Cryptococcus. This was another example of two patients, associated with the same place over the same time period with the same unusual pathogen.

125. The local IPCT began a review of the building for pigeon droppings. There was no doubt that the whole site had lots of evidence of pigeon infestation. Pigeons could be seen roosting under ledges, around the lower-level windows and in the external atrium areas. This was all clearly visible from within the building. They were found nesting in courtyards, on generators and on windowsills of patient rooms. After speaking to staff during ward visits to explore the extent of visible pigeon excrement external to the patient wards, they began highlighting it to the IPCNs when we were undertaking our routine visits. The volume of excrement created by the pigeons was significant and staff would report to us that they had regularly informed facilities of the problem. My understanding is that facilities had previously tried to address the issue of high numbers of pigeons nesting around the site. The IPCT had not been aware of the extent of the problem until investigations into the Cryptococcus cases started.

126. The plant rooms were inspected by Dr Inkster and facilities staff and significant pigeon excrement was found. My understanding is that some was dry indicating it was old, and some was wet, indicating it was new and pigeons were still accessing the area. The ventilation as a mode of transmission became one of the main hypotheses. We also considered windows which may have not been properly sealed and questioned staff to understand if the patients had been taken to the main foyer of the hospital for any reason where there could have been an exposure risk. We considered the downdraft resulting from the landing of the emergency helicopter on the hospital roof. We hypothesised that it may have unsettled fungal spores and forced them into clinical areas allowing inhalation by patients. We sought out any areas of soil which patients may have accessed but none were found.

127. There was recognition of the fact that Cryptococcus can lie dormant and these cases may have demonstrated reactivation of the virus having acquired it some time prior to hospital admission. One of the patients had been in hospital in England some time prior which may have been a possible source and this was recognised by the IMT. Noting these points however it was difficult to ignore the time, place and person association between the two cases on the QEUH site. I feel it was only right that this was fully investigated and all possible links to the hospital explored.

128. Remedial action began, which focussed on decontamination of the plant rooms and all areas containing pigeon excrement. I believe an external company was procured to try to control the pigeon numbers on the site however I am not familiar with the details of this.

129. The IMTs held to investigate the Cryptococcus were becoming heated and Dr Inkster as the chair continued to be challenged extensively on her views that this may have been associated with the ventilation. I recall Tom Steele challenging Dr Inkster many times and my impression was that the questions posed were a result of pre meetings in advance of the IMT. As previously

noted, it did not feel like a supportive environment and the views of Dr Inkster appeared not to be respected.

130. My understanding is that there were cases of mucormycosis being investigated by the IPCT on the adult site around the same time. I believe there were two cases. Mucormycosis is also a type of fungal infection which progresses rapidly. I know very little about the detail of these cases.

131. The Cryptococcus incident and the cases of mucormycosis were both reported in the media and I think this fuelled the tension at the IMTs. They were further evidence of possible concerns with the hospital environment. I found the IMT very difficult to participate in by this time. I did not feel that the views of the IPCT were well received, and tension just kept building. There was little feeling of teamwork to explore the hypotheses. Anxiety amongst clinical staff and parents had increased significantly again.

132. It had been agreed to install portable HEPA filter units in ward 6A to increase the ventilation specification. These were added to every patient room and all other clinical areas. Air sampling was performed to test their efficacy. The particle counts were high and Dr Inkster and Dr Peters undertook another inspection of ward 6A. The seals around showers were breaking down and water ingress was a problem with black mould evident under flooring and behind the wet wall. It was agreed that some of the shower areas required wall replacement. The remedial works required decant of each patient out of their single room again, one by one and it was a slow process.

133. On visiting the ward around this time, I spoke with a contractor who was replacing the wet wall in an en-suite area. He described the back of the shower as being like Weetabix. It was just crumbling in his hands. He said that water resistant Gyproc had not been used in the en-suite area. I do not recall the name of the contractor or know which company he was from. I reported this to estates colleagues and at IMTs being held around that time.

2019 Onwards

134. A further decant of patients from ward 6A to the Clinical Decisions Unit (CDU) within the RHC was required. This was relatively short term, I recall around seven to ten days, and allowed repairs to be undertaken to shower areas in ward 6A. I cannot recall the process undertaken to select CDU as the decant area however inspections were undertaken of the area prior to the decant.

135. Following repairs to ward 6A the patients returned and were still on ward 6A when I left to take up my role in ARHAI Scotland. I do recall the number of GNB had reduced somewhat however a lot of controls remained in place including POUFs, HEPA filters and enhanced visits from the IPCT accompanied by facilities staff to ensure a quick response to any defects identified.

Impact on Staff

136. It is my impression that the impact on the staff was significant. I know from many conversations with staff who worked across wards 2A and 2B that they found it stressful and worried about harm coming to patients. Time spent responding to the incident was time taken from caring for patients.

Impact on patient and families

137. It was evident from information shared at IMTs that the impact for patients and families was significant and cannot be underestimated. As a parent myself, it was impossible not to think of the effect it was having on both the children and their families. They were fully reliant on the clinical team and the hospital to keep them and their child safe and yet their confidence in the hospital environment had been eroded.

Personal Impact

138. The personal impact on myself cannot be compared to that of the patients who acquired infections or the parents who had to endure the pain of watching their children suffer. I enjoyed many years working within IPC in NHSGGC. I enjoyed working in the paediatric setting and I enjoyed working with the clinical teams and felt I had established good relationships with them. However, the pressure that was associated with supporting these incidents was intense and relentless for the entire time period spent at RHC. I worked a lot of overtime which was a detriment to my own family life. By the time I had commenced my role in ARHAI Scotland I feel a significant degree of my confidence had been eroded having spent more than two years unable to resolve the infection rates. In hindsight I feel this could have been negated by a more open and transparent culture within NHSGGC.

Closing comments

139. From an infection prevention and control perspective, the challenges associated with the built environment were not in keeping with the expectations of a new build facility and it is my opinion that the built environment contributed to infections. When compared with my time spent working on older hospital sites, the frequency and severity of issues reported in relation to the built environment was significantly higher.

140. The complexity of the faults associated with the water and ventilation system are for the Public Inquiry to explore however it is my opinion that the approach to exploring the hypotheses associated with incidents and with findings from investigations was not cohesive, transparent or supportive.

141. I believe that the facts stated in this witness statement are true. I understand that this statement may form part of the evidence before the Inquiry and be published on the Inquiry's website.

Scottish Hospitals Inquiry
Witness Statement 2 of 2
Susan Dodd
Nurse Consultant, Infection Prevention and Control, Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland

Statement

1. This statement relates to my employment within National Services Scotland (NSS), Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland and matters associated with the Scottish Hospitals Inquiry. My employment with NSS ARHAI commenced in August 2019 and I remain employed by NSS at the time of writing.

2. I have provided a separate statement pertaining to matters associated with the Scottish Hospitals Inquiry whilst I was employed at NHS Greater Glasgow and Clyde (NHSGGC) between 2008 and 2019.

Cryptococcus Sub Group

3. An incident management team (IMT) was convened in response to two cases of Cryptococcus isolated from two patients over the same time period associated with the Queen Elizabeth University Hospital (QEUH) campus. One of the outputs of the Cryptococcus IMT was to commission a separate sub group to explore each hypothesis and produce a report detailing the findings. Dr Inkster as chair of the IMT did not sit on the sub group. The intention was that the final report would be issued to Dr Inkster as chair and the IMT would re-convene to consider the findings. I am not aware whether Dr Inkster has received a copy of the report to date.

4. The sub group was chaired by Dr John Hood, a consultant microbiologist in NHS Greater Glasgow and Clyde. My understanding is that Dr Hood was involved in the design of the West of Scotland Cancer Centre (WoSCC) bone marrow transplant (BMT) unit. I recall discussions with Dr Hood and Dr Inkster

regarding the Cryptococcus incident during the period of the IMT investigations. At that time, Dr Hood appeared to share the concerns of Dr Inkster and I regarding 2 cases at the same time, on the same site and a possible link to the hospital environment.

5. The subgroup met over the course of two and a half to three years. Meetings were held every few months to consider findings. I was not a member of the sub group whilst employed in NHSGGC. Members from NHS GGC included Tom Steele, Sandra Devine, Colin Purdon and Daryl Conner. Colin and Daryl were representatives from the estates team. Peter Hoffman was also a member of the group and considered an expert in healthcare ventilation. Annette Rankin was the Nurse Consultant representative from ARHAI Scotland and Ian Storrar was the HFS representative. Following my appointment as Nurse Consultant at ARHAI Scotland in August 2019, I supported Annette Rankin and attended some of the meetings. I was present for some of the meeting discussions and commented on several drafts of the report.

6. Myself, Annette and Ian submitted extensive comments and feedback on the report. Some related to the evidence being used to support statements. There was no understanding by me, or as far as I am aware by the rest of the group, as to how the evidence papers had been selected or the methods used to review them. Some of our feedback related to the writing style noting the report felt inconsistent and difficult to follow. Following discussion with ARHAI colleagues, we offered scientific support to undertake an evidence review using a robust methodology. NHSGGC did not accept our offer of scientific support at that stage. Over 70 comments were submitted in reference to the report and meetings were held to discuss comments. NHSGGC accepted the offer of ARHAI Scotland to undertake a literature review on 21 May 2021. Following discussion with senior members in NSS and NHSGGC, it was agreed that the report would be finalised as a NHSGGC report only and would not be endorsed by NSS.

7. There were also 2 additional cryptococcus cases from 2018 noted in meeting action notes as having been identified from lab results in NHSGGC. These cases had not been discussed at the meeting to which the action notes pertained. I advised the chair that I was concerned that these cases had been noted in action notes despite there having been no prior discussion. I sought clarity on the details of these additional cases and was very concerned that no surveillance/epidemiological data had been presented to provide an understanding of their significance. ARHAI Scotland did not receive details of these cases.

8. I believe that the facts stated in this witness statement are true. I understand that this statement may form part of the evidence before the Inquiry and be published on the Inquiry's website.

Scottish Hospitals Inquiry
Witness Statement of Questions and Responses
Melville MacMillan

This statement was produced by the process of sending the witness a questionnaire with an introduction followed by a series of questions and spaces for answers. The introduction, questions and answers are produced within the statement.

Personal Details and Professional Background

1. Full name

A. Melville Russell MacMillan.

2. Occupation

A. Operational Estates Manager.

3. Qualification(s)

A. MSc Building Services Engineering / BEng Building Services Engineering.

Please provide information in respect of the following:

4. Professional role(s) at NHS GGC

A. Operational Estates Manager.

5. Area(s) of the hospital in which you worked/work.

A. QEUH Campus.

6. Role and responsibilities within the above area(s)

A. Operational Estates Manager. responsible for daily breakdowns reported on FM System (electronic reporting system used by all departments to log faults and breakdowns) allocated to Estates technicians and Contractors (if required). Queen Elizabeth University Campus only

Specific Role(s) at NHS GGC

7. When were you appointed to your role(s)? How did you come to be appointed, who selected you, what was the selection process, did you have previous working relationships with those who selected you?

A. November 2014. Applied for the position of Estates Duty Manager. Ian Powrie and Alan Gallagher. Yes, through my supervisor and manager at IRH.

8. Go through each of your roles in turn held in Estates at the QEUH: Describe the role.

A. Estates Duty Manager (working a shift rota) November 2014 to April 2018, Day shift Operational Estates Manager April 2018 to present day.

9 What were your duties in this role?

Operational Estates. At that time, I was line manager of a shift team responsible for allocating workload through FM First and telephone requests from the helpdesk

10. Who did you report to in this role? Detail superiors/superiors for this role.

A. Ian Powrie / Andy Wilson / David Brattey / Colin Purdon / Darryl Conner.

11. What was your relationship like with your supervisor in this role?

A. All good with the exception of Ian Powrie. I had no supervisor and at the time Ian was my direct line manager. He was micro manager who did that to the whole team.

12. Can you give me an example of micro manager.

A. He would come In and tell you to get a job done and give you two minutes to do. He was the boss he ran the show, and you have to it in the time he gave you and if you didn't there were questions were asked and questions had to be given. That was everyone on the team not just me. No autonomy to do our job.

13. Would you say as a result of Ian Powrie attitude that effected the team's performance.

A. That's an unfair question because we worked very had as a department above any beyond any other department in my opinion. Wouldn't you say it's reasonable to assume due to the manager attitude it would affect the team performance. For me I did speak to him but then I stopped. I didn't have to speak to him to do my job. He didn't get involved in the shift patterns. I had a couple of managers above me David Bratty Colin Purdon they were my line managers when I moved to shifts and Ian was in charge of them, so I reported directly to them.

14. Provide details of staff who reported to you, and you were responsible for in this role, and your relationship with them.

A. Estates Technicians / Contractors (good working relationship).

15. Provide the name and role of any managers you worked with. Please provide their job (s) and role responsibilities.

A. Estates Duty Managers (Paul McAllister, James Guthrie, Tommy Romeo, and Darryl Conner).

16. How was work delegated in the Estates team?

A. Manager's work delegated by Ian Powrie / Technicians work by the supervisors and managers.

17. How did you check that the work delegated had been carried out?

A. FM First, visual and verbal check.

18. Did you have any concerns about any member of staff or management? If so, please describe these concerns. What action, if any, did you take in relation to these concerns?

A. Ian Powrie (micromanaged from the very beginning and wouldn't listen to technical advice). Ian micromanaged the whole department. Ian would not listen, and everything had to be done his way. I spoke to him directly one day and there after relationships were strained. I prefer not to talk about the situation at the time.

19. Describe the interpersonal relationships within the Estates team. How would you describe communication between you and your supervisor(s)/ superior(s)? How would you describe communication to you from those who were senior to you/ supervised you?

A. On the whole relationships were good with the exception of Ian Powrie, he never spoke for best part of 2-3 years after a heated discussion in his office one day, which is mentioned in Q16. I am really not comfortable talking about this as this was not a great time for me personally.

20. On how many occasions, if any, did issues arise caused by misunderstandings or poor communication? Please provide details of any such instances.

A. I think as a whole the team work well, however in all workplaces there are times where things are misunderstood or not relayed in a timely manner. I do not think this was any way different to other areas.

21. How many people worked within QEUH hard facilities management when you started? How many people worked within QEUH soft facilities management when you started? Did the number of people working at QEUH change during your time there? If so, how many people changed in soft facilities management? If so, how many people changed in hard facilities management?

A. Approx 75-80 people, however I would not know this detail. I had 4 or 5 on a shift at any one time and these were who I managed. I was not responsible for the day shift.

22. How did Estates management operate on a daily basis? Was responsibility shared between different teams? If so, to what extent was responsibility shared?

A. At this time, it felt like we were firefighting due to the new site opening. The work was split between day shift managers/dayshift supervisors and operational duty estates managers.

23. **Refer to the Estates Communications Bundle, document 29 - Organograms showing the organisational structures within QUEH.**

a) Do the organograms match the organisational structures of QEUH?

A. I have never seen this document before.

b) If not, why not?

A. NA.

c) How did the structure and hierarchy operate across the different sectors?

A. No Idea.

24. Estates Staff and Training: What do you know about the staffing levels in estates at the point of handover? Where did the staff come from? Were they mainly transferred from the old site? Were there any concerns about staffing and workload management?

A. Staff came from the old site and the other hospitals that the QEUH was replacing. Insufficient staff were employed to run the QEUH campus. Workload was very extensive. Can you expand. As far I believe the staff we had was half the number of we needed. I think IP did ask for more staff as it wasn't given.

25. What training did you receive or undertake for your role(s) in estates?

A. I received various one day training courses on Building Services Engineering systems installed within the QEUH, also a training course for AP HV.

26. What qualifications did you have for your role(s) in estates?

A. Fully qualified plumber and heating engineer (Advanced Crafts City and Guilds) and HNC in Electrical Electronic Engineering and was attending University for my BEng BSE.

27. What experience did you have working in estates prior to the QEUH/RHC? How similar was the industry, role, and responsibilities to your work in QEUH/RHC estates?

A. Estates L8 Technician Plumber at IRH.

28. Did you have any formal training or qualifications in respect of:

a) Water

A. Yes, full plumbing apprenticeship (see 24). Competent Person training (Legionella L8 City and Guilds Accredited) while working at IRH.

a) Ventilation

A. No.

b) Infection Control

A. No.

29. If so, please detail any training and qualifications – when trained? When qualified? Who was the awarding body? Please describe how the training and qualifications applied to your work at QEUH.

A. Apprentice Plumber and Heating Engineer (Charles Kerr and Son, Greenock) from 11/10/82 to 10/10/86. City and Guilds London Institute (Craft Certificate 83/84) and (Advanced Craft 84/85). I worked on all systems Mechanical / Electrical on the QEUH Campus due to past work experience and qualifications.

30. Do you know if appropriate training was in place for new and existing staff on using the new systems and working within the QEUH? How was it ensured that staff were appropriately trained?

A. The training received was minimal, just a rough description of how the systems worked. Training sessions were held, and staff were told to attend as per training schedule from Brookfield and NHS.

31. Who was responsible for providing staffing? Who was responsible for ensuring staffing was maintained at sufficient levels?

A. GGC NHS senior management.

32. Did you ever have any specific roles or duties in relation to the water systems operation or maintenance within NHS facilities? When did you have these roles and duties?

A. Yes / before opening of the Hospital.

If you did:

a) What were these responsibilities?

A. Water Sampling.

b) What was the purpose of these responsibilities?

A. Water Quality.

c) Were you aware of any specific legal responsibilities/ obligations relating to working with the water systems? If so, please detail.

A. Yes, SHTM 04-01 Part A and B (from my previous employment at IRH as a CP for water)

33. If you did not have any such roles or responsibilities in relation to the water systems operation or maintenance within NHS facilities:

a) Who did?

A. Ian Powrie.

b) What were these responsibilities?

A. Ian was the Senior Manager Estates which covered the whole site and ran the estates department. I am unsure what these specific responsibilities were as this was not part of my role.

c) What did you understand the responsibilities to be?

A. Department Lead at QEUH Campus.

d) Were you aware of any legal obligations/ responsibilities? If so, please detail.

A. Yes, SHTM 04-01 Part A and B.

34. Did you ever have any specific roles or duties in relation to the ventilation systems operation or maintenance within NHS facilities? When did you have these roles and duties?

A. Yes (2016 -2020 maintenance and breakdowns), 2020 AP Ventilation.

35. If you did:

a) What were these responsibilities?

A. Permits to work on AHU and Ventilation Systems Post 2020.

b) What was the purpose of these responsibilities?

A. Ensuring works were completed as per SHTM 03-01 parts A and B.

c) Were you aware of any specific legal responsibilities/ obligations relating to working with the ventilation systems? If so, please detail.

A. SHTM 03-01 – Ventilation for healthcare premises (Part A - Design and validation) and (Part B – Operational management and performance verification).

36. If you did not have any such roles or responsibilities in relation to the ventilation systems operation or maintenance within NHS facilities:

a) Who did?

A. Ian Powrie

b) What were these responsibilities?

A. Ian was the Senior Manager Estates which covered the whole site and ran the estates department. I am unsure what these specific responsibilities were as this was not part of my role.

c) What did you understand the responsibilities to be?

A. Department Lead at QEUH Campus.

d) Were you aware of any legal obligations/ responsibilities? If so, please detail.

A. SHTM 03-01 A and B.

37. Have you ever worked on a large-scale water or ventilation system before? If so, when was this? How did this compare to working on QEUH? What was your role and duties?

A. Yes, IRH domestic water systems as a Plumbing Technician. From 1990 to1998 and 2011 to 2014. They both have the same systems; however, Inverclyde Royal is a much smaller hospital and has a comparable water system.

38. What was the working environment like when QEUH opened – work life balance/ workplace culture? What issues, if any, were you aware of? What was your experience of this?

A. Working Environment was challenging (new hospital), long hours worked learning all the various systems, Micromanaged by Ian Powrie.

39. What were you told about who was on site to manage and assist with carrying out works relating to equipment? How did this assist workload in estates? To what extent, if any, was there a reliance on commercial third parties such as Multiplex when it came to staffing levels?

A. Various specialist equipment contractors were available who were on site to ensure equipment was operating correctly i.e. Swiss log. Staffing levels were and always have been on the low side for the Estates department.

40. What was your relationship like with infection control? Did you have any particular issues with infection control? If so, what issues? Did you have any issues with individuals within infection control? If so, please provide details. Please also provide details of the general relationship between the estates team and infection control.

A. In the beginning / opening of the hospital I had no knowledge or relationship with Infection control, however through time I have built up a good working relationship with this department. This is common when working with a new team and we now have a good open relationship with good communication.

Handover of the QEUH/RHC

Documents, paperwork, and processes in place as of 26th January 2015

We know that handover of QEUH occurred on 26th January 2015:

41. What contractual documentation did you expect to see in place at handover?

A. Completion certificates, commissioning documentation, ppm schedules.

42. We understand that on 26 January 2015, you were an Estates Duty Manager.

a) What was your initial instruction in respect of the state of the QEUH/RHC campus?

A. Initial instruction was it was fit for purpose.

b) What relevant paperwork were you provided with relating to the QEUH/RHC Campus?

A. None out with my remit.

c) What were your observations in terms of the extent of any remedial work required to the hospital?

A. Contractors were still working on systems and structures within the hospital once it had opened.

d) What were your observations in terms of the team dynamics?

A. Overwhelmed with the size / considerable workload and a lot of stress. We Were all determined to make the hospital a welcoming and safe space for patients, visitors, and staff alike.

43. Consider the following questions:

a) What was your initial instruction in respect of the water system at the QEUH/RHC? Who provided you with this information? Was there an official handover process? If so, who conducted this and was there paperwork involved?

A. Day course on the water systems (Mercury Engineering) and a lot of time spent walking around the site getting familiar with the water systems / domestic and mechanical.

b) What was your initial instruction in respect of the ventilation system at the QEUH/RHC? Who provided you with this information? Was there an official handover process? If so, who conducted this and was there paperwork involved?

A. There was no instruction we done a Day course on the ventilation systems (Multiplex) and a lot of time spent walking around the site getting familiar with the equipment and its location.

c) What was your initial instruction in respect of the infection control at the QEUH/RHC? Who provided you with this information? Was there an official handover process? If so, who conducted this and was there paperwork involved?

A. No knowledge that I can remember.

d) What relevant paperwork were you provided with relating to the operation of facilities and estates at the QEUH/RHC?

A. None that I can remember.

44. What, if any, information were you given, or documentation did you see relating to isolation rooms and the issues pertaining to them and remedial works carried out/required?

A. None that I can remember.

e) What are Pentamidine Rooms?

A. Negative pressure treatment room.

f) Your understanding of the purpose of these rooms?

A. To treat patients who are immunosuppressive.

g) The guidance applicable to these rooms for water and ventilation?

A. No guidance I know off it's a specialised design.

h) Were you aware of any issues with the specification of these rooms in 2015?

A. No this was not within my remit.

Refer to Estates Communications Bundle, documents 38 and 78.

Risk Assessments at Occupation

45. Are you aware if a risk assessment was carried out at handover in respect of the water system at the QEUH/RHC?

A. Yes.

46. If so, when did you become aware of this risk assessment?

A. 2015.

47. What documentation have you seen in relation to this risk assessment?

A. None.

48. **DMA Canyon Reports**: **Refer to SHI Bundle 6 – Miscellaneous documents – documents 29 and 30.**
Have you seen these reports before?

A. Yes, however not in any detail. No, I do not have a view on this as I was not an AP until 2018

49. **2015 DMA Canyon Report**

a) When did you first become aware of this report?

A. 2015.

b) Who made you aware of this report?

A. Ian Powrie.

c) Are you aware of why a risk assessment was not undertaken prior to handover in 2015?

A. No.

d) Do you have a view on why this might have happened?

A. No.

e) How did you become aware of this report.

A. I was in a meeting with Jim Guthrie and IP David Watson and Alan someone from DMA to discuss flushing of the system. The document was on the table, and I saw it at the meeting but was not given sight of it. I know DMA give IP 3 copies of it at some point because chatting with David, he mentioned it. I didn't see it until 2018. I didn't know what action was taken or recommended in the report. There was a DMA report of 2017 were you aware of the report and what was in it. Thomas Romeo had asked them to produce this report which was described as a gap report. It wasn't in my remit to act on any recommendations in this report. I dealt with reactive works that came to me on the system and I would give these to my people or get a contractor. That was my remit.

f) The report makes several recommendations; do you know what was done to follow up on these recommendations between 2015 and 2017?

A. No as a shift manager was out with my remit.

g) Do you know if/when the works suggested in the 2015 report were actioned?

A. No again out with my remit.

h) What is your own view of the findings of the 2015 report? Do you agree with them? Please explain your reasons.

A. I cannot recall seeing the document at that time.

i) The 2015 report highlights several actions required to be taken. Are you aware how these actions were managed by estates? If so, please provide details of the management of the recommended actions.

A. No as I was not an authorised person for water at this time and cannot comment.

50. **2017 DMA Canyon Report**

a) When did you first become aware of this report?

A. 2018 – 2019.

b) Who made you aware of this report?

A. Colin Purdon.

c) Do you know what works, if any, recommended in the DMA Canyon report of 2015 were carried out prior to the 2017 report?

A. No.

d) What was the impact, if any, of the failure to implement the 2015 recommendations on patient safety?

A. I was not an AP water until 2018.

e) We understand that Infection Control were only advised about the 2015 DMA Canyon Report in 2018. Do you know why were they not told sooner?

A. No.

f) What actions did you or other take in relation to the report's recommendations?

A. I was not an AP water until 2018.

g) Was the approach taken by Estates compliant with all relevant guidance and legislation at that time?

A. I was not an AP water until 2018.

h) Do you have any concerns about the way in which the water system was managed?

A. I was not an AP water until 2018.

51. What risk assessments have been undertaken in respect of the water system since the DMA Canyon Reports? Please provide details.

A. 2018 / 2022 / 2023 and 2024 RA.

52. Following the DMA Canyon Reports, what water maintenance strategies were put in place? Please provide details of any applicable strategies which were put in place.

A. I was not an AP water until 2018.

53. Are you aware if a risk assessment was carried out at handover in respect of the ventilation system at the QEUH/RHC?

A. No was not put through AP ventilation training until late 2020.

54. If so, when did you become aware of this risk assessment?

A. See question 47.

55. What documentation have you seen in relation to this risk assessment?

A. None.

Design Requirements for Specialist Wards

56. What is your experience in design requirements for specialist wards within a hospital?

A. Guidance from SHTM 03-01.

57. Are you aware of what consideration was given to design requirements for specialist wards within the QEUH/RHC?

A. No, before my time and not within my remit.

58. Are you aware of what the specific design requirements were for the specialist wards in the QEUH/RHC?

A. No .

59. Who would have been responsible for ensuring such design requirements were in place?

A. Multiplex /Vent System Designer / NHS Build and Commissioning Team.

HEPA filters

60. Are you aware if HEPA filters were installed in the relevant rooms at handover (January 2015)?

A. No.

61. What issues, if any, were there with HEPA filters after handover?

A. Not aware of any issues.

62. What information were you given about the use of HEPA filters, their installation, and any previous issues surrounding their use?

A. None.

a) What is the impact of HEPA filters not being installed?

A. Patient safety in high-risk patients.

63. **Refer to IMT Bundle – Document 58**

There are discussions here about sourcing HEPA filters: why was there a lack of HEPA filters?

A. No idea.

b) Why were they required?

A. See 56a.

64. Can you explain the circumstances leading up to this?

A. **Refer to IMT Bundle re. HEPA filters: Documents 57 to 69**

No.

65. **Refer to Document 59:**
Particle counts in Ward 6A came back higher than expected especially with the HEPA filter at maximum, as a result of mould in the showers and water leaking. In this regard:

a) How effective are HEPA filters in managing infection control?

A. It is my understanding Hepa filters are for a higher level of filtration.

b) What, if anything, was being done to address the issue of mould and leaks in the showers?

A. As far as I am aware these issues were addressed when they were raised by staff on FM first.

c) Who was responsible for the maintenance and upkeep of the showers? when were these issues actioned? If they were not actioned, why not?

A. Estates were responsible for maintenance and Facilities responsible for cleaning. I do not know when these rectifications took place.

Chilled beams

66. What are chilled beams?

A. A chilled beam is a type of radiation / convection HVAC system designed to heat and cool large buildings using water and ventilation.

67. Do you have experience of working with chilled beams?

A. Yes.

68. Are you aware of any circumstances/environments where chilled beams should not be used?

A. Areas of high humidity, hospitals / clinical areas / theatres.

a) Can you recall any specific events in relation to chilled beams at the QEUH/RHC? Refer to IMT Bundle to assist.

A. No. I have no recollection of chilled beams dripping on to patients.

For example: condensation/leaking/growth of bacteria/mould
Cleaning of Chilled Beams
Air Sampling/water sampling
Showers in 6A
Action Plan
Patient Placement
Biocide Dosing
SBAR prepared by Dr Christine Peters: Bundle 4, document 37.

For each relevant event, please tell us:

a) What was the issue?

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved?

d) What was the escalation process?

e) Were any external organisations approached to support and advise?

f) If so, what was the advice?

g) Was there opposing advice and by whom, and what was the advice?

h) What remedial action was decided on and who made the decision?

i) Was the issue resolved – consider any ongoing aftercare/support/monitoring.

j) Any ongoing concerns the witness had himself or others advised him of?

k) Was there any documentation referenced during or created after the event. For example, an incident report?

l) Did anyone sign off to say the work had been completed and issue resolved/area safe.

Write your answers above in the relevant section.

A. I have no previous knowledge of this incident.

69. **At Page 166 of Bundle 4,** Dr Peters lists reasons why chilled beams should not be used in neutropenic settings due to the infection risks associated with them, including the build-up of dust and there being a water source from condensation, leaks, and dripping water:
Do you agree with this? If so, can you explain why?
If not, can you explain why?

A. This is not my field of expertise.

Combined Heating and Power Unit

70. What is the purpose of the CHP?

A. System that generates electricity and captures the heat that would otherwise be wasted to provide useful thermal energy for space heating and hot water.

71. Were you advised of the condition of the CHP at handover?

A. No.

72. What information do you have to support your view on the CHP's condition?

A. NA.

73. Are you aware if commissioning and validation of the CHP was carried out prior to handover?

A. No.

a) What, if any, commissioning, and validation documentation did you see?

A. None.

Refer to Estates Communications Bundle, document 90.

b) Who was/is responsible for ensuring that the commissioning and validation documentation was in place?

A. Main Contractor (Multiplex) and Capital Planning (NHS).

c) Where were/are the records of the commissioning and validation for the CHP kept?

A. Zutec.

74. Who was/is responsible for ensuring that the CHP was operating correctly?

A. Capital Planning was responsible during build commissioning / validation. Now the responsibility is joint between Edina (manufacturer) and NHS Estates.

75. If the CHP was not operating correctly, could this impact patients? If so, how? Refer to Estates Communications Bundle, document 101.

A. No. Boilers will come on as the backup system.

76. Have any further issues arisen during your time in estates? If so, please provide details.

A. Yes, dates and times cannot be recalled. Heat rejection not working properly, CHP only running at 50% and electrical issues (not my expertise).

The Water System

Water Guidance and Obligations

77. Was a pre-occupation water test carried prior to occupation? **Refer to Estates Communications Bundle, documents 14, 14.1, 14.2:**

A. Yes.

a) Who carried this out?

A. H&V Commissioning and NHS Estates

b) What was the result of the test?

A. I did not see the results for H&V but seen the results for the NHS which were passed to Ian Powrie for actioning.

c) If this was not done, should it have been done and why?

A. My understanding was that this had been carried out.

d) What are the consequences of not carrying out such a test?

A. No way of knowing the condition of the water systems.

e) Are you aware of the post occupation water testing regime at QEUH? What was it?

A. Yes, Legionella / Pseudomonas and Potable.

f) Was this carried out?

A. Yes.

g) Are you aware of who carried out testing?

A. Estates collected samples (as per Ian Powrie instructions) submitted to Alcontrol lab.

h) If so, how frequent was testing carried out?

A. Rolling program covering different areas as per Ian Powrie s instruction.

i) Did any such testing comply with L8 and SHTM 04-01 guidance? If not, why not?

A. Sampling carried out per Ian Powrie s Instructions

j) What happened to the results?

A. Sent to myself and Ian Powrie. Thereafter Ian Powrie instructed on remedial and resampling.

k) Where were the results stored?

A. Ian Powrie s responsibility.

l) What, if any, action was taken in response to results?

A. Cannot remember.

m) Was there an escalation process? Please provide details.

A. Cannot remember – this is out of my remit as it would not have come to me for action, however, Ian P would have instructed any actions to be completed. I have not been involved with DMA once I took on the shift post when the hospital opened.

n) Why were you partly involved in these results?

A. IP asked me to get sampling done I was told what areas and points to test which I did. I would drop these at the testing centre who would send results to both me and IP after that anything that needed to be done IP would get it actioned it was never me, I never got any of the actions completed. I was only asked to do the sampling and was never involved in any further action after that. I wasn't an AP for water it wasn't part of my remit.

78. Commissioning of water system prior to handover/ patient migration to QEUH:

a) What details, if any, were you provided with relating to the commissioning of the water system upon commencement of your role?

A. None.

b) Who was or would you expect to be responsible for the water system requirements?

A. The Responsible Person as per SHTM 04-01. Not appointed that I am aware of.

c) Are you aware of what, if any, checks were carried out to ensure that the water system had been commissioned appropriately? What checks would you have expected to have been undertaken? What information were you provided with about the water commissioning process at the outset of your role(s)? Refer to Estates Communications Bundle, document 132.

A. No, this was not under my remit.

d) Do you know which teams (such as infection control) were involved in the water system sign off, and who would have signed it off on behalf of those teams?

A. No, this was not in my remit.

e) Are you aware if the L8 testing requirements complied with?

A. Complied with what? I am unsure of this question.

f) Are you aware if there were any Legionella concerns at handover? If so, what were the nature of any such concerns, and what, if anything, was done to deal with these concerns?

A. I was not aware of any concerns.

g) Are you aware of any issues with the testing of the water system? Please provide details of any such issues.

A. No.

h) What was your understanding at the time of the SHTM 04-01 guidance in respect of water?

A. The SHTM's give guidance on how to design and maintain the water system in a healthcare environment.

i) Was the QEUH/ RHC water system SHTM 04-01 compliant at the date of handover – if not, what was outstanding? Who was responsible to ensure that the water system complied with SHTM? What, if any, actions were taken to ensure compliance?

A. This was not in my remit.

79. What guidance applies to water? How did you/others ensure that such guidance was complied with? What contractual documents, if any, would you consult to ensure that the guidance was complied with?

A. SHTM 04-01 parts A to G, however I was not involved with the water management at handover as I was a duty estates shift manager. I only became an AP for water in mid-2018 so have no idea how this was compiled with. I have never seen any contractual documents.

80. What is SHTM 04-01? Please provide details of any issues with QEUH/RHC in this regard.

A. SHTM 04-01 is a series of comprehensive advice and guidance to healthcare management, design engineers, estates managers and operational managers on the requirements, design applications, maintenance and operation of hot and cold-water supply, storage, and distribution systems in all types of health care environments.

81. Who was responsible for ensuring a safe water supply following handover?

A. Water safety group (WSG) led by the Responsible Person (RP) on behalf of the Duty Holder.

82. What was your knowledge and understanding of the Health and Safety regulations on control of Legionella at the time of handover?

A. I was not responsible for water management however I had knowledge of HSG274 and SHTM 04-01 due to my role as a plumbing technician at IRH.

83. Are you aware of what, if any, Legionella training was provided to all maintenance staff, estate officers and contractors? If not, what training would you expect them to have been provided with?

A. I am not aware of any training until I became an AP for water in 2018. I would expect them to have completed the following ‘management AP training’ ‘technician and contractors CPtraining for Legionella L8 accredited course’

84. Are you aware of what, if any, water borne pathogens (other than Legionella) training was provided to maintenance staff, estate officers and contractors? If not, what training would you expect them to have been provided with?

A. No training that I was aware of.

85. Do you know who was the Duty holder at the time of handover? Are you aware of the role/responsibilities of the Duty holder?

A. At the time I did not know who or what the role of the Duty holder was.

Water - Commissioning and Validation (C&V)

86. What commissioning and validation documentation did you see in respect of the pre- handover in 2015? Who would have had sight of any such documentation at the pre-handover in 2015?

A. Not in my remit.

87. Where is the commissioning and validation documentation ("C&V") stored generally on the hospital system?

A. Zutec.

88. What is the purpose of C&V? What are the consequences of it not being carried out?

A. Testing the system to ensure soundness / watertight and operating correctly as per design. May not operate as designed.

89. Were records kept of the cleaning and testing regime? Where were the records kept and what was the retention policy? What concerns, if any, did you have about record keeping and retention?

A. Not in my remit.

90. Describe the same in respect of verification and the cold-water supply system.

A. Not in my remit.

91. What C&V of the water system was carried out post-handover?

A. Not in my remit other than facilitating sampling as described previously under Ian Powrie's instruction.

a) Who was responsible?

A. NA.

b) How was the C&V recorded?

A. NA.

c) Any concerns arising from post-handover C&V? If so, why did these concerns arise?

A. NA.

Water system - general

92. Please provide details of your role as Authorised Person (AP) for Water, including: When you commenced this role? How you came to take on this role? What your responsibilities were? Any specific issues which arose during your time as AP for Water? Any actions you took in response to any such issues?

A. Appointed AP Water in 2018 so had no responsibility prior to this date.

93. To what extent were you consulted or briefed about the specifications of the water system of the hospital before it opened – perhaps by attending meetings or workshops run by the contractors or being sent or shown plans or specifications for particular wards?

A. None.

94. Can you provide details of the Hardgate Road Water Supply which was in place between 2014-2016? Were there any issues with the supply? If so, please provide details including whether these issues were reported, when, to whom and by whom.

A. The supply was connected from Hardgate road water main to after the booster pumps set supplying the hospital, bypassing the filtration units and water tanks. The issue was reported by me and James Guthrie to Ian Powrie on a Friday afternoon (cannot remember date). The pipe work between the two water mains was removed by someone but don't know who did this work.

95. You mention having reported bypass to IP and the pipework between the water mains was removed by someone . Would you be aware of any further action by IP was this removed by his instigation?

A. I wouldn't be able to say that. I know when I came to work after the Friday I checked, and the pipework had been removed. IP must have this actioned this.

96. What testing and maintenance protocols and regimes were in place at handover in 2015? What should have been in place? What remedial actions were taken? When were any such remedial actions taken? By whom were any such remedial actions ordered?

A. Not in my remit.

97. What concerns, if any, were there at handover about the temperature and movement within the water system? Please provide details of any such concerns. How were these concerns recorded and measured? Who was responsible for this?

A. James Guthrie and I were concerned that there was not enough flushing of the water systems by Facilities and Mercury. This point was raised to Ian Powrie.

98. What concerns, if any, did you have at handover about testing and stagnant water being in the system following testing? Please describe and provide information on how this was dealt with.

A. See answer to question 94. It was raised with Ian Powrie and not aware of how this was dealt with.

99. Did you have any concerns at handover about dead ends in the system?

A. Not in my remit.

100. To what extent could the water system in QEUH/RHC have been more comprehensive?

A. Not in my remit.

101. If the water system as installed had been operated correctly, would it have achieved the system objectives? In your answer set out what the system objectives were and how these were/ could have been met.

A. I am not a design engineer.

102. Describe any ward/area specific water systems used?

a) Detail the individual ward water specification?

b) What were/ are your thoughts about this?

c) Why, if applicable, did certain wards have different water systems?

d) Was there a standard protocol for sanitising water systems?

A. Not in my remit at that time.

103. To what extent were the standard protocols for sanitising water systems appropriate for a system of the size and complexity of QUEH/RHC?

A. Not responsible for disinfection and sanitisation of the systems at that time.

104. Were consultants brought in to advise on sterilisation of the water systems?

a) Who were they?

b) When were the brought in?

c) Had you worked with them before?

d) Describe and comment on the methodology that they used.

e) Was that methodology accepted?

f) Did it work?

g) What paperwork or records were kept in relation to their installation, maintenance, or flushing?

h) Were these kept on paper or electronically?

i) What equipment was used for recording work by employees doing day to day tasks?

j) How was the work carried out reported back and checked? By whom was it checked?

A. Not in my remit.

Water Maintenance

105. What was your involvement in relation to the discovery and build-up of biofilm in the water system? What actions were taken to address this? Who was responsible for carrying out these actions?

A. No knowledge of Biofilm in the system.

106. Were you involved in the swabbing/sampling of the biofilm/drains/water system? If so, who instructed you to do this, and what were the results?

A. No.

107. Explain the cleaning and maintenance of the water system, taps, drains, shower heads etc. When doing so consider:

A. None of the below were in my remit.

a) What was the cleaning regime?

A. None of the below were in my remit.

b) What was the importance of this?

A. None of the below were in my remit.

c) What responsibilities did you have?

A. None of the below were in my remit.

d) What did you do to ensure these responsibilities were executed?

A. None of the below were in my remit.

e) What issues, if any, did you have in fulfilling these responsibilities?

A. None of the below were in my remit.

f) Are you aware if concerns were raised about cleaning practices? **IMT bundle, document 22.** Detail these concerns.

A. None of the below were in my remit.

g) What, if any, matters regarding the maintenance of the water system were escalated? If so, were they escalated BICC or AICC? Who were they escalated to? What was the outcome of any such escalation?

A. None of the below were in my remit.

h) What is dosing?

A. None of the below were in my remit.

i) When and why was any dosing carried out to the water system? What was used in any dosing**? IMT bundle, document 30**.

A. None of the below were in my remit.

j) What was the result of any such dosing?

A. None of the below were in my remit.

k) **Refer to Estates Communications Bundle pg. 919** – what was this email about?

A. None of the below were in my remit.

l) Are you aware if routine drain cleaning was not carried out? If not, why not?

A. None of the below were in my remit.

m) Was this normal practice for a building/property of this size?

A. None of the below were in my remit.

n) Clearing of drains in June 2018 following water incident. What was the relevance and purpose of this? **IMT bundle document 27.**

A. None of the below were in my remit.

o) Are you aware if the actions taken resolved the issue? **IMT bundle, document 38?**

A. None of the below were in my remit.

p) Do you know if expert advice was required? If so, why and from whom was it sought?

A. None of the below were in my remit.

q) What happened in response to concerns about on-going maintenance and cleaning? What further action did you take personally?

A. None of the below were in my remit.

r) What, if any, further steps should have been undertaken? Why?

A. None of the below were in my remit.

108. Were you involved in the decision to proceed with any drain surveys? If so, can you explain your role in this decision? What was the purpose of the drain survey?

A. I was not involved in drain surveys.

109. What were the results of the drain survey?

A. NA.

110. Debris, including sponges, were found in the water tanks. What is the significance of this, if any, in relation to the wider issue of water contamination?

A. Possible contamination, however, these were found in the raw water tanks which are before the filtration units. The purpose of the filtration unit is to remove any micro-organisms to 0.2 microns in this case the water would be safe

111. Concerns have been raised regarding the hospital design and the increased risk of water contamination. What is your view on the increased risk of water contamination in relation to the following:

a) Having a single barrier approach water system, resulting in fluctuating water temperatures

A. Unsure of the meaning of “single barrier approach.”

b) Ensuite bathrooms attached to each room.

A. If patient is bed bound, possibility of non-movement of the water system in the on-suit. Higher maintenance costs.

c) Overprovision of water outlets leading to sink removals?

A. Not aware of this.

112. Were you in the decision to use point of use filters? If so, how?

A. No.

113. Who was responsible for the effective management of and installation of the point of use filters?

A. DMA Canyon installed these under Ian Powrie’s instruction.

114. Did the point of use filters meet the water regulation requirements? Did they have an effective gap between the water level and the filter to prevent contamination?

A. No.

115. Why were the point of use filters not introduced earlier?

A. Not under my remit.

116. How often were you aware of the filters being changed? Were the manufacturer's recommendations followed?

A. Not under my remit.

117. How involved were you in decisions relating to water testing?

A. Not in my remit.

118. If not, who was responsible?

A. Ian Powrie and Teresa Inkster.

119. What do you understand about the management of water testing? What do you understand about decisions on when water testing should be undertaken?

A. Follow the L8 and SHTM for guidance on management and testing of water systems.

120. In her statement Dr Teresa Inkster states *'there was a direction from Mary Anne Kane, who was at senior director level, not to give microbiologists access to water testing results'*:

a) What is your reaction to this statement?

A. Not in my remit.

b) Why did estates direct that microbiologists should not have access to water testing results?

A. Not in my remit.

c) Have you ever been advised not to contact someone/ not to provide water testing information? If so, when? By whom? And why?

A. No.

d) Have you ever refused, or directed others to refuse to provide water testing information requested by microbiologists or infection control? If so, why? Provide as much information for your rationale and the consequences of withholding information.

A. No.

e) Provide information on how you dealt with requests for water testing results from microbiologists and infection control – was all the information requested provided? If so, what was provided? If not, why was paperwork not provided?

A. Don’t remember ever being asked to send results to any other party.

f) Who was responsible for dealing with these requests for information?

A. Don’t know.

g) What was your role in dealing with these requests for information?

A. NA.

h) How were these requests for information managed by estates? What steps did you take?

A. NA.

i) What concerns, if any, did you have with how matters were being handled? If so, what steps did you take in response to these concerns?

A. NA.

February 2016 – Sinks – Ward 2A

In early 2016, a PAG took place regarding the *'Contamination of aseptic pharmacy unit at RHC water supply with Cupriavidus pauculus'* **(Bundle 2, document 3),** a subsequent investigation linked the infection to sink within the Aseptic Pharmacy Unit:

121. Are you aware of this incident? If so, when did you become aware of it? How did you become aware of it?

A. Yes, around 2018, can't remember details of how I found this out.

122. What information, if any, were you provided with in respect of this incident? When were you provided with any such information?

A. Was not provided with any information at the time.

123. What was your understanding of this incident? Why were the sinks replaced at this stage?

A. Was not provided with any information at this time.

124. What, if any, action was taken in relation to this incident? By whom was it taken? When?

A. Do not know.

125. Do you recall any further issues in relation to sinks? If so please discuss, describing your involvement and any action taken in response to any issues.

A. Not to my recollection.

Water incident 2018

126. Please provide details of the concerns as they emerged in 2017 into 2018 in respect of the water issues. Initially focus on your recollection of events as they happened. In relation to the concerns:

A. I was not an AP for water until mid-2018. This incident had already occurred and was not part of my remit at that time.

a) When did the concern arise?

b) Nature of concerns?

c) Possible cause of concerns?

d) What actions were taken in response to the concerns?

e) In your view, how sufficient were these actions?

A. Not my remit.

The following IMTs have been highlighted to assist with this**: IMT Bundle Documents 16-18. 21,24, 26-29, 31-32.**

P. Taps

127. The use of Horne Taps was discussed in the IMTs relative to the water incident. **Refer to IMT Bundle document 18**.
Please confirm:

a) Your understanding of use and function of Horne taps? Are you aware of any issues with these types of taps?

A. TMT with mixed hot and cold water and single cold-water levers. No issues that I am aware of.

b) Who authorised the use of Horne taps? Where were Horne taps used?

A. Part of the design (not in my remit). Through the hospital at clinical outlets.

c) Why were Horne taps selected?

A. Not in my remit.

128. Flow straighteners: when did you become aware that they were non-compliant with SHTM 04-01 guidance? Do you know if they were non-compliant at handover?

A. Not my remit however SHTM 04-01 Part A Page 65 Note 15 state “Rosettes, flow straighteners and aerators have been found to be heavily colonised with biofilm, but their removal can create turbulent flow at increased pressure resulting in splashing of surrounding surfaces and flooring. Current advice is that they should be removed but this should be subject to risk assessment. (With regard to the requirement for plugs, see also the section on baths, sinks, showers, and taps in DEFRA’s (1999) guidance document to the Regulations.)” I would not be able to comment if they were compliant at handover. There was a rolling programme to replace these regularly which is carried out by DMA Canyon.

129. Were new taps replaced in January 2019? If so, why were they replaced? Where were they replaced? What were they replaced with? Was the replacement related to dosing with chlorine dioxide?

A. Yes, decision made by WTG in relation to ward 2A RHC, Markwik 21. Not that I am aware of.

Water Technical Group (WTG)

130. What was the purpose of the WTG?

A. To review and assess water related hazards / incidents and to advice on suitable control measures and remedial actions.

131. What issue/ event prompted the setting up of the WTG?

A. Not involved in the setup of this group.

132. What was your involvement with the WTG?

A. Minimal, only attended on the request of Ian Powrie. I did not give any input to this group . Is it right you got requests from IP to take greater input in these meetings. He asked me to attend but this was 2018 -2019 when I became aware of this group. I was taken off shift s April 2018 started day shifts and did my training to become AP. I was only at these meetings for experience

133. Detail specific work which you carried out in respect of your involvement with WTG, why did you carry out this work, what was the impact?

A. Do not recall any action I was asked to complete.

134. Who was in the WTG, what were their names and their roles within WTG?

A. Unsure.

135. What issues came to light as a result and what action was taken? What were the concerns of the WTG and how did this impact on patients?

A. NA.

136. How did clinical staff and estates get along at these meetings? What, if any, were the points of contention between these groups?

A. NA.

Review of Issues Relating to Hospital Water Systems' Risk Assessment 26th September 2018

Refer to Estates Communications Bundle, document 134.

137. Please provide details of your role as AP for of Legionella Control, including: When you commenced this role? How you came to take on this role? What your responsibilities were? Any specific issues which arose during your time as AP? Any actions you took in response to any such issues?

A. AP Water 2018, I was removed from shift work as a Duty Estates Manager and given the role of AP Water once qualified (summer 2018). Part of the management team of the domestic water systems at the QEUH campus. No specific issues that I can remember, and no actions taken.

138. Have you seen this document before? Are you aware of who commissioned this document? What issues prompted the instruction of this report?

A. Yes, not sure who commissioned this document, no idea.

139. What concerns, if any, did you have about the water system? When did they arise?

A. I was aware of concerns around wards 2A and 2B however I was not responsible for any works in relation to this. I believe they changed the horn taps after independent reports that was retained more than of others. These were change to Markwik taps. They also removed the WC cisterns and replaced with direct flushing valves, and I think although not certain that this was if they leaked behind the panels, it may cause mould. This was Capital Planning

140. Did you raise these concerns? If so, with whom? When? Did others have concerns? If so, who?

A. NA.

141. What was the impact of this on patients?

A. Not clinically trained to answer this question.

142. What works, if any, were carried out in response to any findings in this report? What was the result of any such works?

A. Was aware of works being carried out by Ian Powrie and Capital projects, however had minimal involvement with these projects unless requested by Ian Powrie.

Tap Water- Ward 3C – 2019

143. What were the issues in relation to tap water in Ward 3C?

A. No recollection of any issues.

144. What was your understanding and involvement with these issues?

A. None.

145. What action was taken?

A. Unknown.

146. How were matters resolved?

A. Unknown.

Dr Susanne Lee

Refer to Estates Bundle, Document 131, and Page 930

147. Have you seen this document before? If so, when?

A. No.

148. What was your involvement, if any, with Dr Lee?

A. None I am aware of.

149. What are your views on the recommendations set out in this action plan?

A. This is the first I have seen this document.

150. Do you know if these recommendations were followed and to what extent they were implemented?

A. No.

151. Who was responsible for implementing these recommendations?

A. Don't know.

Other water incidents

152. What other specific events do you recall in relation to water? Do you have any recollection of debris in the water tanks? Refer to IMT Bundle, Document 45 as starting point.
If so, please explain:

a) What the issue was.

b) The impact on the hospital (include wards/areas) and its patients (if applicable).

c) Who was involved.

d) What was the escalation process.

e) What was the result of any escalation.

f) Were any external organisations approached to support and advise.

g) Detail the role and function of HPS and HFS, advise if they were involved and any reports prepared by them.

h) Detail advice given from external organisations; what was the advice, did you agree with it, how was any advice managed/ communicated with others in your team and your superiors?

i) Was there opposing advice and by whom.

j) What remedial action was decided on and who made the decision.

k) Was the issue resolved – consider any ongoing aftercare/support/monitoring.

l) Detail any ongoing concerns you had, or which you were made aware of.

m) Was there any documentation referenced during or created after the event?

n) I.e. an SBAR/ minutes from a meeting – use the bundle provided to assist.

o) Did anyone sign off to say the work had been completed and issue resolved/area safe? If so, who signed off on the work?

A. I was aware debris were found and sent off for analysis by Ian Powrie. DME Canyon went in and cleaned the tanks on Ian's instructions

153. What were the NHS procedures for raising concerns about water or water infections?

a) How were these dealt with by you?

A. Water infections are not my area of expertise, however any concerns raised would have been documented in the water incidents report forms which were started in August 2018.

b) How was it confirmed that they had been dealt with?

A. Completed water incident form with sign off from person carrying out the actions.

c) Do you recall specific incidents, and in particular any that gave you concern?

A. No.

Ventilation

Ventilation - Commissioning and Validation

154. Describe the commissioning and validation process in respect of the ventilation system in the QEUH/RHC.

A. Not in my remit.

a) Who was this carried out by?

A. Not in my remit

b) Who signed off on it?

A. Not in my remit.

c) What commission and validation documentation did you see?

A. Not in my remit.

d) Was there anything from the commission and validation documentation that you have seen which gave rise to any concerns? If so, what were those concerns?

A. Not in my remit.

Ventilation system – general

155. To what extent were you consulted or briefed about the specifications of the ventilation system of the hospital before it opened – perhaps by attending meetings or workshops run by the contractors or being sent or shown plans or specifications for particular wards?

A. Not in my remit.

156. What are thermal wheels?

A. Heat recovery system.

157. Are you familiar with thermal wheels?

A. Yes.

158. What is the purpose of thermal wheels in the ventilation system?

A. Thermal wheels are a rotary heat recovery system situated between the supply and extract systems within an AHU. It is used to recover heat energy.

159. What testing and maintenance protocols and regimes were in place for the ventilation system at handover?

A. Not in my remit.

160. Was it possible to incorporate a comprehensive ventilation system into the QEUH/RHC?

A. Not in my remit / I am not a design engineer.

161. Describe any ward/area specific ventilation systems used?

A. Not in my remit.

162. What are your thoughts about these ventilation systems that were used?

A. Not in my remit.

163. Please provide details of your role as Authorised Person (AP) for Ventilation, including: When you commenced this role? How you came to take on this role? What your responsibilities were? Any specific issues which arose during your time as AP? Any actions you took in response to any such issues?

A. AP Ventilation course completed on 17th January 2020, Appointed on

Specific events in relation to the ventilation system

164. Can you recall any specific events in relation to ventilation?
For example:

a) Issues with the air change rates in Ward 2A?

A. Not in my remit.

b) The Ventilation Group and difficulties establishing this?

A. Not in my remit.

c) Birds Roosting in Plant Rooms?

A. Yes. PR41 in the RHC and PR 121 Adults Hospital. However, I was never involved with any discussions or works in relation to this issue.

d) Smell of Sewage within Theatres and remedial works?

A. Not in my remit, however it's a reminder that the hospital was built beside a sewage plant (Scottish Water). There is a regular smell from the sewage plant which permeates throughout the whole site

In providing your answer, please provide details of:

a) What the issue was?

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved?

d) What was the escalation process?

e) What was the result of any escalation?

f) Were any external organisations approached to support and advice?

g) What was the advice?

h) Was there opposing advice and by whom?

i) What remedial action was decided on and who made the decision?

j) Was the issue resolved – consider any ongoing aftercare/support/monitoring?

k) Any ongoing concerns witness had himself or others advised him of?

l) Was there any documentation referenced during or created after the event? For example, an incident report?

m) Did anyone sign off to say the work had been completed and issue resolved/area safe? If so, who signed off on the work?

165. Throughout your time at the QEUH, what work was undertaken in respect of ventilation and why?

A. Not in my remit.

Specific Incidents

Ward 4B

161. **Refer to Estates Communications Bundle document 62:**

a) What is this document?

A. Ventilation report.

b) Have you seen it before? If so, when?

A. No.

c) Do you know what the purpose was of carrying out a ventilation report in October 2015?

A. No, not in my remit.

d) Are you aware of any issues arising from this report? What, if any, actions were taken following this report? By whom were these actions ordered? By whom were they carried out? What was the result of any such actions being undertaken?

A. No, not in my remit.

e) **Refer to Estates Communications Bundle, document 87** – Do you know why NSS was involved in the issues? Actions taken in response, your involvement.

A. No, not in my remit.

Decision to close wards 2A/B and move to 6A and 4B

162. Discuss the issues surrounding and leading up to the decant of patients from Ward 2A in 2018.

a) What was your involvement?

A. None.

b) What risk assessment and additional measures were put in place to ensure patient safety?

A. I had no involvement in this procedure.

c) What concerns, if any, did you have about where the patient cohort was being moved to? If so, why?

A. NA.

d) Discuss and detail the works done to Ward 2A/B. What was required to be done and why? What was done and when was the work completed? Please include details of your involvement.

A. Not part of my remit. This was works completed by Capital Projects.

e) Any other relevant information.

A. None.

166. Discuss the issues surrounding the ward 2A patients when in occupation of ward 6A. In particular, your views in respect of:

a) Chilled beams

b) Gram Negative Bacteraemia

c) Water filters

d) Ventilation

e) issues/ testing/ escalation/ response/ IMTs/SBARs impact on patients

f) Patient communication

g) Internal escalation - HAIIT scoring

h) External escalation

A. See Q134 – I have no other knowledge than being aware patients were moved to Ward 6A. I had no involvement with Ward 6A.

AA. IMT 30 April 2021 – Serratia Colonisation in NICU, RHC

167. **Please refer to SHI Bundle 1, IMT Meeting Minutes, p 445).**

a) What do you recall about this incident?

A. Discuss Serratia Colonisation in NICU.

b) What was your involvement?

A. Working as part of the Estates team.

c) When and how did concerns first arise?

A. Not in my remit.

d) What Investigations were done?

A. Not in my remit.

e) Was there a hypothesis?

A. No idea as this was not within my remit.

f) If so, was it borne out?

A. No idea as this was not within my remit. This would be clinical and IPC

g) Were any interventions recommended? If so, were they sufficient?

A. Not in my remit.

h) **You are noted at page 451** as confirming that when rooms were being HPV cleaned the vents and drainage system were also cleaned. What is HPV cleaning? Why were the vents and drainage system also cleaned? What is the significance of that action being taken?

A. Hydrogen peroxide vapour (HPV) cleaning, Vents and drainage were cleaned as requested by Infection Control. Cleaning the vents / drains and a full HPV clean was to ensure that the ward area was completely clear of any contamination.

i) Did you consider the confirmed action plan to be sufficient? If not, why not?

A. Not in my remit.

j) What was your view about communication in respect of this incident?

A. Clear and informative.

IMT 24 May 2021 – Serratia Colonisation in NICU, RHC

168. **Please refer to SHI Bundle 1, IMT Meeting Minutes, p 474).**

a) What was the purpose of this meeting?

A. Discuss Serratia Colonisation in NICU.

b) What was your involvement?

A. Working as part of the Estates team.

c) What was your view regarding the report to be prepared by Kerr Clarkson?

A. Not my remit.

d) You are noted at page 477 as stating that the trap should not be moved away from the outlet of a wash hand basis as it could become infected. Why is this? Why was it suggested that the traps be moved? How was your statement received at the IMT?

A. I have no recollection why the question arose regarding the trap being moved away from the WHB, I presume that it was because of the possibility of microorganisms within the WHB outlet and trap. My statement was received well.

e) You are noted at page 478 as confirming that the drains were cleaned when the HPV was complete and new traps were installed. Please provide details of the HPV. Please provide details of why new traps were installed and where they were installed.

A. HPV was explained in question 163 (H), New traps were installed as it was easier than cleaning the old ones, they were installed in the original position of the old traps (direct replacements).

f) Did you consider the agreed action plan to be sufficient? If not, why not?

A. In my experience yes.

g) What was your view about communication in respect of this incident?

A. Clear and Informative.

IMT 2 June 2021 – Serratia Colonisation in NICU, RHC

169. **Please refer to SHI Bundle 1, IMT Meeting Minutes, p 487).**

a) What was the purpose of this meeting?

A. Discuss Serratia Colonisation in NICU.

b) What was your involvement?

A. Working as part of the Estates team under instruction by IPC and Ian with regards to allocating jobs to technicians for altering the drainage system, replacing the TMT taps and completely sealing the internals of the IPS panels.

c) What was your view regarding the discussion at page 489 concerning the cleaning regime for the unit? Were there sufficient resources? Was the proposed plan sustainable?

A. Not my remit.

e) You are noted at page 491 it is noted that you prepared a report on the drains. Why did you prepare this report? You noted that the actions, from an estate's perspective, had been completed. Were you satisfied that everything which required to be done had been? If not, what else do you consider should have been done and why?

A. I prepared a report on the drains regarding codes and practises for the installation of drainage systems within a building. I was sharing my knowledge and experience to the group. Yes, I was satisfied, everything that was required to be done was completed.

e) You are noted at page 491 that installation of a heat sanitising drain should not be done. Who had suggested that a heat sanitising drain be installed? Why? Why were you of the view that it should not be installed?

A. I cannot remember who suggested a heat sanitisation drain be installed, however my view of not installing one was the possibility of making the drainage system more susceptible to the growth of harmful bacteria and microorganisms.

f) Did you consider the agreed action plan to be sufficient? If not, why not?

A. In my experience yes.

g) What was your view about communication in respect of this incident?

A. Clear and informative.

Anything Further

170. Is there anything further that you want to add that you feel could be of assistance to the Inquiry?

A. No.

Declaration

171. I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

172. The witness was provided the following Scottish Hospital Inquiry documents for reference when they completed their questionnaire statement. These are contained within Appendix A

Appendix A

A43299519 – Bundle 4 – SBAR Documentation
A43293438 – Bundle 6 – Miscellaneous Documents
A43255563 – Bundle 1 – Incident Management Team Meeting Minutes (IMT Minutes)
A47069198 – Bundle 12 – Estates Communications
A43144419 – Bundle 2 – Problem Assessment Group Meeting Minutes

Scottish Hospitals Inquiry
Witness Statement of Questions and Responses
Karen Connelly

This statement was produced by the process of sending the witness a questionnaire with an introduction followed by a series of questions and spaces for answers. The introduction, questions and answers are produced within the statement.

Personal Details

1. Name, qualifications, chronological professional history, specialism etc – please provide an up-to-date CV to assist with answering this question.

A. Karen Connelly, HND Hotel, Catering and Institutional Management, I was continuously employed by NHSGGC since 1985 until my retirement in 2020. I held various posts over that period and I have noted the most recent/relevant below. The dates I have noted are based on my best recollection as I have no records to refer to.

In 2006 I was appointed Site Facilities Manager for the Victoria Infirmary and associated hospitals as part of that role I was to be responsible for the commissioning of the New Victoria Hospital however it became apparent that role needed a full-time commitment, and I subsequently became the Commissioning Manager from 2006 until the commissioning was completed in the summer of 2009. I was then asked if I wished to go back to my Site Facilities Manager post or join the NSGH Project Team. I opted to join the Project Team as Facilities (soft) Project Manager and I remained in that role until approximately August 2015 when the role came to an end. I was job matched to the PFI/PPP Contracts Manager with responsibility for the Facilities Operational Management of the New Victoria and the New Stobhill Hospitals based at the New Victoria.

Around March/April 2016 I was asked to cover sick leave at the QEUH for the Site Facilities Manager and moved base to there, although I continued with Managing the PFI contracts. I moved back to the New Victoria Hospital towards the end of 2016. I successfully applied for the vacant post of General Manager, Estates and Facilities for the North/East Sector, and commenced that role in January 2017, based at Glasgow Royal Infirmary.

Towards the end of 2017 I was asked to move to the post of General Manager at QEUH and did so from January 2018. I remained there until sometime in 2019 when I was asked to move back to Glasgow Royal Infirmary where I remained until I retired at the end of October 2020.

2. How did your role in the project team come to an end? Was the project team disbanded at this point? If so, why? Did you feel that this job was at an end at this time?

A. There was no definitive date set for an end to the project team, as the project neared an and handover the members of the team were found other jobs and migrated away from the project. Once the project ended I was still available to facilities to address any questions or issues. I did feel that by the time the team was disbanded the job was at an end.

3. Describe what facilities is. What is the difference, if any, between soft facilities and hard facilities? What skills/ experience or qualifications are required for this role?

A. Hard facilities are estates: the technical side including water systems, electrical systems etc. With soft facilities, the majority of these are catering, portering and cleaning with security car parking. Also included are helipads, service yards, waste disposal, retail units, linen services, and helpdesks.

In terms of skills, my qualifications were in hotels and institutional management. Initially I was a catering manager and then I broadened out to be more of facilities manager. I have 35 years of healthcare facilities management experience.

Professional Background

4. Professional role(s) within the NHS.

A. All my roles within NHS were General Management within Estates and Facilities.

5. Professional role (s) at QEUH/RHC, including dates when role(s) was occupied.

A. Facilities Project Manager 2009 to 2015
Site Facilities Manager approximately March 2016 – September 2016
General Manager Estates and Facilities January 2018 – I think August 2019

6. Area(s) of the hospital in which you worked/work.

A. Facilities cover all areas of the campus.

7. Role and responsibilities within the above area(s)

A. As above, facilities cover all areas e.g. providing, catering, domestic, Portering services.

8. Who did you report to? Did the person(s) you reported to change over time? If so, how and when did it change?

A. When I was Facilities Project Manager I reported to Alan Seabourne, Project Director and Alec McIntyre, Director of Estates and Facilites. When they both retired in 2013, I reported to David Loudon, Project Director who would also be the Director of Estates and Facilities when the Project was completed. I also reported to Mary Anne Kane, who was Deputy Director of Estates and Facilities.

When I was PFI Contracts Manager I reported to Mary Anne Kane, and when I covered for sickness absence at QEUH I reported to Billy Hunter, General Manager.

When I was appointed to GM for the Northeast Sector I reported to David Loudon and/or MaryAnne Kane in his absence, and when I was GM for QEUH I reported to Mary Anne Kane until Tom Steele was appointed.

9. Describe your role as Facilities Project Manager, what were you responsible for, what were your day-to-day duties?

A. Day to day duties were various. My role was soft facilities, so I was looking at things such as designs for kitchens, waste rooms storage and automated guided vehicles. Also, I was part of the commissioning migration for the new laboratory building in 2012, that was part of my remit also. Both soft and hard facilities management were going to be based in the service yard, which was in the laboratory and facilities management building. On a day to day basis I performed many varied tasks.

10. Describe your involvement in any design aspects of the QUEH/ RHC build?

A. I worked with other members of the project team, the One in 200 Project and the One in 50 Project which were named relative to the scale of detail involved within the plans.

The One in 200 Project from facilities perspective would include things such as the main catering dept and equipment, power points within the appropriate kitchen areas, processes in terms of food arrival storage, preparation and despatched for patient meal services. We worked on workflows flows such as those.

The One in 50 Project, an example of that would be dirty dishes in the wash up areas, how they would be processed, how they would be cleaned, workflow storage and all the practicalities of doing all the finer tasks.

The most significant things I would say I worked on in terms of design was the catering dept as there were so many aspects involved. The AGVs were a new process so we had no where to go to look for working examples – we had to design them in – food, waste, linen – this was going to be a huge impact on the hospital because it was so integral to the workings of the hospital.

11. Describe who you worked with on any design aspects of QEUH/RHC build?

A. There were different user groups for every department. As well as members of the Project team there were also members of Nightingale, they were the architects, and catering managers from the Southern General Hospital were also involved. If it was a domestic service matter, then the domestic manager would also be involved. We would always have end users involved in any design groups.

12. Who signed off on the final design? What role, if any, did you have in this?

A. I think it was the directorate of each separate design group who would sign off on the final designs. I would advise on whether to sign off based on the user group being happy with any final design. I was an interface between the user groups and the facilities directorate managers.

13. Describe your involvement in any technical aspects of the QUEH/ RHC build?

A. The majority of what I was involved in were processes. The technical aspects I was involved in were things such as technical specifications for waste disposal machines, also the AGVs which were a technical aspect, also operational fire safety, so we worked closely with the operational fire group who were set up to look at the fire safety technology. I also worked with NHS fire officers to make sure all safety plans were available. I was not involved in any of the technical aspects of ventilation or water within the hospital.

14. Describe who you worked with on any technical aspects of QEUH/RHC build.

A. I worked with representatives from Brookfield Multiplex, as well as representatives from other third parties, for example with the AGVs I worked with Swisslog, who were the AGV providers.

15. What is your knowledge of any technical changes during the build, with details of how technical changes were made throughout the build, and who would have signed off.

A. From a technical perspective I can't remember any major changes being made from point of origin to development. The process was quite specific for

any changes in that it all had to go through the project director, Alan Seabourne. If there was a cost involved it would also have to go through the Chief Executive, who at the time was Robert Calderwood.

16. What can you tell us about the hospital specification and requirements at the time of the build?

A. There were project documents which were called the Board Construction Requirements (BCRs), that was the bible we referred to. They had already been signed off so we had to make sure everything specified in there was adhered to, we were not to vary from those.

17. How were decisions made about the specific requirements for each ward?

A. They were all consulted on and agreed through user groups. An example of this would be that each ward had a domestic services room (DSR) which contained kitchen pantries, waste holds, all had designs on finishes and needed surfaces that could be easily cleaned, so these were consulted on and agreed by user group staff.

18. Describe your role in user groups and what was your involvement. What was the purpose and function of the user groups? Describe who you worked alongside with? Describe your day-to-day duties are responsibilities with the user groups.

A. If it was a facilities related matter I would take the lead as facilities person, but if it was anything else then I would take on a facilities role. In terms of agreeing the final layout and equipment placement, there were many people I worked with. Whoever was involved in the groups would depend on what we were working on. On a day-to-day basis my role was to make sure all the meetings were scheduled and everyone was able to attend. Everyone had their own jobs to do, so I had to a certain amount of co-ordinating to do to make sure all the relevant people were present depending on what the user group was focussing on. Again, this was only from a facilities perspective.

19. Describe your day to day dealing with infection control staff during this period. Were there regular meetings between infection control staff and the project

team? How regularly was input sought from infection control staff by the project team in design matters and the build of QEUH/RHC?

A. There was a member of infection control staff assigned to the project team – this was Jackie Stewart; she was an infection control nurse. Jackie was a member of the time and was there in the office – she was at the majority of the user group meetings I saw her on a daily as she was part of the team. Input was sought regularly from the infection control nurse; they were part of the team and an integral part of the design process.

20. At this time clarify the roles and responsibilities of Currie & Brown, Capita, Mercury, IBI and Multiplex. Describe any involvement you had with these companies.

A. I'm not sure if IBI might be Nightingales the architects? These companies were represented at the user group meetings. Latterly Currie and Brown had officer space with the board project team. Mercury and Multiplex were all based in the same building but on different floors, they would all be represented at the user group meetings depending on what was under discussion at the time.

21. Describe any involvement you had in respect of room data sheets? Process, relevance etc.

A. The room data sheets (RDSs) had all been prepared before the contract was awarded, these were in the board requirements - however we went through them when we were designing the rooms. Some minor things may have been amended if there were no cost implications such as for example, moving a mirror or a socket point etc.

22. What is your understanding of the employer's requirements? What involvement did you have with them and how did they impact your role during this time?

A. I did not have any involvement in writing the employer's requirements up, but we used BCRs as a reference and a baseline for our designs.

23. Describe your understanding at this time of BREEAM. How important was BREEAM in the design and build stage?

A. BREEAM is an environmental standard to be achieved in new buildings to make them as energy efficient as possible in new buildings. They were taken very seriously by the project director as it was an important award for us to get for the building. I would describe bream as being a very important factor for the project director, it was a priority for him to achieve this as an award.

24. Refer to the ZBP Ventilation Strategy Document. Were you aware of the ZBP Ventilation Strategy document dated 15 December 2009? If so, when did you first become aware of it? Why were you forwarded the document? What did you do on receipt of the document? Were you consulted? If so, what were your views?

A. This was sent by Mark Baird from Currie and Brown on 15 December 2009 – I had only just joined the project team at this point. I don't know why he sent it to me, although it was quite common for members of the team to come in to the office and ask us to print out documents for them at the time as our access to printers was limited. I can only guess that this is what happened as I have no knowledge otherwise of the contents of this document.

25. When did you first learn of the Agreed Ventilation Derogation. i.e. that each 2.5 ACH was the agreed rate? When you became aware to which wards did you understand this to apply to?

A. I was not involved in any aspect of the ventilation design.

26. Were your views asked for before the Building Contract was signed in December 2009?

A. No, that would not have been in my remit.

27. If you were aware of it and/or consulted about it, what did you think its scope was? eg. did it apply to all wards in the QEUH/RHC including specialist wards and specialist ventilation and isolation rooms then intended to be included in the hospital, and any specialist facilities to be later added to the hospital before it opened?

A. I was not aware of or consulted about this, it was not in my remit.

28. Describe the handover process between Alan Seabourne and David Loudon? How long did the process take?

A. This was in 2013. I think Alan and Dave had about a month of a crossover. I was not aware of the formal processes of the handover or what they did, all was done within the confines of their roles and offices.

29. Describe your role at this time, responsibilities, day to day duties. Who reported to you, if anyone, who did you work with, did you work with any teams or other professionals at QEUH/RHC?

A. This was after I was on the project team. I went to the PFI October 2015. I reported to Billy Hunter to help out as facilities manager in 2017. I worked there until 2018 when I was moved by David Loudon to the QEUH to be the General Manager there. As General Manager from 2018 my role was GM for Estates and Facilities in the QEUH, I dealt with all aspects of estates and facilities in the QEUH. My two main reports were David McDonald and initially Ian Powrie, but he was replaced quite quickly by Andy Bell. I continued to report to Tom Steele from his appointment until I retired in 2020.

30. Who selected you for your role(s)? When were you selected for your role(s)? Please describe the selection process for appointment to this/these roles?

A. My appointment to Site Facilities Manager at the Victoria Infirmary was made following an interview process. Alastair McLean, GM and David Pace GM were on the interview panel. My appointment to NVH Commissioning Manager full time was agreed by Alec McIntyre. My appointment to QEUH Project Team was agreed by Alex McIntyre. My appointment to the PFI Contracts Manager role was through job matching and Mary Anne Kane and HR as I had no substantive post to return to. My appointment to General Manager was made following an interview process, David Loudon, Mary Anne Kane and a General Manager from a clinical service as well as HR were on the interview panel. My move from GM North to GM QEUH was at the request of David Loudon. My move from GM QEUH to GM North in 2019 was at the request of Tom Steele.

31. Had you worked with any of your QEUH/RHC project team colleagues prior your role(s) at QEUH/RHC? If so, who had you worked with before this current role? When did you work with this/these colleague(s)? What role were you in when you worked with this/these colleague(s)? How long were you colleagues in this/these previous role(s)?

A. I had worked with Heather Griffin, Adult Hospital Project Manager, when we were both based at Glasgow Dental Hospital in 2001. I was the Facilities Manager and Heather was the Clinical Services Manager. Part of my responsibilities was managing the on-site surgical instrument decontamination service, whilst Heather was working on plans for a new central decontamination unit. I provided Heather with information/statistics re instrumentation. I attended meetings with Marie McLeod, Project Manager for the Children's Hospital, during the commissioning of the New Victoria Hospital as Maria had been involved in the design process.

Specific role(s) at QEUH/ RHC

32. What role did you hold up until 2017?

A. I didn't have a specific management role at QEUH until January 2018 when I was transferred there. General Manager as I outlined above.

33. Describe how you came to be appointed to this role?
(No answer provided)

34. What previous working relationships, if any, did you have with those who selected you?

A. (No answer provided)

35. Describe your role and responsibilities (including day to day) at QEUH/RHC post January 2015 when the hospital was handed over from Brookfield Multiplex to NHS GGC.

A. I was the Facilities Project Manager responsible Co-ordinating soft Facilities service migrating to the new buildings, including familiarisation, tracing and induction. Also commissioning the new helipad and working with staff who would be operating the new automated guided vehicles.

36. Describe the commissioning process for the QEUH/RHC in further detail, what did this entail, were you involved in the commissioning of the water and ventilation system If so, how so?

A. I was only involved in the facilities aspects of the commissioning process; the catering, AGVs, helipad etc. I was not involved in the ventilation and the water systems.

37. How did your role change following handover of the QEUH/RHC in or around January 2015?

A. Myself and other members of the project team moved into offices within the building and worked through our project plans to get the building equipped, stocked, cleaned etc. in readiness for the migration of patient services.

38. Did you have any concerns regarding cleaning of the hospital at this stage?

A. That was the handover time from Brookfield to the board. At that time yes, we had concerns re the cleaning of the hospital due to the ongoing work and the completion of the incomplete work by Multiplex. This was hindering the finishing of areas that we were working on. We needed extra resources at that time all the cleaning was done effectively.

39. Where was your role in the hierarchy of the organisational structure at QEUH/RHC?

A. I wasn't on it until 2018.

40. Who did you report to, (name(s) and role(s))?;

A. Depending on what role I had it would have been, Billy Hunter, Mary Anne Kane or David Loudon.

41. Describe your relationship with your supervisor in this role.

A. I believe I had a good working relationship with all managers.

42. When did you start your current role? At this time, how many people worked within hard facilities management at QEUH? At this time, how many people worked within soft facilities management at QEUH? Did the number of people working change during your time at QEUH? If so, how did they change in soft facilities management? If so, how did they change in hard facilities management?

A. I retired in 2020 When I was GM at QEUH 2018/2019 there were several changes in the Estates and the Facilities Management structure, but the overall numbers remained relatively unchanged.

43. How did hard and soft facilities management operate on a daily basis? How were the operations managed? Was responsibility shared between different teams? If so, to what extent was responsibility shared?

A. The General Manager was responsible for all Estates and Facilities Operational matters and below them were two separate structures, one for Estates and one for Facilities. They were all based in Laboratory and Facilities Management Building and while most work streams were separate there was crossover in areas, e.g. the Helpdesk, they also worked together when clean ups were required after maintenance work etc.

44. Refer to the **Estates Communications Bundle, document 29** - Organograms showing the organisational structures within QUEH.

a) Does the organogram match the organisational structures of QEUH?

A. As far as I can remember it matches what was in place in 2015.

b) If not, why not?

A. (No answer provided)

c) How did the structure and hierarchy operate across the different sectors?

A. I understood it to be similar to Estates and Facilities.

45. Please tell us which staff reported to you, and who you were responsible for in this role, and your relationship with them.

A. When I was GM, I had a Sector Facilities Manager and a Sector Estates Manager who both reported to me, and they each had an operational management structure below them.

46. How was communication between you and your colleagues? What communication issues, if any, arose?

A. We held daily team briefs to discuss any issues and as we were all in the same building, we would have informal face to face catch ups, or by email or telephone. I don't remember any communication issues.

47. How did you keep a record of work delegated?

A. There was a note kept of every Team Briefing with actions noted and who was responsible.

48. How was delegated work supervised?

A. An update on the actions had to be provided at the daily briefing session.

49. Which other QEUH teams or departments, if any, did you work closely with?

A. Members of the Estates and Facilities management team attended the clinical team briefs held 3 or 4 times per day. There was the Adult Hospital Brief, Children's, Maternity/ Retained Estate/INS. We also attended regular scheduled meetings re Health and Safety and Infection Control with clinical colleagues.

50. Please describe your working relationship with these QEUH teams or departments (including areas of hospital work on).

A. I believe we had a good working relationship because of our daily meetings with them and we also had 24/7 Facilities Duty Managers available for any wards or departments to raise any issues with.

51. What concerns, if any, did you have about any member of staff? If so, please describe these concerns. What action, if any, did you take in relation to these concerns?

A. I don't remember any specific concerns. If there were any issues they were dealt with in accordance to the appropriate policy or procedure.

52. What concerns, if any, were ever raised about management/ managers? If so, please describe these concerns. What action, if any, did you take in relation to these concerns?

A. As above any concerns raised would have been dealt with appropriately.

Training

53. What formal training or qualifications do you have in of the following:

a) Water

A. None.

b) Ventilation

A. None.

c) Infection Control

A. None.

d) If so, can you go into more depth about any training and qualifications? – (When trained? When qualified? Who was the awarding body?) Please describe how the training and qualifications were relevant to your work at QEUH.

(No answer provided)

54. What specific roles or duties within the Project team have you had in water systems operation or maintenance? How long did you have these roles and duties?

A. None.

55. Were you aware of any specific legal responsibilities/ obligations when working with the water systems. If so, please provide additional information.

A. I did not work with the water systems.

56. If you did not have any roles or responsibilities in relation to the water systems operation or maintenance:

a) Who did?

A. There were appointed or nominated members of the Estates Team who held responsibilities in accordance with the Board's Water safety Policy.

b) What were these responsibilities?

A. I cannot remember.

c) What did you understand the responsibilities to be?

A. I cannot remember.

d) Were you aware of any specific legal obligations/ responsibilities? If so, please provide additional information.

A. There were statutory and mandatory obligations, but I can't remember what they were.

57. What specific roles and duties within the Project Team did you have in the ventilation systems operation or maintenance?

A. None.

a) If you did not have any roles and responsibilities in the ventilation systems operation or maintenance, who did?

A. I don't know I was not involved in Estates matters during my time with the Project Team.

b) What were these responsibilities?

A. (No answer provided)

c) What did you understand the responsibilities to be?

A. I don't know.

d) Were you aware of any specific legal obligations/ responsibilities? If so, please provide additional information.

A. No.

58. What large scale water systems had you worked on before the QEUH? What large scale ventilation systems had you worked on before the QEUH? If so, when? How did this compare to working on the QEUH? What was your role and duties?

A. I have never worked on large scale water or ventilation systems.

Documents, Paperwork and Processes in Place as at 26th January 2015

We know that handover of QEUH occurred on 26th January 2015:

59. What contractual documentation would you expect to see in place at handover?

A. Whatever was specified in the contract.

60. Describe the process for handover of QEUH:

A. I wasn't involved in the handover process.

a) What contractual documentation was in place?

A. I don't know.

b) How was the relevant paperwork handed over to QEUH?

A. I don't know.

c) Describe your involvement in the process for handover?

A. None that I remember.

c) Were infection control doctors and nurses consulted? If so, who?

A. I don't know.

61. Was the building of the QEUH complete at handover – if not, what was incomplete? Was QEUH ready at handover? If not, why was it not ready at handover? Refer to **Estates Communications Bundle, document 3 – 'Stage 3 Adult and Children's Hospital Completion Certificate'** defects noted therein when considering this question.

A. No the building was not complete at handover.

62. What concerns, if any, did you have regarding the building not being complete at handover? Was this has you expected? If not, why not? Did you ever discuss any concerns with other members of QEUH/RHC staff? If so, who?

A. I did have some concerns. I was concerned that the work may not have been completed before the patients migrated, also whether there were going to be people still working in the hospital ect. when there were patients in. Some deliveries of equipment etc. could not be made due to workmen still being in the building still. Ultimately the migration program was completed. We did discuss concerns between ourselves, however we managed to coordinate management of the problems between ourselves and overcame them without having to escalate anything.

63. Describe the site when QEUH/RHC at handover in January 2015.

A. There was still a significant amount of work to be completed.

64. Did Multiplex remain on site? How was this managed, and were records kept of Multiplex staff being on site? If so, who was responsible for this and where were such records kept? Did you have any concerns?

A. Multiplex remained on site. I was concerned about the number of Multiplex personnel were still on site as this impacted on us preparing the building for the migration of services. Multiplex appointed security personnel to the front desk and all Multiplex operatives and their contractors signed on and off the premises. The paper records were kept at the time, but I don't remember for how long they were kept.

65. Did you raise or share these concerns with others? If so, what action, if any, was taken?

A. No – this situation did last for a couple of months, however we managed the situation without having to escalate anything.

66. At handover who was responsible for ensuring that paperwork was produced to confirm contractual compliance?

A. I don't know.

a) Paperwork?

A. I don't know.

b) O&M Manuals?

A. I don't know.

c) M&E Clarifications Log?

A. I don't know.

d) Others paperwork as per the contract?

A. I don't know.

Provide as much detail as possible – was anything missing? If so, how was this managed?

(No answer provided)

67. What commissioning and validation documentation for the water system did you see at handover? What commissioning and validation documentation for the ventilation system did you see at handover?

A. None, as it was not part of my remit.

68. Can you distinguish between commissioning and validation?

A. This was not my remit – however my understanding is the commissioning aspect is to make sure something works, and the validation process is to test something to make sure that that thing works within its expected parameters.

a) What documentation would you expect to be available for both the water and ventilation systems?

A. I don't know.

b) Who was responsible for this documentation?

A. I don't know.

c) What was your role?

A. None.

d) Were you ever aware of commissioning and validation having been carried out?

A. It was not something I expected to be aware of.

e) If not, why were you not aware of commissioning and validation having been carried out?

A. It was not my remit.

69. Describe the water flushing regime at handover, describe your involvement, the recording process, why is it important and impact if it is not carried out?

A. Multiplex were responsible up to handover, but I do not know what records were handed over. After handover I arranged with domestic services manager for the domestic staff to incorporate the flushing of taps in clinical areas into their cleaning regime at the request of the Estates Team. Records were completed by the domestic staff and handed into the Estates office.

70. Was any other paperwork missing at handover? If so, would you consider this missing paperwork to be of importance?

A. I don't know.

71. Operating systems at handover:

a) How many staff were allocated to maintaining operating systems and how was this determined?

A. I don't know.

b) What training was put in place for maintaining the operating systems?

A. I don't know.

c) Who carried out the training? Refer to **Estates Communications Bundle document 5 – 'Brookfield Multiplex Client Training & Familiarisation Register for Ventilation'.**

A. I was not involved in Estates Training and Familiarisation.

d) Were Multiplex involved in the training?

A. I would expect so.

e) Was sufficient training provided to allow staff to operate the systems?

A. I can't comment on this.

f) Please describe the manuals/ documents that were handed over.

A. I did not see them.

72. What was your involvement/ role in the handover process? How did you manage this?

A. None.

73. Who signed the completion certificates?

A. I do not know.

74. Who was the person with the responsibility to sign the completion certificates under the contract?

A. I don't know.

75. Estates Communications Bundle, document 3 – 'Stage 3 Adult and Children's Hospital Completion Certificate':

a) What is this?

A. I have not seen this before.

b) Have you seen it before?

A. No

c) Have you seen other such certificates?

A. No.

d) Who signed off these certificates?

A. I don't know.

e) What checks were carried out prior to sign off?

A. The Board appointed supervisor from Capita carried out the checks. Other members of the Project Team and I were asked to complete a programme of checks shortly before handover. We completed forms and recorded any outstanding or incomplete work.

f) What was your role/ responsibility?

A. We were given a list rooms/areas to check and we then reported our findings back.

76. What concerns, if any, did you have following completing these checks?

A. My main concerns were there was still some work to be completed.

g) Looking at the defects referred to in the completion certificate **documents 3 above: Look also at Estates Communications Bundle, document 4 – 'Capita NEC3 Supervisor's Report (No 46)'**

(i) What are these defects?

A. Incomplete work.

(ii) What was the impact of these defects?

A. They had to be completed after handover.

(iii) Why two years to deal with the defects?

A. I assume that was what was written in the contract.

(iv) Who decided that it was appropriate to accept handover with outstanding defects?

A. I don't know who made that decision.

(v) Is this usual practice in the construction industry?

A. I don't know.

77. Refer to **Estates Communications Bundle, document 8 – 'Programme for handover to start of migration':**

a) Do you know what this is?

A. I have not seen this before.

b) Have you seen it before?

A. No.

c) What are the numerous defects?

A. Incomplete work.

d) What is your understanding of the purpose of this document?

A. To ensure there a record of the defects being rectified.

e) What comments, if any, do you have regarding the number of defects?

A. There were too many of them.

f) To what extent were you aware of this document at handover?

A. I wasn't aware of it.

g) If not, should you have been aware of this document at handover?

A. It would have been informative.

78. How would it have been informative? What matters would it have assisted with and how so?

A. Informative in that I would have known the size and the scale of the incomplete works. Ultimately, we managed to migrate the patients into the hospital. I don't think it would have any impact on how the project turned out.

79. What did the contract say about retention of certain parts at handover? Was this enforced and why?

A. I don't know.

80. To what extent did Multiplex retain responsibility for the build following handover? Did Multiplex give any warranties? What were the terms of any warranty relating to Multiplex's work? How long was the warranty period following handover in January 2015?

A. I don't remember what responsibilities Multiplex still have. I believe the warranty period was for 2 years.

81. How many companies have on-going responsibility following handover? If so, describe the responsibilities of the companies. How long post-handover were the other companies involved for?

A. There were many companies still had responsibilities after handover, some had a 2-year post-handover involvement, some companies still have an input as their equipment systems continue to be used.

82. Please confirm which companies?

A. There were a lot of companies – most were subcontractors from Brookfield: Swisslog, the AGV and pneumatic tube system suppliers. And also Mercury, they were in charge of the mechanical and electrical suppliers so they would have still been on site. We were also still dealing with Capita and Currie and Brown in terms of where the defects were and how they were being closed down.

83. What concerns, if any, did you have about the opening of the hospital after handover? Refer to **Estates Communications Bundle, documents 19 and 21 and 21.1** when answering.

(a) Was there anything missing that you thought should have been constructed/installed? If so, please describe what was missing.

A. There were areas that could not be accessed for cleaning or installing equipment, some systems were not installed/commissioned e.g. PA system.

(b) Which areas could not be accessed? Did you have any concerns about not being able to access for cleaning purposes?

A. There were areas that could not be accessed at specific times. I can't remember specifically now where they were. We were concerned at the time but ultimately we were able to get in and get all the cleaning done that we needed to do.

(c) Did you have any other concerns about areas of the hospital at handover?

A. My concern was how much work that was still to be done and the number of Multiples operatives still on site. This impacted on us being able to keep the site secure and to allow the NHS commissioning and equipping Teams to get on with their work. The domestic staff had to repeatedly clean rooms and areas because further work was carried out after they had cleaned.

84. Refer to **Estates Communications Bundle, document 22** at the point of patient migration Mhairi Lloyd states that there were rooms/ areas 'not yet fit for purpose': Look also to **Estates Communications Bundle, document 19:**

a) Detail your understanding of the concerns – namely what the concerns were any why?

A. From a general perspective it was frustrating not to be able to have assurances that room were complete. We were all working to tight timescale to complete the commissioning work before the migration of clinical services.

b) What was the impact of not getting these assurances?

A. We were all working to tight timescales – ultimately there was no impact because we managed to work around the challenges.

c) Your involvement with the dealing with any concerns?

A. From a Facilities perspective we tried to support the clinical teams by being responsive to their need for services such as portering and domestic.

d) Were matters resolved prior to patient migration?

A. Yes, to my recollection all facilities matters were resolved prior to patient migration.

e) If so, how matters were resolved prior to patient migration?

A. working longer hours engaging more facilities staff and getting rooms into a condition where the clinical staff were happy.

f) At the time, did you consider that matters were resolved prior to patient migration?

A. Yes.

g) Who signed off prior to patient migration?

A. I don't remember the process for this.

h) Were you involved at all?

A. I think this was more from a patient perspective. As the move became more imminent there were patient migration groups set up. I would have been involved in these as a member. They were led by clinical directors such as Kevin Hill and Anne Harkness. They would ask if we were good to go and we would advise from facilities perspective whether we were or not, but purely from a facilities perspective.

85. Detail the snagging process, refer to **Estates Communications Bundle, documents 90 and 91** when considering your answer detail:

a) What happened?

b) How long were Multiplex on-site following handover?

c) Main areas for snagging?

d) Records of works carried out?

e) Sign off – who as responsible and when signed off?

A. I was not involved in this process

86. Refer to **Estates Communications Bundle, document 132** with the benefit of hindsight do you agree with Frances Wrath's comments that all area were commissioned in line with Employer's Requirements?

A. No.

87. Why do you not agree with this statement?

A. I didn't think Frances was in a position to be able to say. I don't think she would have had the knowledge to be able to make that comment.

Wards and Hospital Occupation from January 2015

88. At the point of taking occupation of QEUH/RHC on 26th January 2015 please confirm whether the following wards were fully handed over from Multiplex to NHS GGC:

Ward 2A/2B

Ward 4B

Ward 4C

Ward 6A

Ward 6C

A. I can't remember.

89. Please also confirm your understanding of the ward specification and patient cohort to be located in each ward?

A. Ward 2A/2B were children's oncology wards, I can't remember the rest.

90. If a ward or wards were not handed over on 26th January 2015, or were partially handed over, please confirm:

a) Why were they held back?

A. I don’t remember.

b) Any financial consequence to both Multiplex and NHS GGC of the ward(s) being held back?

A. I don’t know.

c) What works were carried out to allow this ward(s) to be handed over the NHS GGC?

A. I don’t know.

91. Were any other wards, aside from those referred to above, retained? Answer as above.

A. I don’t know.

92. We know that the energy centre was retained by Multiplex.

a) Why was the energy centre retained?

A. Incomplete work.

b) In what way was the energy centre incomplete? Do you recall this being discussed with colleagues?

A. No. I do know that work was incomplete, but I can’t remember being party to any discussion about this. I wasn’t part of anything that was set up to remedy any incomplete work.

c) What financial consequences, if any, arose for either Multiplex or NHS GGC if the energy centre was retained?

A. I don’t know.

d) What works were carried out to allow hand over of the energy centre to NHS GGC?

A. I don’t know.

e) Were any other parts of the hospital retained by Multiplex pending works being carried out? Why? What works required to be carried out prior to them being handed over?

A. I don't know.

f) At the point of handover on 26th January 2015 how satisfied were you that all areas accepted by NHS GGC were designed to the intended specification and suitable for the intended patient cohort, meeting all the relevant guidance requirements?

A. As far as I was aware they were.

g) If not, why were the wards handed over? Were any issues escalated to more senior management/ Board level? Please confirm.
(No answer provided)

Asset Tagging

93. Describe and detail asset tagging:

a) What is this?

A. A system of allocating a unique identifier (tag) to equipment and systems to ensure it is serviced and maintained appropriately.

b) Why is this important?

A. To avoid breakdowns and ensure the lifespan of the equipment is maximised.

c) What role, if any, does asset tagging play in respect of Planned Preventative Maintenance (PPM)?

A. This enables each asset to be identified and programmed into a PPM schedule and therefore ensure that everything is correctly serviced and maintained.

d) Who was responsible for this?

A. I understand that Multiplex were responsible for ensuring all equipment was tagged.

e) What was the impact if this was not done?

A. Possible breakdown of equipment due to incorrect maintenance.

f) What concerns, if any, did you have about this?

A. It was an estates matter and not my remit at the time.

g) Did you escalate these concerns? If not, why not?

A. It was not my remit at the time.

h) Discuss any issues regarding asset tagging and how you managed this?

A. I had no discussions at handover, but it was still an issue in 2018 when I became General Manager at QEUH.

94. Was there a contractual requirement to provide CAMF?

A. I don't know what CAMF is.

a) Again, what is the purpose of this and who was responsible for providing this?

A. I don't know.

b) What is the purpose of CAMF?

A. I don't know.

c) How does ZUTEC differ from CAMF?

A. I don't know.

d) Should both CAMF and ZUTEC have been provided at handover?

A. Zutec yes, I do not know about CAMF.

(i) Who was responsible for ensuring provision of CAMF and ZUTEC?

A. Multiplex.

(ii) What were the consequences of these not being provided?

A. Building user manuals, maintenance records etc would not have been available to the Estates team.

(iii) What action was taken to remedy matters? Were Multiplex contacted?

A. I don't know.

95. Provide information on any issues in relation to CAMF and ZUTEC

a) Operation?

A. I don't know.

b) User suitability?

A. I don't know.

c) Any other matters?

A. I don't know.

d) Who was this reported to, what action was taken to remedy matters?
(No answer provided)

96. Did your team or NHS IT develop a system for asset registration?
If so, when, and how long did it take following handover.

A. I understand that the Senior Estates Managers were involved in this.

HEPA Filters

97. Were HEPA filters installed in the relevant rooms at handover (January 2015)?

A. I don't know.

98. What issues, if any, were there with HEPA filters? Refer to **Estates Communications Bundle, document 22.**

A. I was not involved in this.

99. If so, what issues were you aware of?

A. I don’t know.

100. Dr Gibson in her statement refers to HEPA filters not being in place at the point of handover in wards 2A/B.

a) To what extent, if any, do you agree with Dr Gibson’s statement above concerning HEPA filters?

A. I am not qualified to answer.

b) What was the impact of HEPA filters not being installed?

A. I am not qualified to answer.

c) What was the potential patient impact of the absence of HEPA filters?

A. I am not qualified to answer.

d) Do you recall there being agreement during the design and build stage, that HEPA filters would be omitted form Ward 2A/B? Please explain your answer.

A. I was not aware of any agreement.

e) What was done to resolve any HEPA filter issues?

A. I don’t know.

f) What filters should have been installed at handover?

A. I don’t know.

g) Who was responsible for providing HEPA filters and ensuring that they were installed during the build?

A. I would assume it was Multiplex.

h) Who signed off handover without HEPA filters being installed?

A. I don’t know.

i) Were infection control doctors and nurses consulted? If so, who?

A. I don’t know.

j) Why was handover signed off without HEPA filters?

A. I don't know.

101. Were HEPA filters missing from any other wards following handover?

A. I don't know.

a) Discuss how this was managed.

A. I don't know.

Chilled Beams & Thermal Wheels

102. Tell me about your understanding of the use of chilled beams in areas where immune compromised patients are treated:

A. I have no knowledge or understanding about the use of chilled beams.

103. Describe your understanding at the time of the cleaning regimes in place for chilled beams? If you were not involved, with the benefit of hindsight should you have been?

A. I was not involved and given my role at the time I would not expect to have been.

104. Can the witness recall any specific events in relation to chilled beams?

A. There were issues reported of water leaking onto floors and black spores visible on the surface.

For example:

a) Dripping chilled beams in critical care refer to **Estates Communications Bundle, document 63.**

A. Yes I was aware of this happening.

b) What did you understand about the situation, what was your involvement? Describe any action taken and by whom in response to the issue.

A. I can remember that my involvement would have been to make sure the domestic assistants were available to clean up any water on floors. There was also some black stuff leaking from the chilled beams, so I had to ensure that staff were on hand to deal with that also. I believe the black stuff may have been mould or similar.

c) Issues with dew point controls refer to **Estates Communications Bundle, document 65.**

A. I was not aware of issues with dew point controls.

d) Ward 2A cubicles 8-11 refer to **Estates Communications Bundle, document 106.**

A. I don't remember specific rooms/areas but there were issues in several areas.

e) Water samples being taken from chilled beams in Ward 6A refer to **IMT Bundle, document 73.**

A. I don't remember water samples being taken.

f) Leakage chilled beams Ward 6A refer to **Estates Communications Bundle, document 138.**

A. As above I remember several areas being affected but not specific ones.

g) Leakage chilled beams Ward 6A refer to **Estates Communications Bundle, document 139.**

A. As above.

h) Leakage chilled beams Ward 6A refer to **Estates Communications Bundle, document 142.**

A. As above.

i) Any other issues/ incidents not mentioned above.

A. None that I can remember.

For each event, please tell us:

a) What was the issue?

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved?

d) What was the escalation process?

e) Were any external organisations approached to support and advise?

f) If so, what was the advice?

g) Was there opposing advice and by whom, and what was the advice?

h) What remedial action was decided on and who made the decision?

i) Was the issue resolved – consider any ongoing aftercare/support/monitoring?

j) Any ongoing concerns witness had herself or others advised her of?

k) Was there any documentation referenced during or created after the event. For example, an incident report?

l) Did anyone sign off to say the work had been completed and issue resolved/area safe.

Write your answers above in the relevant section.

A. (No answers provided)

105. Tell me about your understanding of the use of thermal wheels in areas where immune compromised patients are treated:

A. I have no knowledge or understanding about thermal wheels.

106. Can the witness recall any specific events in relation to thermal wheels?

A. No.

a) What was the issue?

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved?

d) What was the escalation process?

e) Were any external organisations approached to support and advise?

f) If so, what was the advice?

g) Was there opposing advice and by whom, and what was the advice?

h) What remedial action was decided on and who made the decision?

i) Was the issue resolved – consider any ongoing aftercare/support/monitoring;

j) Any ongoing concerns witness had herself or others advised her of?

k) Was there any documentation referenced during or created after the event. For example, an incident report?

l) Did anyone sign off to say the work had been completed and issue resolved/area safe.

Combined Heating and Power Unit

107. Describe the Combined Heating and Power Unit (CHP)

A. I have no understanding or knowledge about CHP.

a) What is the purpose of the CHP?

A. I don't know.

b) What condition was the CHP in at handover?

A. I don't know.

c) What information do you have to support your view on the CHP's condition?

A. I don't know.

108. Was commissioning and validation of the CHP carried out prior to handover?

A. I don't know.

a) What commissioning and validation documentation did you see, if any?

A. None.

Refer to **Estates Communications Bundle, document 11 page 90**

b) Who was responsible for ensuring that the commissioning and validation documentation was in place?

A. Multiplex.

c) Where were records of the commissioning and validation for the CHP kept?

A. I assume it should have been Zutec.

109. Who was responsible for ensuring that the CHP was operating correctly?

A. Multiplex.

110. If the CHP was not operating correctly, could this impact patients? If so, how? Refer to **Estates Communications Bundle, document 12 page 101**

A. It could have impacted on the comfort and safety of patients, staff, and visitors.

a) What concerns, if any, did you raise about the CHP? If so, to whom, and what action was taken?

A. None.

b) Estates Communications Bundle, document 17:

a. What is meant by labs flushing?

A. I don't know.

b. What issues, if any, arose from this?

A. I don't know.

c. What is the importance of this?

A. I don't know.

d. Discuss your knowledge of the reference to a '40 year old system':

i) Explain what the 40 year system was:

A. I assume this was the heating system in the INS which was 40 years old, dating back to when the building was built.

ii) What was the issue(s)?

A. I don't know.

iii) What was the potential impact?

A. The system would breakdown.

iv) What actions, if any, were taken to address the issue(s)?

A. I don't know.

c) What was your understanding of how the CHP should be operated?

A. I didn't have an understanding on the operation of the CHP.

d) What were the cost considerations for the operation of the CHP? What considerations impacted on its operation?

A. I don't know.

e) How was the CHP system being operated by GGC?

A. I don't know.

f) What operational issues, if any, were encountered by GGC with the CHP? Refer to **Estates Communications Bundle document 12.**

A. I don't know.

g) Refer to **Estates Communications Bundle document 16:**

a) Have you seen this before?

A. No.

b) What is this document?

A. I don't know.

c) **Column 274 – 'all CHPs cut out'** – what does this mean? How would this have impacted patients?

A. Supply of heating and water to wards would have been compromised or interrupted.

d) Refer to **Estates Communications Bundle, document 36** what was the incident referred to? Were you involved? How was this matter resolved?

A. I don't know I wasn't involved.

h) Refer to **Estates Communications Bundle, documents 19 & 20:**

a. Provide any information about any concerns you had in relation to the building temperature and power.

A. I was aware there were reports of high temperatures in some areas and low in others.

b. What was your involvement?

A. None.

c. Was this recorded on Zutec?

A. I don't know.

d. What was the impact of these issues on patient migration?

A. I don't know if it was.

e. Were matters resolved? If so, how? If not, what was the consequence?

A. I assume so.

i) Refer to **Estates Communications Bundle, document 91, page 754:**

a. Look at column 78 – what does debris within the AHUs mean?

A. I don't know.

b. Is this something you would expect to see?

A. I am not qualified to answer.

c. What was the impact on the AHUs?

A. I don't know.

d. How was this matter resolved?

A. I don't know.

j) What happened in respect of Zurich?

A. I don't know.

k) Refer to **Estates Communications Bundle document 113:**

a) What is this?

A. Final defects list.

b) Why was it issued in 2017 and not earlier?

A. I assume because it was the end of the two-year defects phase.

c) What was the consequence of this?

A. I don't know.

d) On what basis did Multiplex carry out the work?

A. I don't know.

l) Refer to **Estates Communications Bundle, document 135:**

a) Please explain what this email was about.

A. I don't know.

b) Was the money released or not?

A. I don't know.

<u>Water Guidance and Obligations</u>

m) What guidance applies to water? How did you/others ensure that guidance was complied with? What contractual documents, if any, would you consult to ensure guidance was complied with?

A. SHTMs and HTMs are the guidance documents for all buildings I do not know which were current at time of handover as it was not my remit.

n) Who was responsible for ensuring a safe water supply following handover?

A. The appointed persons responsible as per the Board's Water safety Policy.

o) What water safety training was provided to all maintenance staff, estates officers and contractors?

A. Training was provided but I do not know the detail.

p) What was your knowledge and understanding of Health and Safety regulations on control of legionella at the time?

A. In 2015 none.

q) What legionella training was provided to all maintenance staff, estate officers and contractors?

A. I don't know.

r) What water borne pathogens (other than legionella) training was provided to all maintenance staff, estate officers and contractors?

A. I don't know.

s) Who was the Dutyholder?

A. I don't know.

t) Were you aware of obligations to appoint an authorised person or the like to discharge water supply safety? If so, who was appointed? When, for what period? If not, why not?

A. I was not aware at the time as it was not my area of responsibility.

u) Commissioning of water system prior to handover/ patient migration to QEUH:

a) Requirements

A. I don't know.

b) Who was responsible for this?

A. Estates Manager with the delegated responsibility.

c) What checks were carried out to ensure that the water system had been commissioned. Refer to **Estates Communications Bundle, document 132.**

A. I don't know.

d) Was SEPA/ the Water Board involved? Describe their role and involvement.

A. I don't know.

e) Which teams (such as infection control) were involved in the water system sign off, who would have signed it off on behalf of those teams?

A. I don't know.

f) Were L8 testing requirements complied with?

A. I don't know.

g) Were there any legionella concerns at handover? Is so, what was done to deal with these?

A. I don't know.

h) What concerns, if any, did you have about water sitting in the system before the hospital opened?

A. I didn't have any concerns as it was outwith my knowledge and experience.

i) Were you aware of any issues with the testing of the water system?

A. Not at handover.

j) What was your understanding at the time of the SHTM guidance, particularly SHTM 2027 and SHTM 04-01, in respect of water?

A. Nothing at the time.

k) How compliant was the QEUH/ RHC water system with SHTM 2027 and SHTM 04-01 at the date of handover – if not, what was outstanding? Who was responsible to ensure that the water system complied with SHTM guidance? What team was in place to regulate compliance? If so, please explain your knowledge, understanding and role within that team:

A. I have no knowledge or understanding of the compliance of the water system to the SHTMs at handover.

v) Was a pre-occupation water test done prior to occupation? Refer to **Estates Communications Bundle, documents 14, 14.1, 14.2:**

A. I don't know.

a) Who carried this out?

A. I don't know.

b) If this was not done, should it have been done and why?

A. If it was a requirement in adherence to the SHTMS then it should have been done.

c) Consequences of not doing it.

A. Risk of water quality being below acceptable standards.

d) What risks assessments were carried out pre-occupation in respect of the water system? If these were not done, should they have been? What were the consequences? What further action did you take?

A. I don't know, not my remit.

111. What was the post occupation water testing regime at QEUH?

a) Was carried this out?

A. I don't know.

b) Who carried out testing?

A. I don't know.

c) Your involvement with the testing?

A. None.

d) How frequent was testing?

A. I don't know.

e) Did this comply with L8 and SHTM 04-01 guidance? If not, why not?

A. I don't know.

f) What happened to the results?

A. I don't know.

g) Your role in connection with the results of water testing?

A. None.

h) Where were the results stored?

A. I don't know.

i) What action was taken in response to results?

A. I don't know.

j) Was there an escalation process? How was non-compliance managed?

A. I don't know.

k) We understand that there were positive legionella results in Ward 2A in around June 2015. Were you aware of this?

A. No.

l) What concerns did you have about the positive legionella results?

A. I didn't know.

m) What action did you take in response to this?

A. I was not involved.

n) Were you aware of legionella being found in any other areas of the hospital? If so, where, and what action was taken?

A. No.

o) In around June 2015 Dr Christine Peters requested the risk assessment for waterborne infection in the QEUH from Estates, the Project Team and Mary Anne Kane. Were you asked to provide this information? If so, did you provide it? If not, why not? why?

A. I did not hold this information and was not asked to provide I did not work in Estates at this time.

p) How many positive tests, if any, came from Ward 4B? Could you recall how many positive tests at the time?

A. I don't know.

Water - Commissioning and Validation (C&V)

112. What commissioning and validation documentation did you see before handover in 2015 – if not, who would have had sight of this?

A. I did not see any commissioning or validation documentation before handover. I would have thought the Operational Estates team at QEUH would have had sight of this if they were to take on the Maintenance of it.

113. Where is this commissioning and validation documentation ("C&V") stored generally on the hospital system?

A. I would have thought is would have been stored on Zutec.

114. What is the purpose of C&V?

A. To ensure all equipment and systems are operating properly and in accordance with the contract and all statutory and mandatory requirements.

115. What are the consequences of it not being carried out?

A. Risk of equipment and system failures impacting on the health and safety of patients staff and visitors.

116. How many records were kept of the cleaning and testing regime? Where were the records kept and what was the retention policy? What concerns, if any, did you have about record keeping and retention?

A. I was not involved in the cleaning and testing regime or the record keeping so I would not have had any concerns.

117. What concerns, if any, would you have If the water system were to have no C&V before handover in 2015? Why were you concerned?

A. I was not aware that the water system had no C&V at handover in 2015.

118. Describe the same in respect of verification and the cold-water supply system.

A. Same answer as above.

119. What C&V of the water system was carried out post-handover?

A. I don't know.

a) Who was responsible?

A. The Estates team.

b) How was the C&V recorded?

A. I don't know.

c) Any concerns arising from post-handover C&V? If so, why did these concerns arise?

A. I was not involved so had no concerns.

<u>Water System – General</u>

120. What testing and maintenance protocols and regimes were in place? What should have been in place. If it wasn't, why wasn't it? What did you do about that?

A. I was not aware of what was in place or what should have been.

121. What concerns, if any, did you have about the temperature and movement within the water system? How was this recorded and measured? Who was responsible for this? If Schnieder did these were these reports forwarded to yourself or other GGC employees? How were these reports responded to,

what did they tell you? How were issues flagged in these reports dealt with/ resolved?

A. As above I was not involved in this.

122. What concerns, if any, did you have about testing and stagnant water being in the system following testing? Please describe and provide information on how this was dealt with?

A. I was not involved in this.

123. What concerns, if any, did you have about dead ends/ legs in the system? Please describe and provide information on how this was dealt with.

A. I was not involved in this.

124. To what extent could the water system in QEUH/RHC have been more comprehensive?

A. I am not qualified to answer.

125. To what extent would have the water system have achieved the system objectives if operated correctly? In your answer set out what the system objectives were and how these were/ could have been met.

A. I don't know.

126. Describe any ward/area specific water systems used?

a) Detail the individual ward water specification?

b) What were/ are your thoughts about this?

c) Why, if applicable, did certain wards have different water systems?

d) Was there a standard protocol for sanitising water systems?

A. I don't know.

127. To what extent were the standard protocols for sanitising water systems used on a system of the size and complexity of this one?

A. I don't know.

128. Were consultants brought in to advise on sterilisation of the water systems?

a) If so, who were they?

b) Had you worked with them before?

c) Describe and comment on the methodology used.

d) Who decided to accept it or not.

e) Did it work?

f) What paperwork or records were kept in relation to their installation, maintenance, or flushing?

g) How were these kept on paper or electronically?

h) What equipment for recording work was used by employees doing day to day tasks?

i) How was that then reported back and checked?

A. I was not involved in any of this and am not qualified to answer

112. What is your understanding of the GGC protocol for dealing with water testing results? E.g. escalation process, reporting obligations etc.

A. There is an escalation process, it would depend on whoever requested the samples as it would be their responsibility for escalating. It would normally be estates so they would escalate to their management. Microbiology would also be made aware. There was a detailed process in place however I can't remember the details at this time.

<u>Water Maintenance</u>

Refer to Estates Communications Bundle, document 10.

113. Explain the cleaning and maintenance of the water system, taps, drains, shower heads etc. When doing so consider:

a) What is the cleaning regime?

A. The cleaning regime for water systems, taps and drains, shower heads were generally detailed in Standard Operating Practices (SOPS) for Estates and Domestic Staff.

b) What is the importance of this?

A. To ensure the provision of a safe water supply and prevent contamination.

c) What responsibilities did you have a result of this?

A. In January 2018 when I moved to the GM post at QEUH I assumed responsibility for the operational Estates and Facilities Teams which included ensuring all SOPs were adhered to. which included.

d) What did you do to ensure these responsibilities were executed?

A. Though the line management structure and team briefs. Any new or change to standard practices which arose from the IMTs were actioned as soon as possible. New guidance was issued around the cleaning of drains to domestic and estates staff and also guidance around cleaning the point of use filters on taps which we had no previous experience.

e) What issues, if any, did you have fulfilling these responsibilities?

A. we had to ensure new SOPs were developed with colleagues from Infection Control and that they were circulated to all domestic and Estates staff and provide appropriate training. New concerns were being raised regarding the drainpipe work and about its suitability. We had to react quickly to deal with issues as they arose.

f) Describe the concerns raised about the drain pipework. Who raised these concerns? What was the potential patient impact?

A. I think it was through one of the IMT groups -p possibly Theresa Inkster – she thought the design of the drains could potentially be causing splashback and possible contamination.

g) Who did you work with from Infection Control to develop the SOPs?

A. There were a number of us. Domestic Services Manager Pat Coyne and an infection control nurse for the children's hospital Susie Dodds: we worked with her to develop an sop in term of how to clean the drains. It was also from estates perspective, normally the drains wouldn't have been cleaned lower than the plug so we were working with Susie Dodds to do that.

h) What concerns if any were raised about cleaning practices? **IMT bundle, document 23.** Detail these concerns. Refer to **NHS GGC SBAR Bundle, page 112** when providing your answer.

A. Deep cleaning of drains had not been standard practice until these issues arose so having to find solutions and disseminate the information to all the relevant staff groups as quickly as possible was challenging and concerning.

i) Why had deep cleaning of the drains not been standard practice until these issues arose? Should it have been?

A. It was an industry norm. Drains at the point below the plug hole were not routinely cleaned, the thinking was that this would disturb any existing bacteria which could possibly be harmful.

j) What, if any, matters regarding the maintenance of the water system were escalated? If so, were they escalated BICC or AICC?

A. I can't remember exactly which groups the matters arising were reported to but the senior executives of the Borad were aware of the situation.

k) What is dosing?

A. Dosing was when a chemical was added to the water system to remove the bacteria.

l) Why was chlorine dioxide used in the cleaning regime. **IMT bundle, document 30.**

A. This chemical was approved for use via the IMT as it was suitable for use in this environment and would deliver the desired results.

m) What were the desired results? Did the use of chlorine dioxide achieve the desired results?

A. To reduce the organisms being found in the water supply to a safe level.

n) Clearing of drains in June 2018 following water incident -relevance and purpose. **IMT bundle document 27**. Did this resolve the issue? **IMT bundle, document 38** why was expert advice required?

A. Expert advice was sought as cleaning of drains in this manner was was not standard practice and whatever methodology was used needed to avoid contamination of the surrounding areas, there were discussions around where agitation e.g. using brushes etc was required, depending on which method was used would inform whether the bed room/ bed space needed to be empty and what leave of room cleaning was required afterwards.

o) From whom was expert advice sought?

A. There were a number of water specialist brought in – they would have been members of the water technical group or the IMTs but I can't remember who they were now.

p) What happened in response to concerns about on-going maintenance and cleaning? What further action did you take personally?

A. As with all actions from the IMT I worked with Estates and Facilities colleagues to implement whatever resources were required to complete. We sought external expert advice as this was an new issue. Domestic hours were increased to support the additional work and they worked closely with the clinical staff to minimise any impact on the availability of bed spaces.

q) What further steps could have been undertaken?

A. I think we did all we could in the circumstances.

114. To what extent were you involved in the decision to proceed with a drain survey? If so, can you explain your role in this decision? What was the purpose of the drain survey?

A. I supported the decision to proceed with a drain survey but I could not inform the decision as I was unqualified to do so. The drain survey was to try and establish why the contamination was occurring.

115. Why did you support the decision?

A. Because it was part of the IMT – they were experts and qualified people who said this was the correct action to take so I supported this decision.

116. What were the results of the drain survey?

A. I don't remember the details but there were issues found.

117. What was found in the water tanks; what if anything significant was found in the water tanks? To what extent would anything found result in a wider issue of water contamination?

A. I can only recall that there was contamination in the water tanks not what the nature of it was.

118. Concerns have been raised regarding the hospital design and the increased risk of water contamination; what is your view on the increased risk of water contamination in relation to the following:

a) Having a single barrier approach water system, resulting in fluctuating water temperatures

A. I am not qualified to answer this.

b) Ensuite bathrooms attached to each room.

A. Again, I am not an expert but if en-suite bathrooms were a known risk for water contamination they would not have been part of the design.

c) Overprovision of water outlets leading to sink removals

A. Every sink in place was there because it was requested during the design process usually due from an infection control perspective, so it was surprising they had to be removed for infection control purposes.

d) How involved were you in the decision to use point of use filters?

A. I supporter the decision through the IMT process although not qualified to comment on their efficacy.

e) Who was responsible for the effective management of and installation of the point of use filters?

A. An expert 3rd party company provided, installed and replaced the water filters. Estates staff managed the process and reported any issue e.g. if the filter was moved or damaged and arranged for replacement.

f) Did the point of use filters meet the water regulation requirements? Did they have an effective gap between the water level and the filter to prevent contamination?

A. I understood that the water regulation requirements were met.

g) Why were the point of use filters not introduced earlier?

A. I don't remember.

h) How often were you aware of the filters being changed? Were the manufacturer's recommendations followed?

A. I think the filters were initially to remain in place for 60 days as per the manufacturer's guidance before changing but this was reduced to 30 days.

i) How involved were you in decisions relating to water testing?

A. I attended the IMTs and also the Water Safety Group and supported the recommendations made by those experienced and qualified in their fields.

j) If not, who was responsible for these?

A. As above.

k) What do you understand about management of water testing? What do you understand about decisions on when water testing should be undertaken?

A. I knew only what I learned at the IMTs and the Water Safety Group.

119. In her statement Dr Teresa Inkster states *'there was a direction from Mary Anne Kane, who was at senior director level, not to give microbiologists access to water testing results'*:

a) What is your reaction to this statement?

A. I was not aware of this and I don't know on what basis Mary Anne would have given this direction.

b) Why did estates direct that microbiologists should not have access to water testing results?

A. I do not know.

c) Have you ever been advised not to contact someone/ not to provide water testing information? If so, when? By whom? and why?

A. No.

d) Have you ever refused, or directed others to refuse to provide water testing information requested by microbiologists or infection control? If so, why? Provide as much information for your rationale and the consequences of withholding information.

A. No.

e) Provide information on how you dealt with requests for water testing results from microbiologists and infection control - was all the information requested provided? If so, what was provided? If not, why was paperwork not provided?

A. I was never asked for water testing results.

f) What legal and regulation requirements must be complied with to carry out regular water testing?

A. I don’t know.

g) What situations would water testing not be carried out?

A. I don’t know.

h) What are the consequences of regular water testing being carried out?

A. Provide assurance or highlight any issues.

i) Dr Christine Peters tells us that in April 2016 water testing results or ARU2 were not available. To what extent is this accurate? If it is accurate, why were results not available, and should they have been?

A. I don’t know I was not involved with the water issues at this time.

j) Both Dr Penelope Redding and [redacted] tell us that they asked for information which was not forthcoming. To what extent do you agree with their recollection of events? If you agree, why was testing information not provided to clinical staff, microbiologists, and infection control?

A. (No answer provided)

k) Who was responsible for dealing with these requests for information?

A. I don't know who was responsible at that time.

l) What was your role in dealing with these requests for information?

A. At that time, I had no input into Estates matters.

m) How were these requests for information managed by your department? What steps did you take?

A. I don't know I was not involved.

n) What concerns, if any, did you have with how matters were being handled? If so, what steps did you take in response to these concerns?

A. I was not involved.

DMA Canyon Reports

120. Refer to Bundle 6 – Miscellaneous documents – documents 29 and 30.

a) Was this the DMA Canyon 2015 report **(document 29)**?

A. Yes.

b) Who ordered this?

A. I don't know.

c) Who signed off on payment?

A. I don't know.

d) How was this signed off or payment processed?

A. I don't know.

e) Who was the report sent to?

A. I don't know.

f) When did you first become aware of the DMA Cayon 2015 report?

A. I don't remember, it may have been 2018.

g) What was the purpose of the report?

A. To report on the water safety in the new buildings.

h) Who had the report?

A. I don't know.

i) The Inquiry's investigations indicate that the work and actions recommended in the DMA Canyon 2015 report were largely not actioned by the time of DMA Canyon 2018 report. Were you aware of this at the time? Do you have any views?

A. I didn't find out about the 2015 report at the time – it wasn't until the 2018 report came that I heard about it. I do think that the recommendations in the 2015 report should have been carried out but I don't know why this wasn't done at the time.

j) When Were DMA Canyon present at QEUH/RHC site between 2015 and 2018?

A. I don't know.

k) What, if anything, did DMA Canyon say about the report during their time on site between 2015 and 2018? If so, when and what was mentioned?

A. I don't know.

l) When were the works suggested in the 2015 report actioned?

A. I don't know.

m) What is your own view of the findings of the 2015 report? Do you agree with it or not? Explain your rationale.

A. I am not qualified to answer.

n) DMA Canyon prepared another report in 2017 **(Bundle 6 – Miscellaneous documents, document 30)**. What works, if any, recommended in the 2015 were carried out prior to the 2017 report?

A. I don't know.

o) What happened with DMA Canyon in 2017 – tell me as much detail as possible. Who dealt with matters, what was your role and when did you become involved? Who sanctioned the works in 2017 report?

A. I don't know as I was not based at the QEUH at this time.

p) What was the impact, if any, of the failure to implement the 2015 recommendations on patient safety?

A. I am not qualified to answer.

q) We understand that Infection Control were only advised about the 2015 DMA Canyon Report in 2018. Why were they not told sooner? What happened?

A. I don't know.

r) Whose responsibility was it to be satisfied that the risk assessment had been carried out? Explain how you were satisfied that the appropriate risk assessment had been carried out prior to patient migration to QEUH.

A. I do not know who was responsible and at migration I had no involvement with Estates matters.

s) Dr Christine Peters also states that she asked for *'asked for risk assessments for waterborne infection in the QEUH and they were not forthcoming from the Project Management Team, Estates, or Mary Anne Kane.'*
Do you recall being asked for this information? Did you provide the information requested? If so when and by what means? If not why not?

A. I was not asked for this information, and I did not have access to it.

February 2016 – Sinks – Ward 2A

121. In early 2016 a PAG took place regarding the *'Contamination of aseptic pharmacy unit at RHC water supply with Cupriavidus pauculus'* a subsequent investigation linked the infection to sink within the Aseptic Pharmacy Unit:

a) What was your understanding of this incident?

A. None.

b) What was your involvement with this matter?

A. None.

c) Do you recall anyone taking action, if so what, in relation to this incident?

A. I was not aware of this incident and was not based at QEUH at this time.

d) Do you recall any further issues in relation to sinks? If so please discuss, confirming your involvement and action taken in response to any issues.

A. No.

Water Incident 2018

122. Walk through the concerns as they emerged in 2017 into 2018 in respect of the water issues. Initially focus on your recollection of events as they happened. In relation to the concerns:

a) When did the concern arise?

b) Nature of concern?

c) Possible cause of concern?

d) Action taken in response to concern.

e) What actions were taken in response to concern?

f) How sufficient were these actions?

A. When I was moved to the QEUH in January 2018 concerns regarding the water issues had been raised. I became involved when the IMTs had been established. When any actions were raised, I worked with colleagues to complete them.

123. The following IMTs have been highlighted to assist with this. If you are also able to respond to the questions raised in respect of the IMTs below when considering your recollection of events.

a) Refer to **IMT bundle, document 13:**
Cupriavidus bacteraemia in ward 2A at the end of January 2018

(i) What do you recall of this incident/ issue?

A. Only the information contained in the IMT minutes.

(ii) When did it begin?

A. I don't know.

(iii) How did it come to light? Who first reported the incident?

A. I don't know.

(iv) What was your involvement?

A. When I joined the IMT around Jan 2018, I took up ensuring actions for Estates and Facilities were completed.

(v) What enquiries, if any, did you make about replacing all the taps within Ward 2A? What did you do? Did you discuss this with anyone else? What was the outcome?

A. I did not make any enquiries regarding replacing taps or discuss it with anyone else.

b) Refer to **IMT bundle, document 16:**
Multiple positive results Cupriavidus and now Stenotrophomonas, Dr Inkster states that the test results are from taps which have not been replaced in rooms 15 and 26. Shower head in room 12. At that IMT no cause for patient concern.

(i) What was done as result of this meeting and why?

A. Mobile hand washing units were to be installed to stop use of sinks until contamination was stopped.

c) Refer to **IMT bundle, document 17:**

(i) Your involvement and what measures were taken?

A. Attending IMT and working with colleagues to complete actions.

(ii) Did you discuss this with David Loudon?

A. No, David Loudon had left the Board by this time.

(iii) What do you recall about how matters were managed?

A. It was a very intense period and there was a lot of tension and activity. We were dealing with a situation where we were trying to find a cause and a solution at the time. I think everyone was trying their best but there were some tensions.

(iv) How were costs managed?

A. I think special funding was allocated.

(v) Who carried out the work?

A. Estates and 3rd party contractors.

(vi) How was this reported and managed?

A. Though the Water Safety Group.

(vii) How involved were you in the decision to use bottled water for handwashing and drinking? Discuss your knowledge and involvement surrounding this matter.

A. I was a member of the IMT which recommended this action and supported it but based on advice from those with knowledge and expertise.

d) Refer to **IMT bundle, document 18:**

(i) As above, what was the outcome of this IMT, your involvement, actions and how you followed it up.

A. As before I any actions assigned to me or Estates and Facilities were carried out.

(ii) What concerns, if any, did you have about Stenotrophomonas impacting patient safety at this point?

A. Everyone was concerned for patient safety at this point.

(iii) Refer to **Estates Communications Bundle, document 121;** how does this link to the IMT? Was this as a result of what was being discussed? What happened following this email?

A. I don't know.

e) Refer to **IMT bundle, document 19:**

(i) As above - the fitting of water filter – discuss – why were these filters not on the taps initially?

A. I don't know.

(ii) What knowledge do you have of dosing the system with silver nitrate? How did this discussion come about?

A. I have no knowledge about silver nitrate dosing.

f) Refer to **IMT bundle, document 20:**

(i) This was scored HAIIT red – why?

A. The risks in the areas assessed were deemed to be high risk.

(ii) What were the concerns?

A. The contamination did not appear to be eliminated and also the risk to patients' health.

(iii) To what extent do you recall any request for historical water results during the commissioning of QEUH/RHC? If so, what did you find out as a result? What concerns, if any, did the historical water results raise?

A. I don't remember requests for historical water results.

124. Refer to **Estates Communications Bundle, documents 125 and 133** what was the relevance of these document to the water incident?

A. I assume to ascertain if there was link between drain blockages and the contamination.

125. Describe any other issues or matters arising from the water incident:

A. I can't recall any.

<u>Taps</u>

126. The use of Horne Taps was discussed in the IMTs relative to the water incident. **IMT Bundle.**

Please confirm:

a) Your understanding of use of Horne taps?

A. These taps half flow straighteners to reduce the amount of splashing.

b) Who authorised the use of Horne taps?

A. There was a tap selection group during the design development process on the Project. I was not a member of this group, but I understand it contained clinical and infection control representatives.

c) Why were Horne taps selected?

A. I don't know the criteria used to select the Horne Tap as I was not involved.

d) How involved were you in the decision to use Horne Taps – **NSS SBAR Bundle, document 1 -** please discuss your involvement and understanding?

A. I was not involved.

e) What is your recollection of the use of Horne taps?

A. There seemed to be an issue with the flow straighteners being the source of bacterial growth.

f) At the time, were you aware of the incidents in Northern Ireland with Horne Taps?

A. No I wasn't.

g) If so, why did you decided to proceed with the installation of these throughout QEUH/RCH? What was the deciding factor?

A. I was not involved in the selection process.

h) Discuss **Estates Communications Bundle, document 121** explain the situation and your involvement?

A. I was not involved in the discussions regarding the Horne taps unless it was covered in a Water Safety Group meeting which I attended.

i) Refer **to Estates Communications Bundle, documents 127 and 128** explain the situation and your involvement?

A. As above I did not have the knowledge or expertise to contribute to the tap selection.

j) Flow straighteners – when did you become aware that they were non-compliant with SHTM 2027 and SHTM 04-01 guidance? Were they non-compliant at handover? **IMT Bundle, document 27.**

A. I don't know.

k) How involved were you with testing in high risk areas?

A. I wasn't involved.

l) What if any, new taps were replaced in January 2019? If so, why were they replaced? Was the replacement related to the use of chlorine dioxide? **IMT Bundle, documents 29 & 30.**

A. I don't remember.

<u>Water Technical Group</u>

Refer to Water Technical Group Bundle.

127. The water technical group (WTG) sat between 2018 and 2019. **Estates Communications Bundle, page 938:**

a) What is the purpose of WTG?

A. To address the water safety issues arising from the hospitals.

b) What issue/ event prompted the setting up of the WTG?

A. The water contamination issues in NHC.

c) What was your involvement with the WTG?

A. I was a member of the group while I was General Manager at QEUH.

d) Tell me about specific work which you carried out in respect of your involvement with WTG, why did you carry out this work, what was the impact? **Estates Communications Bundle, page 938 & 939**

A. I did not carry out any specific work in respect of my membership of this group as I did not have the knowledge or expertise to do so.

e) Was this within your remit within estates?

A. As above.

f) Who was in the WTG, what were their names and their roles within WTG?

A. There were water experts from various organisations as well as microbiologists and infection control. Senior Managers from Estates and Facilities were also members, I can't remember all who participated.

g) Why was the WTG set up?

A. To address the water safety issues rising from the hospital.

h) What qualifications were required in order to be chair of WTG?

A. I don't remember from the terms of reference for the group that there were any qualification requirements for the chair.

i) Discuss focus of WTG – what was the purpose – why was WTG required – what issues came to light as a result and what action was taken. What were the concerns of the WTG and how did this impact on patients? Refer to **Estates Communications Bundle, document 127, 128, 129 and 130** to assist and confirm how these relate to issues before WTG.

A. The focus of the group was to find solutions for the issues arising in the water system, including water dosing, drain cleaning and taps.

j) How did clinical staff and estates get along at these meetings?

A. To my recollection there was a lot of expert knowledge around the table, some disagreements on the correct solutions but generally speaking there was a willingness to solve the issues.

k) Refer to **IMT Bundle documents 39 onward, and any other IMTs as a result of WTG.** Go through and discuss issues – impact of patients – what was cause of these issues?

A. The WTG water experts had advised there was not a need for monthly water testing, however at the IMT meeting the representatives from HPS and HFS said they advised the water should be tested monthly. The group agreed that the water would be tested and that the results would inform the frequency going forward. Professor Gibson wanted assurance that all members of the WTG had the appropriate knowledge and expertise to give advice on these matters. I don't know if this assurance was given to Professor Gibson.

l) Refer to **Estates Communications Bundle, document 129,** why were NSS involved, guidance issued, actions taken?

A. My understanding was that NSS were the experts in terms of sourcing and procuring equipment suitable for NHS properties.

m) Refer to **Estates Communications Bundle, document 131**, explain the background, your involvement, the purpose, guidance issued, actions taken.

A. My involvement was limited to membership of the IMT and WTG I was not there as an expert but as an operational GM to coordinate and implement the recommendations made by each group.

Board Water Group

128. Refer to the **Water Safety Group Bundle:**

a) What is the purpose of the Water Safety Group (WSG)?

A. To provide assurance of water safety across all NHSGGC properties.

b) Why was the WSG set up?

A. To have an overarching group for water safety.

c) What was your involvement with the WSG?

A. I attended my first Board WSG in December 2018, prior to that I was a member of Sector or Site WSGs which reported into the Board's WSG.

a) Who was in the WSG, what were their names and their roles within WSG?

A. The names of members are noted in the minutes and would vary as roles and personnel changed. The Group was jointly chaired by Senior managers from Estates and Facilities and Senior Infection Control Mangers, there was representation from Health & Safety and all sectors within the Board, as well as microbiology and public health and the Board's authorising engineer for Water.

b) What qualifications were required in order to be in the WSG?

A. Membership was based on job role held and qualifications were based on job requirements.

c) Look through the **Water Safety Group Bundle** – explain any issues discussed, your involvement and any action taken by you, and why, in response to issues raised at the WSG meeting?

A. Issues regarding water testing, chilled water dispensers, ice machines were all discussed and actions taken, as the responsible persons for water safety sat with Estates the majority of actions were carried out by them and associated reports were submitted by them.

d) Was this within your remit within Estates?

A. My membership of the group was due to my role as General Manager for Estates and Facilities.

e) How did clinical staff and estates get along at these meetings?

A. My recollection is there was a good working relationship.

Review of Issues Relating to Hospital Water Systems' Risk Assessment 26th September 2018

Refer to Estates Communications Bundle, document 134.

129. Who commissioned/ordered the report? What issues prompted the instruction of this report?

A. I have not seen this report before and do not know who commissioned it or on what basis.

130. What concerns, if any, did you have about the water system?

A. My concerns were those raised in the IMT meetings.

131. When did these concerns arise? Was anyone else in estates concerned? Why?

A. When I moved to my post as GM at QEUH in Jan 2018.

132. What was the impact on patients?

A. Patient infections/harm and disruption to care.

133. What concerns, if any, did you raise with anyone?

A. As noted before the concerns were already raised before I became involved.

134. What happened in response to the report?

A. I don't know, I didn't see the report.

135. What matters if any, arising from this report did you escalate? If so, to who, and if not, why not?

A. I didn't escalate anything.

136. What works, if any, were carried out in response to any findings in this report?

A. I don't know.

Tap Water- Ward 3C – 2019.

137. What were the issues in relation to tap water?

A. I don't remember.

138. What was your understanding and involvement with these issues?

A. I don't remember being involved at all.

139. What action was taken?

A. I don't know.

140. How were matters resolved?

A. I don't know.

Other Water Incidents

141. What other specific events do you recall in relation to water? For example, do you have any recollection of debris in the water tanks? If so, please explain:

a) What the issue was.

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved.

d) What was escalation process.

e) Were any external organisations approached to support and advise.

f) Detail role and function of HPS and HFS, advise if they were involved and any reports prepared by them.

g) Detail advice given from external organisations; what was the advice, did you agree with it, how was any advice managed/ communicated with others in your team and your superiors.

h) Was there opposing advice and by whom.

i) What remedial action was decided on and who made the decision.

j) Was the issue resolved – consider any ongoing aftercare/support/monitoring.

k) Detail any ongoing concerns you had, or which you were made aware of.

l) Was there any documentation referenced during or created after the event? i.e. an SBAR/ minutes from a meeting – use the bundle provided to assist.

m) Did anyone sign off to say the work had been completed and issue resolved/area safe?

A. I was not involved in any other water incidents.

142. What were the NHS procedures for raising concerns about water or water infections?

a) How were these dealt with by you?

A. If anyone had approached me directly with concerns about water or water infections that were not already known I would have escalated to the Estates Manager responsible and given the sensitivity around water at the QEUH I would have alerted Mary Anne Kane and Infection Control. All Health and Safety concerns were formally reported via the DATIX system.

b) How was it confirmed they had been dealt with?

A. I would confirm my actions taken and ensure a DATIX was raised.

c) Do you recall specific ones and in particular any that gave you concern?

A. No.

143. What was your understanding at handover in January 2015 of water guidance and regulations specifically SHTM guidance (at the time being SHTM 27 and 40 and now being SHTM04-01) and L8 guidance?

a) What is the purpose of the guidance?

A. I was unaware of what the SHTM guidance was at handover.

b) What are the consequences of non-compliance with the guidance?

A. Compromise water safety.

c) To what extent was the water system in compliance with the guidance at handover?

A. I don't know.

d) How satisfied were you of the compliance?

A. I wasn't involved.

e) What documentation did you see that satisfied you? Where was that documentation stored? How often were you able to access the stored documentation?

A. I didn't see any documentation.

f) Was the water systems non-compliance discussed with any colleagues? What further action, if any, was taken to ensure that the water system complied with the guidance?

A. I was not involved.

Ventilation – Guidance and Obligations

144. What was your understanding at handover in January 2015 of water guidance and regulations specifically SHTM guidance?

a) What is the purpose of the guidance?

A. I didn't have any understanding other than compliance with the SHTM would provide safe water assurance.

b) What are the consequences of non-compliance with the guidance?

A. Water maybe unsafe.

c) To what extent was the ventilation system in compliance with the guidance at handover?

A. I don't know I was not involved as it was out with my remit.

d) How satisfied were you of the compliance?

A. I was not involved.

e) What documentation did you see that satisfied you? Where was that documentation stored? How often were you able to access the stored documentation?

A. I was not involved.

f) Was this matter escalated? If so, to whom? Was the ventilation systems non-compliance discussed with any colleagues? What further action, if any, was taken to ensure that the ventilation system complied with the guidance? Was there a team in place to regulate compliance, if so, please explain your knowledge, understanding and role within that team:

A. I was not involved.

g) Tell me about your role and involvement in the Specialist Ventilation Group? Explain the purpose of the Specialist Ventilation Group?

A. I had no involvement.

Ventilation - Commissioning and Validation

145. Describe the commissioning and validation process in respect of the ventilation system in the QEUH/RHC?

A. I don't know, I was not involved.

a) Who was this carried out by?

A. I don't know.

b) Who signed off?

A. I don't know.

146. To what extent, if any, did infection control have input prior to sign off? **Refer to Estates Communications Bundle, document 22**. For reference in this email Christine Peter's states that Craig (Williams) has not seen anything in writing about the ventilation.

A. I don't know.

a) If so, who did have input?

A. I don't know.

b) When should this have been done?

A. I don't know.

c) Were you involved?

A. No.

d) Were you aware of any concerns raised at any point about the ventilation system and its commissioning?

A. No.

e) What commissioning and validation documentation did you see before handover in 2015?

A. I don't remember seeing any.

f) If not, who would have seen commissioning and validation documentation?

A. I would suggest but I don't know: Board's Technical Advisors, Curry and Brown, Capita, Peter Moir, David Loudon, Ian Powrie.

g) What concerns, if any, would you have if the ventilation system was not commissioned? Likewise what concern, if any, would you have if they ventilation system was not validated?

A. I was not involved in the commissioning or validation of the ventilation system, and I do not have the knowledge or expertise to answer that.

147. Discuss the concerns about Ward 4B. Refer **Estate Communications Bundle, document 30 -** What was the purpose of the SBAR?
Refer to **Estates Communications Bundle, documents 30, 31, 32** to assist with your answer.

A. I was not involved in any discussions regarding Ward 4B.

148. How does commissioning differ to validation?

A. Commissioning is a process that ensures facilities, systems and equipment are designed and installed as specified and function as expected. A validation process confirms the parameters within which it works.

149. Was there a validation document to accompany this for handover?

A. I don't know.

150. What is the purpose of Commissioning and Validation (C&V)?

A. As per my answer at 147.

151. What are the consequences of it not being carried out? What concerns did you have, if any, that the QEUH/RHC had not been signed off without C&V?

A. The systems/equipment may not have been safe to operate. I was not involved in the C&V.

152. What concerns, if any, would you have if there were no C&V of the ventilation system?

A. That it wouldn't work correctly, and people were at risk.

153. Why would no C&V of the ventilation system give rise to these specific concerns?

A. Because there was no assurance for the contrary.

154. In her statement, Dr Teresa Inkster discusses concerns regarding Ward 4B:

a) What commissioning and validation data did you have in June and July 2015?

A. I did not have any.

b) Did you provide the commissioning and validation data to Dr Teresa Inkster?

A. No.

c) What testing and maintenance protocols and regimes were in place?

A. I don't know.

d) Refer to **Estates Communications Bundle, document 47, page 5/18 of document** - this states that air permeability tests were not carried out to 36 isolation rooms.

i) Were you aware of this? If you were not aware, who would have been aware?

A. I was not aware I don't know who would have been aware of this.

ii) What was the consequence of this?

A. I don't know.

iii) Why did handover take place in these circumstances?

A. I don't know.

iv) What happened following this report?

A. I don't know.

v) What concerns, if any, did the contents of the report give you? Why did the report give rise to these specific concerns?

A. I was not involved in this issue.

155. Have regard to the following emails when considering your answers to the above:

Estates Communications Bundle, documents 64, 67 and 68.

a) What concerns, if any, did you have about the ventilation system at the point of patient migration to QEUH?

A. As it was not part of my remit, I did not have any concerns.

b) Where was the documentation for C&V stored at that time?

A. I don't know.

c) Have you seen the ventilation system validation documentation as at handover (Jan 2015)?

A. No.

d) If yes – who carried this out, who signed off, who authorised?

A. (No answer provided)

e) If no – should you not have sought this? Who is responsible for ensuring it is in place? Who should have chased this up? Would this not be part of ID remit?

A. This was not my remit at the time.

f) Where would the paperwork have been stored/ Who would have been responsible for it?

A. I don't know.

g) If validation was not in place at handover, how did the hospital open? Who would have had the authority to allow the hospital to open without validation in place?

A. I don't know.

h) Were you asked by microbiologists or Infection Control to provide information regarding the ventilation system and validation? Refer to **Estates Communications Bundle, document 27.** Who was supposed to provide this information? If it was not provided, why not? What action was taken to ensure that information was provided – if it was not, what was done to escalate this? Who was responsible for providing this information?

A. I was not involved in this issue.

Ventilation system – General

156. What testing and maintenance protocols and regimes were in place? Refer to **Estates Communications Bundle, document 62.**

A. I don't know.

157. What concerns, if any, do you have relating to the ventilation? What concerns, if any, do you have relating to the water temperature? What concerns, if any, do you have relating to the movement within the water system? Refer to **Estates Communications Bundle, document 123.**

A. I wasn't involved in this issue, I was not qualified to comment.

158. Was it possible to incorporate a comprehensive ventilation system into the QEUH/RHC?

A. I am not qualified to answer.

159. Describe any ward/area specific ventilation systems used?

A. I am not qualified to answer.

160. What are your thoughts about these ventilation systems that were used?

A. I am not qualified to answer.

161. Refer to **Estates Communications Bundle, document 48.** Explain your concerns and actions taken?

A. I was not involved in this matter.

162. Refer to **Estates Communications Bundle, document 136.** Explain the concerns regarding latent defects and actions taken?

A. I was not involved in this matter.

163. Explain your involvement with a review of specialised ventilation areas?

A. I was not involved I am not qualified.

164. Dr Teresa Inkster tells us that there was little progress with this matter. To what extent, if any, is this statement accurate?

A. I couldn't comment.

Specific Events in Relation to Ventilation System

165. Can you recall any specific events in relation to ventilation?
For example:

a) In 2015 prior to patient migration there were checks to the ventilation in Ward 2A in particular, with there being issues in relation to breaches around the trunking, ceiling lights etc with the extract grills not being compliant with SHPN.

A. I have no recollection of this issue.

b) Lack of HEPA filters and general concerns ward 2A/B refer to **Estates Communications Bundle, documents 35 and 37**. Detail how the issues managed, what was your responsibility, outcome? Highlight any concerns you had with regards to work/ testing being carried out?

A. I was not involved in anything related to this issue.

c) Dr Brenda Gibson raises their concerns refer to **Estates Communications Bundle, documents 17 & 18.**
Describe your involvement and any actions taken in respect of this matter?

A. I was not involved in this issue.

d) Air permeability tests not carried out? Refer to **Estates Communications Bundle, document 47 Capita NEC3 Supervisor's Report (No 53) - dated September 2015.**

A. I was not involved in this issue.

e) Issues with rooms 18 & 19 Ward 2A? **Estates Communications Bundle, documents 46, 67 and 68.**

A. I was not involved with this issue.

f) Dr Christine Peters raised issues with the air change rates in Ward 2A?

A. I was not involved in this issue.

g) In December 2015 Ian Powrie emailed David Wilson, Brookfield Multiplex stating that the *'pressure in the isolation rooms presenting an unacceptable risk to the vulnerable patients present within these protective environments.'*

h) Were you aware of these concerns?

A. No.

i) If so, detail the issues?

A. I don't know.

j) Potential patient impact?

A. I don't know.

k) What was done to resolve matters and your involvement?

A. I was not involved.

166. In February 2016 Ian Powrie prepared a report regarding the action plan for proposed increase of extract in the ensuite rooms in the Schiehallion ward. Refer to **Estates Communications Bundle, document 93:**

a) Explain your knowledge of the issues?

A. None.

b) Detail the issues?

A. I don't know.

c) Potential patient impact?

A. I don't know.

d) What was done to resolve matters and the extent of your involvement?

A. I wasn't involved.

e) Issues in respect of the safety of the PPVL rooms and adequacy for isolating infectious or immunosuppressed patients?

A. I wasn't involved.

f) Issues detailed in **Estates Communications Bundle documents 94, 95 and 96?**

A. I wasn't involved.

g) Issues detailed in **Estates Communications Bundle, document 104?**

A. I wasn't involved in this matter.

h) Fungal growths in a number of rooms in ward 2A?

A. I was not involved in this matter.

i) Dr Inkster tells us that she wrote an SBAR regarding Ward 4C and recommended a feasibility study for the ward to improve the specification. This was discussed at the Specialist Ventilation Group in July 2019. What was your involvement, understanding of the issues and what action did you take?

A. I wasn't involved.

j) Any other issues/ incidents not mentioned above?

A. None that I was involved in.

In providing your answers, please tell us:

a) What was the issue?

b) The impact on the hospital (include wards/areas) and its patients (if applicable)?

c) Who was involved?

d) What was the escalation process?

e) Were any external organisations approached to support and advise?

f) What was the advice?

g) Was there opposing advice and by whom?

h) What remedial action was decided on and who made the decision?

i) Was the issue resolved – consider any ongoing aftercare/support/monitoring?

j) Any ongoing concerns witness had herself or others advised her of?

k) Was there any documentation referenced during or created after the event. For example, an incident report?

l) Did anyone sign off to say the work had been completed and issue resolved/area safe?

167. What level of awareness should a General Manager of Estates have of the ventilation issues?

A. They should be aware and seek expert knowledge and guidance to resolve.

<u>Isolation Rooms</u>

167. In the Stage 3 Sectional Completion Certificate **Estates Communications Bundle, document 3** on 29 January 2015, HEPA filters in isolation rooms were listed as incomplete **Estates Communications Bundle, document 3, page 25:**

a) What was missing?

A. I don’t know.

b) Why was the completion certificate signed when there were incomplete works to the isolation rooms?

A. I don't know.

c) Was this discussed with other members of staff? If so, who?

A. I don't know.

d) Was this issue escalated to Board level? If so, to whom and who escalated matters?

A. I don't know.

e) Explain what works were carried out to resolve this matter, your involvement and when matters were resolved?

A. I was not involved.

168. What was the issued referred to in the email at **Estates Communications Bundle, document 34**? How did this happen?

A. I don't know.

169. Discuss the air permeability testing carried out in respect of the isolation rooms **Estates Communications Bundle, documents 37 & 41:**

a) Why was this work carried out?

A. I don't know, I wasn't involved.

b) What was the result of this work?

A. I don't know.

c) What was your involvement in the work?

A. None.

d) What if any issues arose?

A. I don't know.

Refer to **Estates Communications Bundle, document 47 Capita NEC3 Supervisor's Report (No 53) - dated September 2015. Estates Communications Bundle, documents 51 & 55.1.** to assist with your answer.

i) Were patients in these isolation rooms at this time?

A. I don't know, I was not involved in this matter.

ii) Potential impact on patients?

A. I don't know.

iii) Your involvement with the HAI Scribe?

A. I was not involved with the HAI Scribe.

170. There were issues in August 2015 with isolation rooms refer to **Estates Communications Bundle, documents 44 & 45:**

a) Detail your understanding of the issues?

A. I don't know what the issues were as I was not involved.

b) Were the affected wards/ areas complaint with the relevant guidance at the time?

A. I don't know.

c) Your understanding of whether the affected areas/ wards had been built to contractual specification at the time?

A. I don't know, it was not something I was involved with.

d) Your involvement in carrying out/ instructing work to remedy any issues?

A. None.

e) Whether there were patients in the affected wards/ areas at the time?

A. I don't know.

f) Your understanding of the potential impact on patients?

A. I don't know.

171. There remained issues regarding testing in September 2015 refer **Estates Communications Bundle, document 61:**

a) Explain the issues?

A. I cannot comment, I wasn't involved.

b) Your involvement?

A. None.

c) Work carried out to resolve any issues.

A. I don't know.

d) Potential patient impact?

A. I don't know.

172. Refer to **Estates Communications Bundle, document 70**, David Loudon stated that the Board would not be taking handover until they were confident that the rooms were fully compliant:

a) At the time how were the rooms not fully compliant?

A. I don't know I wasn't involved.

b) Explain your involvement?

A. None.

c) What work was carried out and how was this recorded?

A. I don't know.

d) When did the rooms become fully compliant?

A. I don't know.

e) When did the Board accept handover of the rooms?

A. I don't know.

f) Who advised the Board to accept handover of the rooms?

A. I don't know.

g) What document did you see to confirm that the rooms were fully complaint?

A. I wasn't involved so I didn't see anything.

173. Discuss the issue with the manual controller in isolation rooms in ward 2A **Estates Communications Bundle, document 83:**

a) Your understanding and involvement?

A. I wasn't involved.

b) Work carried out?

A. I don't know, as I wasn't involved.

c) Potential patient impact?

A. I don't know, as I wasn't involved.

<u>Pentamidine Rooms</u>

174. Discuss Pentamidine Rooms:

a) What are Pentamidine Rooms?

A. I don't know.

b) Your understanding of the purpose of these rooms?

A. I don't know.

c) The guidance applicable to these rooms for water and ventilation?

A. I don't know.

d) Discuss any issues with the specification of these rooms during 2015 **Estates Communications Bundle, document 38.**

In particular consider any issues with:-

i) the air change rates

ii) air pressure **Estates Communications Bundle, document 78.**

iii) compliance with guidance

iv) any issue(s) arising from the testing

A. I wasn't involved in matters relating to this.

Ward 4B

175. What was the intended purpose of Ward 4B?

A. I can't remember.

176. Did this change prior to January 2015? If so, what changes were made?

A. I don't remember.

177. What, if any, changes were required to the ventilation system? Why were they made?

A. I don't know.

178. How involved were you with the changes?

A. I wasn't involved.

179. There were issues with Ward 4B though almost straight away with an SBAR being prepared on around 7th June 2015:

a) Discuss the concerns about Ward 4B. Refer **Estate Communications Bundle, document 30 -** What was the purpose of the SBAR?

A. I don't know.

b) How long after migration to ward 4B were patients decanted back to the Beatson?

A. I don't remember.

c) To what extent were issues raised in the SBAR from June 2015 present at the point of NHS GGC taking occupation in January 2015, and when Ward 4B was handed over to NHSGCC?

A. I don't know.

180. How could these issues arise immediately between handover and patient migration when the Ward was signed off and handover accepted?

A. I don't know.

181. Refer to Estates Communications Bundle, document 36:

a) What were the early testing being carried out?

A. I don't know, I was not involved.

b) Why were tests being carried out?

A. I don't know.

c) Explain your involvement.

A. None.

d) To what extent, did the test result provide assurance regarding Ward 4B's suitability for the intended patient cohort? If so, how?

A. I don't know.

182. Refer to Estates Communications Bundle document 23:

a) Was there issue(s) with the particle counts?

A. I don't know I wasn't involved in this issue.

b) If so, when was the issue(s) identified?

A. I don't know.

c) What was your role?

A. None.

d) What action was taken and by whom?

A. I don't know.

e) Did the action taken resolve the issue(s)?

A. I don't know.

183. Refer to Estates Communications Bundle document 39:

a) What were the issue(s) with the pressure gauges?

A. I don't know.

b) When was the issue(s) identified?

A. I don't know.

c) What was your role?

A. None.

d) What action was taken and by who?

A. I don't know.

e) Did the action taken resolve the issue(s)?

A. I don't know.

f) Why was the issue(s) not identified sooner than July 2015?

A. I don't know.

184. Refer to Estates Communications Bundle document 40:

Tell me about the upgrade works referred to, what the works were, why they were required, when the matter was identified and by who, what was your involvement. Were matters escalated, if so, by who and who was the situation escalated to?

A. I wasn't involved with this matter and had no involvement.

185. Refer to **Estates Communications Bundle document 62:**

a) What is this document?

A. A ventilation report.

b) Have you seen it before? If so, when?

A. I have not seen this before.

c) What was the purpose of carrying out a ventilation report in October 2015?

A. I don't know.

d) Did any issues arise from this report?

A. I don't know.

e) How involved were you?

A. I wasn't involved.

f) What matters, if any, did you escalate arising from this report? If so, to whom and why?

A. I did not escalate anything I was not involved.

g) If yes to (f) what action was taken?

A. Type your answer here.

186. Refer to Estates Communications Bundle document 66:

a) Discuss the issues referred to in this email chain.

A. I am not qualified to comment and was not involved in the issue.

b) What was your involvement?

A. None.

c) What works were required?

A. I don't know.

d) Why were works required?

A. I don't know.

e) Were all necessary works carried out?

A. I don't know.

187. Refer to Estates Communications Bundle document 69:

a) What is his document?

A. A report on air permeability testing.

b) Have you seen it before?

A. No.

c) How did this document inform your decisions and actions taken?

A. I didn't make any decisions or take in any actions as I was not involved in this matter.

188. Refer to Estates Communications Bundle document 71:

In this email Peter Moir states that Ward 4B was ready for handover:

a) How confident were you that the ward was ready for handover?

A. I was not involved in this work.

b) To what extent did the ward meet the relevant SHFN and SHTM 03-01 guidelines for the intended patient cohort?

A. I don't know.

c) What reservations, if any, did you have at that time?

A. As I was not involved, I did not have any reservations.

d) If so, when did you escalate these concerns and to whom? If not, why not?

A. No concerns.

e) Was any further work carried out to Ward 4B at this time?

A. I don't know.

189. Refer to Estates Communications Bundle document 73 detail the remaining defects at this stage, did this prevent handover of Ward 4B?

A. (No answer provided)

190. Refer to Estates Communications Bundle documents 77 & 77.1:

a) Discuss this email?

A. I haven't seen this email exchange before and as I wasn't involved in the changes to Ward 4B, so I can't comment.

b) Explain your involvement?

A. I had no involvement.

c) Explain any assurances given?

A. I can't comment as I wasn't involved.

191. In her statement Dr Teresa Inkster tells us that at a meeting on 7th December 2015 in respect of the proposed patient move back to Ward 4B that *'Ian Powrie highlighted that it was still unclear what specifications the original design team worked to.'*

To what extent is this statement accurate? What concerns did you have at the time regarding Ward 4B? What concerns did you have at the time about the ward specification? If so, explain what your concerns were and why? Had any of your concerns been resolved by December 2015?

A. I was not involved in this issue and had no input.

192. Refer to Estates Communications Bundle, document 87 – Why was NSS involved in the issues? Actions taken in response, your involvement.

A. I don't know.

193. Refer to Estates **Communications Bundle, documents 88 and 89**

a) Describe the situation?

A. I don't know and am not qualified to answer.

b) Any action taken?

A. I don't know.

c) Your involvement?

A. None.

d) Any concerns and whether matters were escalated and if so to who?

A. I was not involved and I don't know if matters were escalated.

194. Refer to **Estates Communications Bundle, document 101.**

a) Describe the situation?

A. I was not involved in this issue.

b) Any action taken?

A. I don't know.

c) Your involvement?

A. None.

d) In respect of Ward 4B describe the works carried out, why, your involvement and when. Use the below to assist and detail issues you were aware of in respect of Ward 4B, your involvement and any remedial works – works done and why?

A. I had no involvement in this issue.

Refer to the following when answering, if relevant to your involvement:

1. **Estates Communications Bundle, document 71**
2. **Estates Communications Bundle, document 72**
3. **Estates Communications Bundle, document 97**
4. **Estates Communications Bundle, document 115 -** why was there 'pre-start' meeting – what was the issue with this?

A. (No answer provided)

e) Involvement and knowledge to HAISCRIBE – what was this and what was the issue? Refer to **Estates Communications Bundle, documents 117 and 118**.

A. I don't know.

f) Refer to **Estates Communications Bundle, documents 120 & 122**

i) Describe the situation?

ii) Any action taken?

iii) Your involvement?

A. I was not involved in this issue.

g) Ward 4B:

i) When were Ward 4B patients decanted from Ward 4B back to the Beatson?

A. I don't remember.

ii) Why did this happen?

A. My understanding was to allow changes to be made to the ward.

iii) When patients initially transferred from the Beatson to Ward 4B was the specification of Ward 4B the same spec as the Beatson?

A. I don't know.

iv) If not, then why were patients transferred from the Beatson initially if the specification?

A. I don't know.

v) What works were carried out to Ward 4B during this time? Why, Was it an issue when the ward initially started taking patients? who signed off on the works? how did it become known that the works were required.

A. I don't know any of that detail.

Decision to Close Wards 2A/B and Move to 6A and 4B

195. Discuss the issues surrounding and leading up to the decant of patients from Ward 2A in 2018.

a) What was the lead up and background to this refer to **Estates Communications Bundle, document 133?**

A. My recollection of why the decision to decant patients from Ward 2A was a culmination of the water, drain and ventilation issues and the continuing cases of contamination. A decant would allow the required building works to be carried out.

b) What was your involvement?

A. As a member of the IMT and GM for Estates and Facilities I worked with clinical and non-clinical colleagues to facilitate the transfer.

c) What risk assessment and additional measures were put in place to ensure patient safety?

A. I am afraid I can't remember the detail of any risk assessments or any additional measures.

d) Who would have signed off on the move?

A. There is no single person who makes these decisions. The IMT would have recommended the move and it then would have gone to the executive: Jane Grant, Kevin Hill, etc. who would have acted the recommendation from the IMT.

e) Do you recall a risk assessment(s) being carried out? Who would have been responsible for carrying out the risk assessment(s)?

A. I remember one being carried out, but I don't remember who would have been responsible for the risk assessment. I think it would have been within the clinical specialty: senior management microbiology and infection control would all have been involved. I don't believe that estates and facilities would have been involved in the risk assessment aspect.

f) What concerns, if any, did you have about where the patient cohort was being moved to? If so, why did you have these concerns?

A. I did not have any concerns as colleagues who had a greater understanding of clinical and environmental needs had approved the move and I supported them. Perhaps my only concern was that it was an adult ward they were moving to and it did not have some of the rooms which ward 2A did i.e. playroom, parent room.

196. Discuss and detail the works done to Ward 2A/B what was required to be done and why, what had been done and when the work was completed? Please include details of your involvement. **Reference IMT Bundle to assist.**

A. I don't know the detail of the work to be carried out as I was not involved. The work was still ongoing when I left the QEUH campus in 2019.

197. Any other relevant information, for example mould behind the IPS panels in Ward 2A, the plasterboard used in the en-suites in 2A/B?

A. I remember this being found and the whole ward needing surveyed there was concern that would require further work and extend the decant period.

198. Discuss the issues surrounding the ward 2A patients when in occupation of ward 6A. In particular, views you may have in respect of:

a) Chilled beams?

A. There were reports of water dripping onto patient beds.

b) Gram Negative Bacteraemia?

A. I don't remember any detail regarding this, I was not a member of the IMT, and at this time I had either moved or was about to move post to GRI.

c) Water filters?

A. As above, I was not closely involved in the Ward 6A issues.

d) Ventilation, including HEPA filters?

A. As above.

e) Issues/ testing/ escalation/ response/ IMTs/SBARs impact on patients?

A. As above.

f) Patient communication?

A. No involvement.

g) Internal escalation - HAIIT scoring?

A. No involvement.

h) External escalation?

A. No involvement.

i) SBAR relating to Ward 6A **Estates Communications Bundle document 141?**

A. No involvement.

Reports prepared by Innovated Design Solutions October 2018

199. Refer to Bundle 6 – Miscellaneous Documents – Documents 33 and 34.

These documents are feasibility studies regarding increasing ventilation air change rates within Wards 2A and 2B by Innovated Design Solutions.

a) Who commissioned these reports?

A. I don't know, I was not involved.

b) What was the background to these reports being commissioned?

A. I assume it was in order to make the required changes to the ventilation in Wards 2A and 2B to allow the patients to move back.

c) Why were these reports commissioned? What issues prompted the instruction of these reports?

A. There were concerns regarding the suitability of the ventilation for the patient cohort.

d) What concerns, if any, did you have regarding the ventilation system in Ward 2A?

A. I was not qualified to know what the technical concerns were, but I was concerned that it meant it wasn't suitable for the patients.

e) What aspects of Ward 2A lead you to be concerned that it wasn't suitable for patients?

A. Because others who were experts said so, infection control, ventilation specialists and microbiology.

f) When did these concerns arise? Was anyone else in estates concerned? Why?

A. I don't know when the first concerns were raised and who with.

g) What was the impact on patients?

A. the ward had to decanted from the Children's Hospital to a ward in the adult hospital.

h) What concerns were raised with anyone?

A. there were concerns that the ventilation system was not suitable for the very high-risk patients.

i) Can you provide more detail about what these concerns? With whom were these concerns raised?

A. No, I was not aware of the specifics.

j) What concerns, if any, did you have regarding the ventilation system in Ward 2B?

A. I did not have any technical concerns as I wasn't qualified, but I was concerned that clinical colleagues, infection control and microbiology had concerns.

k) What concerns of Clinical colleagues, infection control and microbiology were you aware of?

A. Just that the concerns were not suitable for the patient cohort that was on the ward.

l) Why were you concerned that they were concerned?

A. Because they were experts in their field.

m) When did these concerns arise? Was anyone else in estates concerned? Why?

A. I can't recall when concerns were first raised and other colleagues in Estates and Facilities were concerned as there was questions around the specification of the ventilation system.

n) What was the impact on patients?

A. Patients had to be decanted to another ward.

o) What concerns were raised with anyone?

A. I don't know.

p) What happened in response to these reports? For example, the SBAR you prepared.

A. I don't know of the reports referred to and I did not prepare an SBAR.

q) What matters were escalated arising from these reports? If so, to whom, and if not, why not?

A. I do not know what this refers to.

r) What works, if any, were carried out in response to any findings in these reports?

A. I do not know.

s) Following the works being carried out, what was the ward specification? To what extent did it meet the requirements of SHTM 03-01 guidance?

A. I don't know and am not qualified to answer.

t) What was your understanding of SHTM compliance of the Ward following works being carried out?

A. I was not involved in the proposed work so I wouldn't know the compliance with SHTM.

200. When did you instruct Innovated Design Solutions before these reports if at all? If so, in what capacity? Describe any further action taken in response to any recommendations by Innovated Design Solutions.

A. I did not instruct Innovated Design Solutions in anything.

Cryptococcus

Refer to the Cryptococcus Bundle and NHS SBAR bundle 4, document 35 to assist.

201. Recall your understanding of the Cryptococcus infections in 2018:

a) What is Cryptococcus?

A. It is a fungus that causes an infection particularly in immune-suppressed patients.

b) What was your experience of Cryptococcus in a healthcare setting prior to QEUH?

A. I had no experience.

c) What were the issues with Cryptococcus at QEUH? When did you first become aware of these issues? What happened in response to these issues? Who, if anyone, did you report these issues to?

A. I first became aware in January 2019 on return from leave. Mary Anne Kane informed me that there were concerns regarding infections and that they were inspecting all the plant rooms for signs of pest infestation.

202. What issues, if any, were you aware of in respect of pigeons prior to January 2019? Please describe any issues and confirm how these issues were dealt with and your involvement, if any?

A. The Southern General site had always had a well-known pigeon issue – contractors changed occasionally depending on who won the contract. When the new hospital was built, we did have issues with pigeons, especially around the helipad. Because of this we had regular monthly cleans of the helipad and we also did pigeon proofing where we installed spikes and nets to stop them nesting – this was done by the specialist contractors, mostly by GP

environmental. We also had problems with them in the open spaces – many of these weren't accessible to the public but were designed into the building to let the light in. There were other areas such as walkways such as between the institute of neurological sciences and the hospital where there was a particular problem. We also put up nets there to stop them from roosting. We were restricted in some ways in the actions we could take in terms of controlling the pigeons due to animal welfare concerns. For example, we were not allowed to shoot them for control purposes for reasons of public perception. Most of the methodology we used was pigeon proofing, which did have its limitations.

I was always involved with pest control on the site, the regular inspections for pests were reported to me and therefore I was involved in a number of pest control methos=ds including monitoring and controlling insects and any likely hazards for example in the kitchens. Latterly I would not be involved directly in the minor pest control, however I was involved personally in dealing with the pigeon issues surrounding the helipad.

In terms of the helipad, because the helipad was right at the top of the building the pest control company did employ methods such as shooting the pigeons as we deemed this proportionate to the potential risk of helicopters arriving with patients.

203. Describe your visit to the plant rooms? When did you go, why did you go at that time, what did you see? Did cleaning take place before the visit – if so why – what was evidence prior to the cleaning?

A. I joined the planned plant inspection visit with Mary Anne Kane and I think Colin Purdon and Theresa Inkster were also there. We found evidence of pigeon infestation and pigeon guano. This was my first visit to the plant room since the concerns were raised. There may have been some cleaning carried out before the visit but as it was my first day back after two weeks of annual leave I couldn't confirm.

204. Tell us more about your comments that 'some cleaning may have been carried out before the visit'? What lead you to think this? Did that surprise you?

A. My understanding was that on hearing that the IMT had suggested that there was a link between pigeon infestation, Mary Anne Kane instructed Ian Purdon to carry out deep cleaning to be carried out on the affected areas. It was an appropriate reaction carried out in relation to the concerns – using a specialist professional company.

205. Describe your involvement, if any, with cleaning of the plant rooms at any time but in particular early 2019, including instructing cleaning to be carried out, to whom, why and when?

A. When it comes to the plant rooms, prior to 2019 I wasn't aware of a pest issue in the plant rooms – access to those was restricted so it should only have been estates and contractors who had access in them. If there had been any issues prior it would have been reported directly by estates staff through the helpdesk – the helpdesk would then contact the pest control company directly who would then come out and deal with them, so I would not have been directly involved if this had been the case.

Alternatively, if it was Estates staff then through their own estates managers they would be able to contact companies such as GP Environmental directly to get them to come out and deal with it.

Early in 2019 it all escalated because the IMT identified pigeons in the plant rooms as being a potential issue. I had been on leave over Xmas and new year. I think I may have returned on 8 January and that's when I had the first meetings about the plant rooms.

GP Environmental had already been out before I returned from annual leave – on my return I picked up the work. Alan Brydon from GP environmental was the ops director and I spoke to him directly. They were very quick and efficient in getting reports out so if I remember correctly that report came back to me the same day. They were very responsive, so they had already been in to

start the work in the plant rooms– after that they were in on a regular basis to carry out the work which was described in the report.

206. If cleaning was carried out, why was it carried out?

A. A programme of cleaning was carried out because pigeon guano was found in the plant rooms, and a programme of cleaning was then planned and carried out in order to remove it.

207. Refer to document from GP Environmental Ltd dated 8th January 2019: What concerns, if any, did you have on reading that there was *'a very large population of feral pigeons present at various locations…*'

A. I was always aware there was a feral population on the campus, but I was I was very concerned about there being a very large population as described in the report. My reaction to that would be to get the problem dealt with as soon as possible.

208. What concerns, if any, at the time did you have about the *'Significant Health and Safety Issue'* - what further action was taken, was this escalated? If so to whom? Were HPS/ HFS involved? If not, why not? What concerns, if any, in this regard do you have now?

A. As soon as possible we instructed GP Env to go ahead with their proposed works as soon as possible. In terms of escalation, I did not escalate it to HFS/HPS – I reported back either personally or through Colin Purdon to the IMT to keep them updated and reassure them that we were taking appropriate steps to deal with the problem. Any escalation to HFS/HPS would have been done through the route of the IMT, as they were the group who had direct contact with them. Also, there were members of HPS who sat in the IMT. Possibly In hindsight we could have had regular inspections of the plant rooms and other inaccessible areas carried out by pest control companies which may have prevented the problem arising to such a level. There are a substantial number of plant rooms throughout the hospital, about thirty I believe.

209. What action, if any, was taken follow receipt of this document from GP Environmental Ltd?

A. GP Environmental were instructed to carry out all the work they recommended and to begin work straight away.

210. What methods of cleaning were used by GP Environmental Ltd and why? Did this resolve the issue(s)?

A. GP Environmental would have used industry approved chemicals for cleaning the areas required as well as the cleaning they would have installed pest proofing measures such as plugging gaps and vents where possible and also installing spikes. As far as the plant rooms were concerned this resolved the majority of the issues. In terms of any other issues that arose, Estates were instructed to report it directly to pest control so that it was dealt with immediately. In some of the open spaces GP Environmental also caught and caged a large number of pigeons and removed them from the site. This proved to be an effective measure for reducing to population due to this interrupting their breeding cycle.

For months afterwards GP Environmental were a daily presence on site, and they monitored the pigeons on a daily basis taking action where necessary. After the work recommended in the report was initiated, I met with Alan Brydon daily to discuss any issues and progress. If any issues arose, he would make the necessary recommendations and I would approve them.

211. Were GP Environmental Ltd instructed previously in respect of pigeons at QEUH/RHC, if so when, and by whom?

A. Yes, GP Environmental were our main contractors for pest control including kitchen safety/insects, any reports of ants etc. As soon as any insect hazards were reported GP Environmental would be called, and they would deal with the issues as appropriate spraying with insecticide as required.

212. Do you recall photos – what did they show?

A. Yes, I was shown photos of pigeon infestation and guano in the plant rooms and on the external ledges of the building.

213. What action, if any, are you aware of having been taken to deal with these matters?

A. A specialist pest control company, GP Environmental Services were called in to clean the guano and install pigeon proofing.

214. What concerns, if any, did you have about water cascading down the walls? Is so, why and what was the consequence of this?

A. I don't remember seeing water cascading down walls.

215. Discuss your involvement, if any, with the Cryptococcus Sub-Group Meetings - actions taken, internal escalation: HPS involvement?

A. I was not a member of the Cryptococcus Subgroup.

216. What, if any, external reporting occurred?

A. I don't know

217. PAGs/ IMTs/ AICC and BICC involvement.

(No answer provided)

218. What steps were taken in response/ precautions put in place?

A. I don't know.

219. Did you read John Hood's report?

A. No.

220. When did you read John Hood's report?

A. I didn't.

221. What observations, if any, did you make after reading John Hood's report? What actions were taken following the John Hood report?

A. None.

222. What else could have been done? How could matters have been handled differently? What concerns, if any, did you have about how matters were dealt with?

A. I can't comment on that.

Staffing and Working Environment

200. What were the staffing levels like in estates at the point of handover? Where did the staff come from – were they mainly transferred from old site?

A. Estates staffing levels were not my remit at handover. At handover there had been a core team of Estates staff identified to work with Ian Powrie. As the hospital sites who would move into the new QEUH were still operational at this time their Estates Teams remained on those sites. So, there was only a small Estates Team working on the new buildings. As the old hospitals closed the Estates staff moved with them during the migration period

201. Concerns if any about staffing following handover – to what extent did the staffing levels manage the workload? **Refer to Bundle 8, document 40.**

A. I was aware Ian Powrie had concerns about Estates staffing levels. Ian had developed a workforce plan for the new Hospitals, but it had not been approved and he had to reduce the staffing. Given there were so many issues and defects with the new buildings the Estates staff were under extreme pressure.

202. Was appropriate training in place for new and existing staff on using new systems and working within the QEUH? How did you ensure that new and current staff were appropriately trained? Refer **to Estates Communications Bundle, document 5** - what was this and what was the training like? How did this assist you and staff with working at QEUH – was it equipment focus, asset focused? Please describe?

A. There was a training programme developed based on the identified training needs for each member of staff depending on their job function. This included

the training and familiarisation sessions provided by Multiplex and their contractors as well as building familiarisation and internal training. Attendance at training would often be impacted by staff having to respond to issues within the buildings and having to miss or leave training early. All efforts were made to ensure sufficient training was provided but more sessions and more in-depth training would have been beneficial. The work and training required to be undertaken during the 12-week commissioning period was extensive and with hindsight was not a sufficient length of time. Training also continued during the migration period as staff moved over from the remitting sites and also continued when the buildings were operational.

203. Who was responsible for providing staffing? Who was responsible for ensuring staffing was maintained at sufficient levels?

A. The line management structure for Estates and Facilities were responsible for providing staffing in accordance with the manpower plans and budgets that had been approved. Heads of departments, duty managers and supervisors were usually responsible on a day-to-day basis for ensuring the correct staffing levels were on duty through agreed duty rotas. Discretion to use overtime, excess hours or agency staff was normally allocated by senior managers. Agency staff were used extensively by domestic and catering staff initially until staff had migrated from other sites. I don't know if Estates used agency staff to fill in gaps on rotas.

204. What concerns did you have regarding staffing levels?

A. Staffing levels were a concern within the new buildings because there was new equipment, new systems and new methodology applied and it was unproven whether what had been forecast would meet the reality. Some staff were also anxious about moving due a new site especially the size and scale of the QEUH and additional support and reassurance was required.

205. What was the working environment like when QEUH opened – work life balance/ workplace culture? What issues, if any, did you have? If so, what concerns did you raise? Who did you raise these concerns with?

A. The working environment was intense, staff had to be very reactive and working days were long and exhausting many people were working 12 hours or more a day and sometimes 7 days a week. Managers tried where possible for staff to work with colleagues they knew. There were members of staff reluctant to have been moved and some did resist working in new ways.

206. Who was on site to manage and assist with carrying out works relating to equipment? How did this assist your workload in estates? To what extent, if any, was there a reliance on commercial third parties such as Multiplex when it came to staffing levels?

A. I can't comment on Estates staff at this time as I was not managing them but I am aware within Facilities Staff we did rely on third parties to support the Automated Guided Vehicles system and also, we had very many problems with the pneumatic tube system.

207. Generally – discuss the workplace environment and culture – what concerns, if any, did you have?

A. Within Facilities we had a very good management team and while concerned about the excessive hours they were working we did not have too many HR issues.

208. Describe the handover process – did it run smoothly or not? What concerns, if any, did you have in the run up to handover? What matters did you feel went to plan and what, if any, matters, had not gone to plan?

A. From my position as Facilities Project Manager I was anxious about the handover because I was aware how much work had to be done during the commissioning and migration period. I did not anticipate or appreciate the volume of work to be carried out by Multiplex and the members of their operatives who would remain on site after handover. The work by the Equipping and Placement Team during the commissioning period went very well and the patient migration went very well.

209. GGC took handover from Multiplex earlier than initially contracted for – what did you think about this? Why did it happen? What was the rationale for the early handover?

A. I did not think taking the building early was a good idea and I was not party to the reasons for this or taking the decision.

210. Were the concerns raised by infection control colleagues regarding the general build of QEUH/RHC taken seriously? What action did you take in response to these concerns, not already mentioned in your answers?

A. I don't recall specific issues being raised but to me about the General build but I wouldn't not take issues raised by Infection Control seriously.

211. Dr Teresa Inkster tells us in her statement that she raised concerns regarding the cleaning in NICU, PICU and haematology wards in 2016 and again raised concerns to you and Mary Anne Kane in 2018 raising concerns in relation to level 4 QEUH, Ward 2A, RHCG, PICU and Ward 3C, with further issues in relation to Ward 4C cleaning being raised in 2018:
What were the concerns raised and what action did you take?

A. If there were cleaning concerns raised in 2016, they may have been directed to Billy Hunter as General Manager. I do remember meeting with Dr Inkster and Suzie Dodds in early 2018 just after I was moved there as GM. They had raised concerns about the cleaning standards and as result additional cleaning hours were allocated to the ward as the cleaning standards were not what was required.

204. Do you agree with Dr Inkster that the *'response was reactive rather than proactive'*?

A. We regularly monitored the areas highlighted and our monitoring results were not highlighting any issues, so we were initially reactive to Dr Inkster's concerns. But I do believe we became more proactive after this and further concerns were not raised.

205. Is there anything further that you want to add that you feel could be of assistance to the Inquiry?

A. Just that everyone worked very hard to overcome a very difficult set of circumstances.

Declaration

I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

The witness was provided the following Scottish Hospital Inquiry Documents for reference when they completed their questionnaire statement:

Appendix A

A32993814 – Email from Currie and Brown to K Connelly – Ward Ventilation
A49267796 – GP Environmental survey to K Connelly - Feral Pigeon Infestation
A43255563 – SHI Bundle 1 – IMT Meeting Minutes
A43273121 – SHI Bundle 3 – SBAR Documentation
A42959603 – SHI Bundle 4 – SBAR Documentation
A43293438 – SHI Bundle 6 – Miscellaneous Documents
A43955371 – SHI Bundle 8 – Supplementary Documents
A47175206 – SHI Bundle 9 – QEUH Cryptococcus Subgroup Minutes
A47395429 – SHI Bundle 10 – Water Technical Group/Review Group Minutes
A47390519 – SHI Bundle 11 – Water Safety Group
A47069198 – SHI Bundle 12 – Estates Communications

Scottish Hospitals Inquiry
Witness Statement of Questions and Responses
Pamela Joannidis

This statement was produced by the process of sending the witness a questionnaire with an introduction followed by a series of questions and spaces for answers. The introduction, questions and answers are produced within the statement.

Professional History

1. Please list your professional qualifications, with dates.

A Registered General Nurse (RGN) March 1988; Registered Children's Nurse (RSCN) July 1992; Diploma Infection Control Nursing October 1996; MSc. Infection Control 2006.

2. Please give your chronological professional history. This should include roles held where and when. Please also provide an up-to-date CV if you have one.

A St Mary's School of Nursing, London, Student nurse, 1985-88. Belvidere Hospital, Glasgow, Staff Nurse, 1988 – 1990. Royal Hospital of Sick Children (RHSC), Yorkhill, Student nurse 1990–1992. RHSC, Staff Nurse 1992 – 1994. RHSC, Yorkhill, Infection Control Nurse (ICN), 1994-1998; RHSC, Yorkhill, Senior Nurse Infection Control 1998 – 2007; South Sector, NHS Greater Glasgow and Clyde (NHSGGC), 2007 – January 2013. Lead Infection Prevention and Control Nurse (LIPCN); covering RHSC, Victoria Infirmary, Southern General Hospital, Mearnskirk Hospital and Mansion House Hospital NHS GGC, January 2013 – March 2019 Nurse Consultant IPC (NC); Between October 2015 – March 2017 I was asked to set up a new paediatric IPC team for the Royal hospital for Children (RHC). This I did part-time. I returned to my NC duties in March 2017. In March 2019 I was seconded into a post to support the Associate Director of Nursing, IPC, who would be undertaking Infection control manager duties. I was acting Associate Director of Nursing from March 2019 – March 2022. In March 2022 I retired from NHS GGC. In September 2022 – current , part time post as a Professional Nurse Advisor IPC(PNA), for the HAI Policy and Adult Social Care Units, Scottish Government.

3. What specialist interest / expertise / qualifications in any area of Infection control do you hold? E.g., hospital ventilation, water Legionella control and infection control related to the built environment, and epidemiology and outbreak management.

A I do not hold any specialist qualifications in area of IPC other than my diploma and Masters degree. I have an interest in quality improvement in clinical practice.

Infection Control Team

4. Please explain your role in the management of infections at QEUH/RHC and in the IMT structure from January 2015 to date. Please also identify to whom you reported and who reported to you at all points from January 2015 to date. In effect we need a mini CV covering this period role by role

A January 2015 – October 2015 – I held the post of NC reporting to Sandra Devin. With regards management of incidents of infection, I would attend to support the local IPCT at the request of the ICM/ICD/ANDIPC to undertake investigations to support hypotheses as required by the IMT and within my scope of clinical practice. October 2015 – March 2017 NC/Lead IPCN Paediatric Team reporting to Sandra Devine. As Lead IPCN, I would work closely with the ICD and IPCNs to identify and manage incidents of infection. I would support PAG/IMT meetings by attending in person or supporting a member of the team to attend. The nursing team would undertake the initial investigation into new patients, working with clinical and microbiology colleagues to gather data to present to PAGs/IMTs. I would ensure that actions requested for the IPC nursing team by the IMT would be completed. March 2017 – March 2019 NC reporting to Sandra Devine. When a full time LIPCN was appointed to the paediatric team, I returned to my role of NC. At this time I was asked to support the new Lead IPCN in the paediatric team, Susie Dodd. At some point I was asked to be line manager to Susie (sorry I don't remember the date). I did this until she moved on secondment to ARHAI. My role of NC was as previously described. In March 2019, I was asked to take on enhanced duties to support the AND IPC. This included line manager for the LIPCNs and

attendance at PAGs and IMTs as directed by the ICM to support investigation into incidents and outbreaks. I would also ensure that the IPC nursing team had enough support during investigation of incidents. In March 2022 I retired from NHS GGC.

5. Can you explain the respective roles within the infection control framework of:

- the Microbiology department
- Estates and Facilities.
- Public Health; and
- external experts (i.e., Public Health England).

A The Microbiology department works in partnership with the IPCT, ensuring provision of microbiology advice, i.e. appropriate specimens, reporting results and advising on antibiotic treatment. Some Consultant microbiologists and clinical scientists have IPC duties in their job descriptions. Infection Control Doctors (IPCD) are generally lab based consultant microbiologists, either full time or part-time. The IPCD is a member of the IPCT and liaises daily in the management of any incidents. They will usually make the decision to call a PAG or IMT and will on most occasions be the chair. The Estates and Facilities are responsible for maintaining the built healthcare environment. This includes cleaning, maintenance, repair and monitoring. The estates and facilities team will be members of the IMT, undertaking investigations and providing advice on the health care built environment at the request of the IMT to support hypotheses. They provide audit reports on cleaning and estates issues to the IMT as required. They organise water and air sampling, annual validation for ventilation systems and provide assurance to the board with regards aspects of ventilation and water quality. Public Health teams are employed by a health board and are responsible for providing advice during outbreaks of infection in the community including care homes. They have a statutory role to provide advice under the Public Health Act for incidents and outbreaks. They provide support and advice to health boards during higher prevalence of organisms such as Influenza in the community. They will work closely with IPC and microbiology teams as members of the IMT where an incident crosses between

both hospital and community. Depending on the type of incident, a Consultant in Public Health Medicine may be asked to chair an IMT.

6 What were your impressions of the GGC infection control team in 2015. Were you aware of any of the following:

- existing tensions?
- lack of clarity around roles and decision making?
- relationships (i.e., between ICM and ICD)?
- record keeping- did AR or LI take part in this?
- culture and bullying;
- attitude of senior management and board to infection control issues?

A In 2015 I was not aware of any existing tensions nor do I recall a lack of clarity around roles and responsibilities. There were good working relationships between LIPCNs who met weekly to provide support to each other. The LIPCNs did not report any instances of tension or bullying that I recall. I believe the ICM and the LICD had a good working relationship. I think AR and LI were working in ARHAI in 2015 and I am not aware of any role they had in record keeping in NHS GGC at that time. I understood IPC to be high on senior management and board agenda with IPC tabled at board and governance meetings. The Vale of Leven report had been published in 2014 and the recommendations were a priority for the board.

Involvement with QEUH prior to opening

7 Please describe any involvement you had prior to the opening of the hospital in June 2015 in each of the following stages. For each stage , a) When were you first consulted b) Who consulted you? c) What advice did you provide from an infection control perspective and d) Was it followed?

a) Planning/ design stage

A I was invited by Annette Rankin (AR) (my line manager at that time) to attend preliminary 1 in 200 planning meetings with a number of adult clinical teams

and the new hospital senior project team. Preliminary schematic drawings were reviewed which showed layout for each adult clinical area. These meetings were primarily to discuss the general layout and space / square footage each service would get. I noted that provision had been made to accommodate clean and dirty utility rooms and linen and waste holds. It was not possible for me to attend all the meetings requested by the project team and I stepped back to continue in my full-time post as a LIPCN for the south sector. A full time nurse consultant was appointed from my nursing team to join the senior hospital project team. This was Jackie Barmanroy and she joined the project team full time for 2 to 3 years. I cant recall the exact dates.

b) Construction stage

A I had no formal role at this stage (other than as described above)

c) Commissioning and Handover stage.

A I had no formal role in the commissioning or handover stage.

8 In particular were you asked for information/ advice about vulnerable patients, such as the immunocompromised?

A I don't recall being asked formally to advise on vulnerable patients.

9 With regard to ventilation in particular, were you consulted or briefed about the specifications of the ventilation system of the hospital before it opened?

A I remember a meeting where I was asked how many mechanically ventilated isolation rooms (for children with infection) in each of the children's ward there should be. Alan Seaborne, Dr Hague, Dr Williams and Annette Rankin were in attendance. There would not be an infectious diseases unit in the new children's hospital. We agreed on at least 2 rooms in each ward for infectious diseases. This was not based on any data we had. At this time the children's hospital was to be 100% single room accommodation. I did not sign any final plans on this. I attended an Operations group just before the new children's hospital opened. The role of this group was to discuss operational issues in moving to the new hospital and which included planning the transfer of patients. I was asked if the

theatre ventilation would be commissioned and ready to use at transfer. I asked a member of the hospital project team and was advised that all commissioning would be undertaken and completed prior to patient transfer. I relayed this to the senior IPCT and to the Operations group chair.

10 Were you shown any plans/ specifications for particular wards?

A I was shown a number of plans at the meetings I attended at the early planning stages. I was also asked to consider the location of sinks by the hand hygiene coordinator who was working with the project team on sink location and placement of liquid soap and paper towel dispensers.

11 Did you undertake any site visits prior to the hospital opening? For what purpose?

A I was invited on site during construction to consider the IPS panels at back of hand wash sinks and what should go on them i.e. paper towel and soap dispensers. I was asked by Sandra Devine to undertake a site visit of the RHC with Lead Nurse Maureen Taylor. The wards were still under a considerable amount of construction therefore we both agreed it was too soon as I was not able to view several areas. I relayed this to the LIPCN for the south sector team. I also recall that group tours were provided by the project Team during construction and I did a few of these.

12 Were you required to sign off any design matters? If so please give details

A I don't recall signing off on any design matters.

13 Were you involved in transferring patients from the old site(s) into QEUH? If so please describe your involvement.

A Yes. The Operations group described their plans to move immunocompromised and infected patients in single individual ambulances. I agreed with this.

a) Did you encounter any problems? If so what were they?

A I was not involved in the actual transfer of patients and am not aware of any problems.

14 What was your first impression of the hospital when it was first opened? Did you have any concerns from an infection control perspective? If so what were they?

A It took me some time to work out where the adult and children's services where in relation to each other. My first reaction was that it was very big and the foot fall enormous. It looked new, clean and modern.

a) Are you aware of any ICPT colleagues who had concerns? If so what were they?

A At the point of opening the new hospitals I do not recall being made aware of any concerns with the new hospitals other than the snagging issues identified by the IPC nursing teams such as chipped or damaged work surfaces and cupboard doors. These were on a list to be replaced.

15 From an infection control perspective, do you have a view on whether the proximity of the hospital to sewage works causes a risk to patients? Please give reasons for your answer.

A I don't know of any risk linked to the sewage works. I know that concerns had been raised when the site was proposed for the new hospitals. I was told that a feasibility study took into account this fact and that the risk was from the occasional unpleasant smell only.

Infection Control in General

16 What do you understand by the term HAI? What is the distinction between Hospital Acquired Infection and Healthcare Associated Infection? Is the distinction always made?

A HAI is the acronym for Hospital acquired infection. It refers to colonisation or infection by most organisms acquired by a patient not present on admission to hospital. It is usually considered to be 48 hours (ARHAI guidance) or more after admission. Healthcare associated infection is colonisation or infection associated with receiving healthcare whether in hospital or not.

17 To what extent is infection – whether endogenous or arising from the environment - always a risk for certain sorts of patient? Is there a limit to what can be done to prevent this? Are there certain sorts of infection that can be expected to arise no matter the level of care taken in relation to IPC/hygiene?

A Certain patient groups are at a higher risk of acquiring an infection due to either their condition e.g. auto-immune disease, prematurity, as a result of medical procedures, or associated with medication such as antibiotics, steroids, chemotherapy. Some patients have long-term invasive medical devices in situ which can act as a door way to otherwise sterile sites in the body such as intravascular devices or urinary indwelling catheters. The application of good basic infection control as advised in the National Infection prevention and Control Manual (NIPCM) such as hand hygiene, clean environment and medical devices and wearing of appropriate personal protective equipment can reduce the risk of acquiring an infection. Some patients are given prophylactic antimicrobial medication as a protective measure.

The most vulnerable patients can be protected further by controlling the environment in which they are cared for. This can include mechanically ventilated accommodation in hospital where only highly filtered air is introduced in to the bedroom such as that provided for transplant patients. While this will greatly reduce the risk of infection it will not remove the risk completely. The reason for this is that the air, while highly filtered is not sterile, the equipment, laundry, food, personal belongings and people (and their clothes) coming in and out of the room are not sterile. Where the patient receives care as an out-patient, or where the patient is out-on pass during their in-patient stay the environmental risks posed by being out of a healthcare environment cannot be controlled.

18 Can you describe the procedure for monitoring and reporting HAIs within NHS GGC and escalation to HPS and the Scottish Government.

A Organisms from specimens are reported to the IPCNs either directly by a consultant microbiologist or via an IT system called ICNet. The IPCN, ICD or Consultant microbiologist will give advice to the ward if the patient requires to be isolated in a single room with additional precautions in place. The IPCT will determine if the patient has been admitted with this organism or acquired since admission by looking at date of admission, date of specimen and symptoms and also by looking at past specimen results. If likely since admission, the IPCT will consider a source and be on general alert for further cases.

The ICD will decide on the need for a PAG (problem assessment group) to discuss actions. Depending on the organism, 2 or more cases, a single case, or a number more than expected would constitute an outbreak and an IMT will be held. An assessment tool developed by HPS called the HIIAT (Hospital infection and incident tool) was used and initially those incidents assessed as Amber or Red were reported to HPS by completing a form called the HIIORT (Hospital Infection and Incident Reporting Template).

At each IMT, the assessment was undertaken and agreed by those in attendance and updates sent to HPS. In the last 10 years there have been further developments of these national assessment and reporting tools and reporting is via an electronic system. All incidents (whether assessed as Green, amber or red) are reported to ARHAI. It is my understanding that ARHAI could / can report incidents to the Scottish Government at any time. I cannot comment on what happens in NHS GGC currently.

b) The practical operation of the system within the QEUH, including barriers to reporting HAIs data collection for different types of infections – fungal, gram negative, gram positive, other; and the use of data sets for infections

A I am not aware of barriers to reporting HAIs. NHS GGC IPC team started to provide data as statistical process charts (SPC). HPS provided guidance on the creation of these charts. Where requested epidemiology reports were provided by HPs/ARHAI for IMTs. I don't recall the date but possibly post 2018 charts were created for Gram negative organisms in high-risk areas for Serratia, Acinetobacter, Pseudomonas and Stenotrophomonas (These organisms had been added to the NIPCM). SPC charts were also used to monitor Staphylococcus aureus bacteraemia and Clostrioides difficile. Data is provided as part of the mandatory surveillance programme, to ARHAI for production of quarterly and annual reports. I cannot comment on current practice in NHS GGC.

c) The involvement of HPS and the SG HAI Policy Unit, especially what level of oversight there is in practice. Also, what does the oversight look like- formal or informal, meetings, emails or phone calls etc?

A ARHAI are responsible for the provision of national IPC guidance in the National Infection Prevention and control manual (NIPCM). This includes guidance on the assessment, management and reporting of incidents. ARHAI can be invited to join an IMT where the members require support to manage an outbreak. That support is determined by the IMT and can be undertaking epidemiology of a specific pathogen, undertaking a literature review to provide latest evidence or to reach out to other health boards, nations etc to seek advice to provide to the

IMT. ARHAI may also provide advice from experience of supporting other similar incidents. ARHAI report all incidents assessed at Amber or Red automatically, to the SG HAI Policy Unit but can chose to report any Green incidents also. ARHAI provide assurance to the SG HAI Policy unit or may notify the unt if they have concerns. ARHAI also provide supporting materials contained with the NIPCM that will be used by IPCTs to assess , manage and report incidents.

d) What is your opinion on the adequacy of the system?

A The system for assessing and reporting incidents has been developed over the last 10 years. In 2015 the NIPCM contained guidance on Pseudomonas aeruginosa in high risk units and a water safety checklist. I do not recall there being national advice on the management or investigation into environmental organisms including fungi in the built environment. The HIIAT assessment tool was easier to use for incidents involving organisms where more was understood about source and route of transmission such as MRSA. The assessment criteria changed but I do not know when. In 2015 there was little or no advice on the management of water-borne infections in the NIPCM. Limited national guidance on water incidents became available (post 2018) with the publication of Chapter 3 of the NIPCM. Chapter 3 has been developed further and there is now a comprehensive section on managing and reporting incidents. ARHAI are developing a 4th chapter in the NIPCM which could provide guidance for IPCTs and health boards on strategies for reducing the risks of infection associated with water and ventilation.

e) How might it be improved?

A IPCTs require support with incidents linked to the built environment both in identification of source and also in actions to control transmission. There needs to be studies to aid the understanding of Gram negative organisms in patients who are at a higher risk of colonisation / infection. There needs to be guidance on screening samples in the environment and on actions to be taken when environmental samples are positive. For example, drains will have environmental organisms in them.

Therefore, guidance on if, when and how drain sampling should occur is required including what is normal. There needs to be agreement on actions to be taken that make the environment safe and still allow treatment to continue. I would expect there to be an expert body who would provide the best evidence and subject matter expertise on the built environment infection risks to support IMT members. An increasing number of patients receive their treatment either as out patients or at home. There will need to be further clarification on how to assess and manage incidents where exposure to environmental organisms can be in and out of hospital.

Concerns about infection

15 Do you have any specific concerns about amounts, locations, clusters or types of infection within the hospital from the time of its opening to date? If so, please elaborate?

A In 2018, there was an increase in Gram negative blood stream infections reported from paediatric patients in ward 2a/b. An IMT was established and ARHAI invited to attend. This was a very vulnerable group of patients. When the service in Ward 2a in RHC was decanted to Ward 6a in adult QEUH there were further incidents. I was concerned as I would for any incident of infection. I knew that a huge number of actions were undertaken by clinical, estates, facilities and IPCTs to investigate these incidents including support from ARHAI and advice from other nations. I had no previous experience of Cryptococcus. I think that was the same for most of the IPC nurses. These organisms although not new, were new to us and the IMT was a learning experience for us.

16 Does the extent of infection observed in QEUH differ from what might have been expected before the hospital opened? Why/ why not?

A I would not have expected to see the rise in Gram negative infections in 2018. I thought a new building would pose fewer risks of infection from the environment compared to an old hospital building. I understood that all national guidance had been used in the design, planning and commissioning of the

hospitals. In terms of novel or rare organisms, I think they could happen whether its old or a new building.

17 Do you have concerns that patients are/ were at increased risk of infection from exposure to pathogens via the water supply or drainage system?

A Yes I had concerns. The increase in Gram negative environmental infections was discussed at a number of IMTs. While investigations were undertaken to discover and understand the source and route of transmission of these organisms, patients were at risk of infection. Actions were taken at every IMT to safeguard patients. I cannot comment on the current situation in NHS GGC.

18 Do you have concerns that patients are/ were at increased risk of infection from exposure to pathogens via the ventilation system?

A I know that patients in the Ward 4b (BMT) were moved back to the Beatson when concern was raised about the function and effectiveness of the ventilation system in the bedrooms. I am also aware that reports at IMTs described tears in duct work and problems with HEPA filters. This was a concern as the risk to patients was not immediately identifiable. Transplant patients are at increased risk of air borne infection and for this reason rely on specialised ventilation for protection in their rooms during parts of their treatment. I am not a subject matter expert on ventilation. I cannot comment on current risks.

Particular issues

This section deals with particular instances of infection with which you were directly involved in ; please refer to IMTs where appropriate

Early issues with Ventilation (Adult BMT Unit)

19 In respect of the BMT, when did the concern arise?

A I do not recall the exact time but not long after the service was transferred over.

a) What was your role in this- how were you involved?

A I'm sorry this was 9 years ago so I don't remember all the details. I was asked to attend a meeting to discuss the Adult BMT ventilation on behalf of Sandra Devine who was on annual leave. The Director of regional services chaired the meeting. Concerns were tabled at this meeting re the inadequacy of the ventilation system. Options were presented and those present agreed that the patient group should be transferred back to the BMT unit at the Beatson, Gartnavel site to facilitate remedial actions to the ventilation system.

b) What was the nature of the concern – specifically what was thought to be wrong with the building system in question?

A I don't recall the specific details of why the ventilation was considered to be inadequate but that it required adjustment. I think the adult BMT was not originally intended to be on the QEUH site.

c) What was the nature of the risk posed to patient safety and care?

A Patients undergoing bone marrow transplant are at risk of infection with all organisms but especially fungal infection due to having a weakened or no immune system.

d) What was your role in this? What actions did you take?

A I attended the meeting and agreed that patients required to be moved. I recall being asked to undertake a visual inspection of the rooms in the ward with a colleague but I don't recall the details of this.

e) In your view was the action taken sufficient to address the concern?

A I don't have enough information or knowledge of ventilation systems to answer this question.

f) You co-authored a summary report. Please explain how this came about- who asked you to prepare the report?

A I don't recall. I remember being asked to undertake a visual inspection of the single rooms which I did with one of the SIPCNs from the adult IPC team.

g) What were your findings?

A I don't recall and I don't have access to the report.

h) What did GGC do with the report? Please provide a copy if you are in a position to do so.

A I don't have access to the report.

20 During the emergence of issues in the adult BMTU, what consideration was given to the adequacy of the ventilation system in the paediatric BMTU?

A There was a request to consider the paediatric BMT in light of this concerns raised about the adult BMT. I recall discussions about air differentials and a review of seals around doors, windows and fittings to improve this. Rooms were vacated while work was undertaken.

Specific issues with the water system refer to IMTs

For each of these incidents please refer to the specific IMT

21 SERRATIA OUTBREAK IN NICU in 2015

a) When did the concern arise?

A I attended an IMT to discuss an increase in Serratia in October 2015. There had been previous cases as reported that year in the IMT minutes.

b) What was the nature of the concern – specifically what was thought to be wrong with the building system in question?

A The IMT considered a number of sources including sinks and taps and a range of equipment in the unit. A review was undertake of the cleaning provision in the unit also.

c) What was your role- what were you asked to do, if anything?

A I was asked to step in as the Lead IPCN for the Paediatric IPCT taking over from Clare Mitchel. I started in October 2015 and was part of the IMT from then on. I updated on patient cases at each IMT I attended. I was asked by the chair to undertake a number of agreed actions. Those included: drafting an information leaflet for parents / carers to provide written information to accompany what they were being told about the incident; to take swabs of reusable equipment in the unit and environmental swabs of sinks/taps; to undertake training on SICPs to support self-monitoring; to support a walk round of HPS staff to see the unit; to undertake SICPs audit and feedback and also to consider a proposal for a new tap. I am not an expert in taps or tap design so my action was limited to asking if it met the standards in SHTM 64.

d) What was the nature of the risk posed to patient safety and care?

A Patients with Serratia marcescens either colonisation or infection were presented at the IMT. Neonates can have Serratia colonising their gut. The hypothesis being investigated by the IMT was that the source was either patient or environment (or both). There was a focus on staff applying standard infection control precautions including hand hygiene, cleaning of the environment and of

reusable equipment. There was also extensive environmental swabbing including sinks, taps, equipment, keyboards weighing scales etc. Actions included a review of cleaning services to the unit and replacement taps. The severity of illness using the HIIAT tool was assessed as minor as none of the patients were giving cause for concern. Patients identified previously were discussed. Typing of all cases were compared. There was extensive environmental screening.

The HIIAT assessment was based on 4 criteria severity of illness, impact on service, public anxiety and risk to public health (since changed to risk of transmission). The IMT would have opportunity to reassess the HIIAT at each IMT (including if extra meetings were arranged) using each of the criteria.

e) Was any action taken sufficient to address the concern?

A Yes. There were a number of actions taken. These included training and monitoring of SICPs and a review of the cleaning service provided by the facilities team. HPS were invited to be members of the IMT to support the actions at each meeting. Taps were replaced. The IMT were able to bring the incident to a close with no new cases reported. The incident reflected how challenging this specialised environment is in terms of vulnerable patients and complex reusable medical equipment.

f) Can you comment on the effectiveness or otherwise of the IMT?

A The IMT followed the standard agenda for an IMT and invited HPS to advise at each meeting. The membership was inclusive of clinicians, estates, facilities and IPCT. The focus was on investigations to identify a potential source(s) and actions to control transmission. There was also focus on care of patients and communication to parents and staff. Actions were taken to provide support for proposed hypotheses. HPS provided advice and support.

VARIOUS INFECTION INCIDENTS IN 2018 – "Water Incident"

22 When did the concern arise?

A March 2018 Dr Inkster arranged an IMT to discuss patients with environmental organisms.

a) What was the nature of the concern – specifically what was thought to be wrong with the building system in question?

A The IMT took action to investigate a possible environmental source of Cupriavidus. Sampling identified multiple water sources with Cupriavidus, Pseudomonas and fungi. Water tanks were negative and it was hypothesised that the outlet was the source rather than the water supply. Taps were removed and disinfected. The taps had plastic flow straighteners in them to reduce splashing. These were removed as a potential reason for growth of organisms.

b) What was your role- what were you asked to do, if anything?

A I attended at least 1 of the IMTs for the Lead IPCN. I wasn't asked to action anything.

c) What was the nature of the risk posed to patient safety and care?

A The risk to patients was exposure to environmental Gram negative organisms from the water outlets. The risk of transmission was assessed at each IMT as major.

d) Was any action taken sufficient to address the concern?

A Actions were taken immediately to investigate a source to inform actions to control infection risk. Following identification of organisms, water outlets were immediately removed and patients supplied with alternative water supply for washing, drinking etc. Expert advice was sought from HPS, HFS and PH England. Consideration was given to other positive outlets and extensive water sampling across QEUH was undertaken. Point of use filters were placed on water outlets. Communication was provided to patients / parents. I think these actions supported identification and control of the source of these organisms.

e) Can you comment on the effectiveness or otherwise of the IMT?

A An IMT was arranged in March 2018 with appropriate membership. Additional expertise was requested as necessary (e.g. HFS and PH England). Investigations were appropriate to support the hypothesis of an environmental source and control measures were in place to protect patients. HIIAT tool was used at every meeting to assess the current situation and this reported to HPS and Scottish Government. The IMT agreed to more widespread sampling once results for Ward 2a were known. A number of actions were agreed at each IMT and reported at subsequent meetings. Actions included communication to staff and parents / patients Actions and outcomes were recorded on the IMT action plan.

23 Cryptococcus in 2019- refer to IMT

a) When did the concern arise?

A I don't recall the date of the patient cases but note from the provided minutes that the first IMT was on the 20th December 2018.

b) What was the nature of the concern – specifically what was thought to be wrong with the building system in question?

A Dr Inkster described an organism that was rare and found in pigeon droppings and soil. The concern was that potential route of transmission was following entry of these organisms into the building. The IMT chair described a hypothesis that the organism could have entered the building via the ventilation system.

c) What was your role- what were you asked to do, if anything?

A I attended some of the IMTs. I was asked by Sandra Devine to prepare an aide memoire for CDU staff to familiarise them with the rooms in ward 2a.

d) What was the nature of the risk posed to patient safety and care?

A The risk was infection with Cryptococcus neoformans in people whose were immunocompromised and therefore at risk of infection.

e) Was any action taken sufficient to address the concern?

A Following description of the known sources of this organism, the IMT focussed on the physical environment for evidence of pigeon droppings and potential routes of transmission from these to the cases. Microbiology testing was undertaken including air sampling in a number of areas including wards and plant rooms. Other actions included cleaning of all plant rooms, pest control actions to reduce the number of birds on the site, prophylaxis for haem-onc patients, clinician awareness for further cases and testing and advice from external experts on ventilation and possible mode of transmission.

The IMT hypothesis expanded to include not only Cryptococcus but also other fungus when air samples in wards in QEUH were positive. A plan was agreed to move patients from Ward 6a to CDU and CDU patients to Ward 2a. This would allow for remedial works to be undertaken in Ward 6a. The incident had been assessed using the HIIAT assessment tool and reported to HPS following the first and subsequent IMTs. HPS updated the Scottish Government after IMTs also.

f) Can you comment on the effectiveness or otherwise of the IMT?

A The IMT consulted an external expert to inform the investigations and action. The pathogen was new for most people on the IMT particularly those who were not microbiologists. There was new learning about the nature of this organism. There were many IMTs all chaired and undertaken as per standard agenda for an IMT. Experts were invited in to the IMT to provide additional information to support understanding of actions required. All actions agreed were undertaken. Extensive environmental sampling was undertaken. It is my understanding that Cryptococcus neoformans was not found in the environment but that Cryptococcus albidus was. Despite further samples positive for fungi including Cryptococcus I do not recall any further cases reported during this incident.

g) Prior to this incident, how many times had you come across Cryptococcus either in environmental testing or in a blood sample?

A I had never come across this organism before.

h) Other than the two cases already in the public domain ([redacted] and the paediatric patient) are you aware of any other patients with Cryptococcus in QEUH? If so please give details.

A I am not aware of any other patient in QEUH with this organism.

i) As you will be aware, a cryptococcus sub-group was set up to investigate the incident, culminating with the writing of a report by Dr John Hood. Have you read his report?

A I have not read the report.

j) If so, to what extent do you agree/ disagree with his findings?

A NA. It is my understanding that the investigations undertaken by Dr Hood were extensive. I do not have the expertise to comment on whether these were the right actions.

20 Gram Negative Bacteria in 2019 refer to IMTs

- When did the concern arise?
- What was the nature of the concern – specifically what was thought to be wrong with the building system in question?
- What was your role- what were you asked to do if anything?
- What was the nature of the risk posed to patient safety and care?
- Was any action taken sufficient to address the concern?
- Can you comment on the effectiveness or otherwise of the IMT?

A February 2019, NICU, Serratia incident. IMT was held to discuss new cases of Serratia colonisation in neonates. The membership included estates, facilities, clinicians and IPCT. The IMT used the standard agenda for incident meetings and HIIAT assessment was used. Action plan included hypotheses and extensive action plan to support investigations and ensure controls. Drain

swabs were positive and action was taken to disinfect drains. Plans included the use of hydrogen peroxide vapour which would facilitate cleaning of fixed and mobile complex reusable medical equipment. I attended some of the IMTs to support the IPCNs but was not asked to action anything. The HIIAT assessment was used at each IMT. The IMT closed the incident when no further cases reported and all actions completed.

June 2019, Ward 6a, Gram negative incident. I began attending the incident meetings in August 2019. The IMT met to discuss an increase in Gram negative blood cultures in paediatric haem-onc patients in Ward 6a. Membership was appropriate and as the incident progressed others were invited. This included Professor Craig Whyte and Lesley Shepherd from Scottish Government. There was also a change in chair. I was asked to undertake a root cause analysis of the patient cases to determine all possible sources and routes of transmission to inform actions and control measures. The data collection tool developed for this was approved by the IMT and HPS who had additional comments incorporated.

The clinician of each patient was interviewed as part of this process. The report was tabled at the IMT once completed. The IMT recommended a revision of Chapter 3 of the NIPCM in light of this incident. There were differing opinions on the source and nature of the risk to patients in the ward from microbiologists. This was discussed at the IMT. I think given the complexity of the incident, lack of experience in specialist environmental issues and lack of national guidance, a difference in opinion could be expected. All proposed actions were approved via the IMT process.

A number of measures were proposed to provide ongoing assurance to allow the incident to be stepped down. These included; all new single Gram-negative cases undergo a root cause analysis rather than waiting for 2 or more cases; weekly enhanced supervision ward rounds that included senior nursing staff, facilities and IPCT; SPC charts for positive blood cultures with trigger levels for early warning; an SOP with detail on routine environmental

sampling including water, air and chill beams (approved by HPS). I felt this incident was complex and required advice and expertise beyond the IPC nursing team in NHS GGC. I believe that everyone involved was invested in taking all actions and preventative measures necessary to reduce the risk to patients to allow services to continue. I think services (facilities, IPC, public health, estates, clinicians, press, HPS and Scottish Government) worked collaboratively to find a solution to a very challenging incident.

November 2019, PICU, Pseudomonas incident. IMT was held to discuss 2 cases of Pseudomonas aeruginosa in 2 PICU patients. The membership included estates, facilities, clinicians, HPS and IPCT The Scottish Government were kept informed and provided advice also. The IMT used the standard agenda for incident meetings and HIIAT assessment was used. Action plan included hypotheses and actions to support investigations and ensure controls.

Water samples were undertaken in the unit and also areas of the patients pathway including Th 8. All water samples were negative. I attended the IMT to support the new Lead IPCN for the paediatric team. I provided information to the clinical teams on a new product used in paediatric haem-onc patients which fitted on the end of central lines. The clinical team agreed to trial this product. The IMT considered previous reports of Gram negative organisms. There was discussion about the number of air changes in bedrooms of the two patients with Pseudomonas. HEPA filtered units had been mobilised for use in the ward. Dr Leonard considered the ventilation as part of the hypothesis.

I was asked to share the SOP on isolation rooms in the QEUH. This documented each of the mechanically ventilated tooms on the site and the type of ventilation they had e.g. PPVL , negative pressure. This SOP had been written by Dr Inkster and myself for approval through the board IPC committees and was provided to inform staff what each ventilated room was and which patients it could be used for. The HIIAT assessment was used at

each IMT. On the advice of the Scottish Government, the incident team considered all organisms reported collectively in one IMT and there was a retrospective look back to August 2019 for cases. Extensive environmental sampling was undertaken and 1 drain swab was positive for Serratia. Consideration was given to the fact that the patient had been previously colonised with Serratia therefore the significance of the drain being a source was unclear.

The IPC surveillance team created SPC charts for Gram negative organisms to support data collection and reporting. I supported the IPCN to undertake a case review for each of the 2 pseudomonas patients as part of the investigations using the same data collection tool created for the Ward 6a patient reviews. HPS were invited to the IMT. The Scottish Government were informed and the IMT followed the advice of both HPS and Scottish Government during the management if this incident. The incident was closed when there had no further cases reported and all actions completed.

21 Unusual pathogens in orthopaedics in 2021 refer to IMTs

a) When did the concern arise?

A I don't recall the specific dates when patient cases were identified. The IMT met in January 2021.

b) What was the nature of the concern – specifically what was thought to be wrong with the building system in question?

A This incident was not linked to a building system. The source of surgical site infection following orthopaedic surgery with environmental organisms was linked to Ballotini beads used in the surgical procedure. Samples taken from unused beads had the same organism as the patients. The company that produced the beads reported this finding themselves in early January. Sandra Devine notified HPS and asked that other IPCTs in Scotland are informed.

c) What was your role- what were you asked to do, if anything?

A I wasn't asked to participate in this IMT.

d) What was the nature of the risk posed to patient safety and care?

A The risk was infection associated with orthopaedic surgery where Ballotini beads from a specific batch were found to be contaminated at point of manufacture. Once these were withdrawn the risk to other patients was removed. Patient cases with infection were treated.

e) Was any action taken sufficient to address the concern?

A Beads from the specific batch were sent back to the company. Other health boards were informed via HPS.

f) Can you comment on the effectiveness or otherwise of the IMT?

A The IMT identified the source and took action to remove this. The IMT ensured that there was communication to other health boards of the risk from the contaminated batch of beads.

Water supply – General

22 Other than the particular issues described above, did you have any other concerns about the water supply since January 2015? In particular were you aware of any of the following?

a) Water temperature: problems with energy plants – hot water temperatures are not high enough to prevent/tackle bacterial growth.

A I don't recall problems with an energy plant and temperature control in water.

b) Thermal control design system.

A I was aware that estates were examining the thermal mixing valves and I think it was decided to change the tap design taking these out. I recall Dr Inkster sampling dismantled taps and reporting bacterial growth that was considered a potential source.

c) Flow straighteners / regulators / tap type

A I remember a group had met with HPS to discuss choice of taps for the new hospital. It was a potential hypothesis that the plastic flow straighteners were a risk for bacterial growth. This may also have had to do with the thermal mixing valves.

d) Debris in pipes

A I was asked to lead a group of IPCNs to look at all sink drains and describe if there was any obstruction to flow. This was a visible inspection. The data was collected and provided to estates. I recall raising a concern that there appeared to be putty-like material in the join between the sink outlet and the pipe. Estates explained that this was a spigot joint. I also recall reports of foreign bodies such as syringes and toys noted on inspection by other IPCNs.

e) Single room design – water outlets increased; flushing regimes; risk of stagnation.

A I was not involved in the design of the single rooms. Each bedroom had a clinical hand wash sink in the main room for staff to undertake hand hygiene. There was a second sink and shower in the ensuite. This was no different to the single rooms in the old RHSC. I was a member of the Board water safety group to provide clinical IPC advice. The group were responsible for the development of the Board water safety Policy and scheme. This document did include advice on flushing regimes for staff to undertake and a recording sheet.

f) Pipe size and storage volumes; encourages water stagnation

A None.

g) Wet rooms and floor levels

A While I was Lead IPCN for the Paediatric service I was asked to look at an ensuite room where the shower water had moved out of the ensuite into the bedroom. We spoke to estates who reviewed the room and determined it was clean water running out into the bedroom while using the shower due to the camber of the floor. Work was undertaken to remedy this.

h) Drainage system

A None.

23 Do you consider there to have been a risk of infection from the water supply? If so, explain why.

A Yes. Disinfection of the water supply with chlorine dioxide and also the use of point of use filters on all water outlets reduced the number of positive cases. This would indicate that there was a potential risk from either the water supply or contamination of the outlet itself.

a) What remedial measures were taken as a result? eg. room closure and cleaning; ward closure; investigative and remedial works?

A Where a patient had a positive blood culture, the patient was moved, the room closed and samples taken before decontamination of the room including drains. Where no positive results were identified the room would be put back in to use. Point of use filters were put on all water outlets, disinfection using chlorine dioxide and drain cleaning were actions taken. There was also extensive water sampling undertaken.

b) Do you consider the issues with the water system (including drainage) have been resolved, or do you still have concerns? Please give reasons.

A I am not in a position to answer this as I left in March 2022.

The ventilation system

24 Other than the initial problems with the BMT what concerns did you have about the ventilation system since January 2015?

A I am not a subject matter expert on ventilation. I was present at IMTs where ventilation issues were discussed. I was aware that remedial actions including decanting of patients to other wards as described above were undertaken. I know that work was undertaken to ward 2a/b to upgrade the ventilation.

25 In particular were you aware of any problems associated with any of the following:

a) Presence of HEPA Filters

A The condition of HEPA filters were discussed at IMTs where estates had been asked to review the function. I recall estates reporting to IMTs that some filters were either missing or not installed correctly.

b) Air Changes Per Hour (ACH)

A The IPCT were informed that the ACH in the bedrooms was 3 ACH and not 6. We were told this was due to there being chilled beam technology that did not require 6 ACH. I think Dr Inkster may have told us but I cannot be certain. I had no prior knowledge of chill beam technology.

c) Air Pressure Differentials

A I am aware that there were problems getting appropriate air balance between rooms and corridors in ward 2a. Rooms were vacated to allow for seals around windows, doors and light fittings / switches to be resealed.

d) Air pressure monitoring systems

A I am aware that gauges were placed outside of mechanically ventilated rooms. These were also present in BMT rooms in Schiehallion ward in the old RHSC.

e) Ward temperature issues;

A I was told by nursing staff that the bedrooms in ward 2a could be cold at night. I'm sure this was also an issue in Schiehallion ward in RHSC at times.

f) room ceilings, particularly in isolation rooms;

A Chill beams as above.

g) rooms seals for pressure retention;

A Some of the light fittings and switches were not sealed completely on inspection and reported back to IMTs. Estates took action to remedy this.

h) PPVL issues with rooms;

A I was told that there was concern raised about which rooms were PPVL and which were negative pressure. I was asked to work with Dr Inkster on developing an SOP which summarised all the mechanically ventilated room types in the 2 hospitals. We designed signs for each room as a visual aide memoire to inform staff in those areas. The information on the ventilation type were provided from estates. The information on which patients could use which rooms was provided by ICDs. As with all SOPs, this was tabled at the IPC committees for approval.

i) thermal wheels

A None

j) Chilled beams, usage in rooms designed for immunocompromised patients and leakage.

A I was asked to visit a ward with Dr Inkster to look at the chill beams. I was not aware of their function. They were dusty on top and appeared to drip condensation at times. A plan was agreed to undertake regular cleaning of these.

k) Any other particular features

A No.

26 Impacts from concerns with the ventilation system:

a) Do you consider there to have been a risk of infection from the ventilation system? If so, explain.

A I am not qualified to comment on ventilation other than what has been described in IMT minutes. I consider that where the ventilation is not installed as per the design specifications specifically for immunocompromised patients, this would be an infection risk.

b) Were there other impacts caused by the ventilation system: e.g. closure of facilities, transfer of patients, other remedial measures?

A Transfer of adult BMT from QEUH to Gartnavel and movement of paediatric patients out of Ward 2a to Ward 4b and 6a would raise concern from patients and families. At each IMT, communication with families was discussed. I understand that ventilation systems were revised in wards 4b, 6a and 2a/b. I do not know the detail of the work undertaken.

c) Do you consider that the issues with the ventilation system have been resolved, or do they still have concerns? Please give reasons for your answer.

A I cannot answer this as I have not worked in the IPCT since March 2022.

DMA CANYON Reports

27 When were you first made aware of the DMA Canyon reports? How did this come about?

A I don't recall the content of a DMA Canyon report.

a) Some witnesses (e.g., Christine Peters) have said that, had they had sight of the 2015 report at the time, they would not have allowed the hospital to open. Do you agree?

A I am not in a position to answer this.

Decant of Schiehallion Unit to Ward 6A

28 In 2018 the decision was taken to close Wards 2A and 2B and to decant the patients into wards 6A/4B. Were you involved in this decision to any extent? If so please describe your involvement.

A I was made aware of the decision and reasons.

a) Did you have any concerns about the decision? If so please elaborate.

A I was concerned that patients and families were moving out of the ward but understood the options for decanting patents was discussed and agreed at IMT for the safety of patients. This was bound to cause anxiety and raise questions. Given the technical nature of the incident this would be difficult information to process and understand. I was also concerned about staff who would have to move to a new premise and one that had not been designed for children and families. It is clear from minutes that this decision was taken after a thorough review of options.

b) In particular were you concerned about;

- the options assessment.
- suitability of the other wards (6A and 6B) for Schiehallion patients; and
- steps taken to prepare these wards to receive Schiehallion patients.

A An options appraisal had been undertaken jointly between management, clinicians, estates and the IPCT. I respected the decision taken as the best option at that time to safeguard children and their care.

c) What impact(s) did closure of 2A/B and the move to 6A/4B have upon 1) patients and 2) staff?

A I remember staff telling me that Ward 6a was bigger and had a better layout than ward 2a/b. With JRe and JR, I met with 1 family whose child did not have an infection linked to the environment . This family expressed their concern for other patients and families.

Short-term Decant from 6A

29 In 2019 as a result of a series of infections, patients were decanted from 6A. Were you involved in this decision to any extent? If so please describe your involvement.

A I attended some of the IMTs and was asked by my line manager to go to CDU to undertake a visual inspection of the unit which I did with the Senior Charge Nurse prior to patients being transferred. Susie Dodd and her team had already undertaken several visits to the unit and identified work to be undertaken as described in the minutes of the IMTs. I don't remember anything else of note.

a) Did you have any concerns about the decision? If so please elaborate.

A The IMT took the decision to decant low risk patients from Ward 6a to CDU until remedial works could be undertaken. This decision was taken with input from clinical, management and IPC. I did not have concerns about this decision.

b) In particular were you concerned about; teams.1 the options assessment. Suitability of the other wards (4B, 1, RHC and CDU) for Schiehallion patients and steps taken to prepare these wards to receive Schiehallion patient

A The options to move patients had been discussed at length between senior management and the clinical teams. The local IPC team, estates and facilities were involved in the risk assessment and plan to provide alternative options to be able to provide a service in the RHC. The pathways for patients had been identified and point of use filters placed on all water outlets. My understanding is that patients were risk assessed as to where they would be decanted. Ward 4b was the adult BMT and was able to provide a protective environment for children.

c) What impact(s) did the decant have upon 1) patients and 2) staff?

A I do not know what impact this had on patients or staff.

EVENTS IN 2019

30 Dr Inkster resigned in August 2019. What do you understand to be her reasons for doing so?

A I am aware that Dr Inkster resigned from her duties as lead ICD. She continued to be a Consultant microbiologist. I was not given specific reasons as to why she did this.

31 You were present at an IMT on 23 August 2019 at which Emilia Crighton was appointed as chair. Were you surprised by this? What was your opinion of her appointment? Please refer to IMT

A I was informed that Dr Inkster had stepped down from the IMT and that Dr Crighton would take her place as chair. I wasn't made aware of specific reasons for this but was told that Dr Crighton would step in. IMTs can be chaired by either ICDs or CPHMs. I did not know Dr Crighton well enough to form an opinion at the time of her appointment.

32 On 25th September 2019 there was a meeting to discuss staffing issues within ICPT. Are you aware of this meeting? If so, what was the outcome? Please refer to Minutes of meeting A41745856

A Minutes not provided. I do not recall a meeting to discuss staffing.

a) At this meeting the view was expressed by several witnesses that IC team was "IN Extremis" chronically under resourced and being undermined

A Minutes not provided. I do not recall a time when the whole IC team was in extremis.

b) To what extent do you agree with the sentiments being expressed?

A I do not recall the aforementioned meeting. However I can comment with respect to the IPC nursing service and do not remember a time where the nursing team would ever be described as 'IN Extremis'. We had 5 nursing teams across NHS GGC and staff would move to support each other where a team may have been short staffed on any particular day.

Interactions with the Independent Review, Oversight Board, Case Note Review

33 Can you describe any involvement you had with the Independent Review

A I was interviewed by Andrew Frazer and Brian Montgomery.

a) The Oversight Board

A I attended two meetings of the OB that I recall. I attended to provide information on the standard infection control precautions audit programme in NHS GGC. I don't recall details of any others.

b) The Case Note Review

A I was interviewed along with other lead IPCNs by Lesley Shepherd and Francis Lafferty. I was asked to describe the IPC audit programme and SOPs . I was also invited to demonstrate our IPC audit process and IPC web site to one of the audit review team. Sorry I cannot remember her name.

34 What recommendations for improvement came out of these reviews?

A The recommendations from each report are :

Independent Review

The Academy of Medical Royal Colleges and Faculties in Scotland and the UK, the Royal College of Nursing, together with the Royal Academy of Engineering, The Royal Incorporation of Architects in Scotland, Architecture and Design Scotland and those with interests in the environmental sciences were asked to examine ways to engender a community of practice and scholarship that enhances collaborative work in improving the healthcare built environment. The National Centre for Reducing Risk in the Healthcare Built Environment should facilitate this initiative with its UK counterparts.

The National Centre for Reducing Risk in the Healthcare Built Environment and local NHS Boards should encourage linkages, facilitate robust networks that are cross-disciplinary, build on experience and form part of career and professional development, anticipate the need for expertise in areas where construction projects and novel interventions are in the planning stages.

The National Centre and participants should recognise that lessons are often held in organisations at a distance from host institutions by the very nature of unusual occurrences and occasional projects, and that they should create a ‘safe space’ where experience that is reputationally sensitive can flow more freely.

Oversight board recommendations : as listed in this report.

Queen Elizabeth University Hospital/ NHS Greater Glasgow and Clyde Oversight Board: final report - gov.scot (www.gov.scot)

Case note review:

1. Overall Management of Gram-negative environmental infection in Paediatric Haematology Oncology

1.1 Every GNE bacteraemia occurring in a Paediatric Haematology Oncology patient at NHS GGC should be comprehensively investigated using RCA methodology, whether or not it is considered at the outset to be related to the hospital environment or thought to be part of a potential outbreak. This will ensure that future consideration of the underlying issues can be informed by consistent, comprehensive and prospectively collected data.

1.2 A multi-professional group, with a defined and consistent membership representing all appropriate skills and backgrounds, should be established with responsibility for continuing oversight of these data: for assessment of its quality, and completeness, and for its analysis and reporting. The intent is that this group, which should have external representation, will grow in collective expertise and knowledge; have a shared understanding of the history and challenges encountered since the opening of the new QEUH/RHC site; and will be able to define and guide the organisation’s response to future concerns about environmentally acquired infection in this group of patients. The group should report directly to the IPC Manager and Lead Infection Control Doctor and its findings form a standard part of upward reporting of IPC issues within NHS GGC.

2. Demographic profile of patients

Given the unexplained but significant excess of female patients in the Case Note Review, the Paediatric Haematology Oncology service should audit all bacteraemias for a sufficient period either to reassure that there is no real gender effect, or to investigate further if this proves to be the case.

3. Environmental surveillance

3.1 The data systems used to document facilities maintenance activity in clinical areas need to consistently capture the exact location of the work done; the date(s) on which the work was actually done; and be accessible to inform the IPC process, including the investigation of clusters and outbreaks.

3.2 The frequency with which facilities maintenance activities occur in specific ward areas should be reported on a regular basis in a way that informs wider awareness of the vulnerability of the environment and tracks changes in the pattern of such activity.

3.3. The precise location of any swab or water sample taken for microbiological surveillance, and the date on which it was obtained, must be recorded and the results made accessible to inform the IPC process, including the investigation of clusters and outbreaks.

3.4 When a suspected infection outbreak is being investigated, the plans agreed for environmental sampling of the relevant area must demonstrate a systematic approach appropriate to the circumstances of the investigation.

3.5 When the Chair of an IMT (or similar future structure) identifies that environmental samples are required to inform an investigation, these should be taken, reported back promptly and evidenced in the IMT minutes.

4. Water testing

4.1 A systematic, fit for purpose, routine, microbiological water sampling and testing system is required to provide assurance going forwards. How the results from such sampling/testing are recorded, accessible and used to highlight concerns should be reviewed, including to ensure that investigations of possible links between clinical isolates and water/environment sources can be informed in a timely way. In addition, investigations of possible links

between clinical isolates and water/environment sources should consider whether (short or medium/long term) changes to the routine microbiological water sampling and testing system are required.

4.2 NHS GGC should ensure that the SOP for Minimising the Risk of Pseudomonas aeruginosa infection from water explicitly states whether this also applies to high risk areas other than adult and paediatric intensive care units and neonatal units.

5. Infection Prevention Control Practice and Audits

5.1 NHS GGC should review the current approach to IPC audit: a) to ensure that the component elements are addressed individually and that the RAG rating is not determined only by an overall score; and b) to show that the governance and assurance process relating to improvement action plans can demonstrate if interventions have been effective. Quality improvement methodology should be used to drive and sustain improvement.

5.2 The current status of IPC audit should form a routine and documented component of IMT assessment.

5.3 Greater effort should be made to ensure that deficits identified by IPC audits are remedied, re-audited, linked to measures of ongoing quality improvement/compliance, and clearly documented.

5.4 Greater attention should be paid to the evidence for benefit from Enhanced Supervision by demonstrating sustained improvement in standards where this approach is introduced to a clinical area.

5.5 The validity of Hand Hygiene audits should be strengthened by ensuring the staff sample audited is sufficiently representative in terms of numbers and types of staff; and that effectiveness of the interventions are monitored to demonstrate sustained improvement.

5.6 The frequency of Hand Hygiene audits should be increased when there are concerns about infection rates potentially related to the environment

6. Infection Prevention Control Communication

NHS GGC should ensure better communication between the Microbiology and IPC teams. We recommend a forum by which sharing of information and

actions occurs in real time to support and improve quality of care to patients, maintain progress and discuss action for any potential change in a patient's condition or linked infections.

7. ICNet Alerts

NHS GGC should review the ICNet alert organism list to ensure that, at a minimum, it reflects the advice in the Scottish NIPCM and to ensure that it is further updated to reflect experience with GNE bacteraemias.

8. Infection Incident and Outbreak Policy

8.1 NHS GGC should review its Standing Operating Procedure regarding the use of the term HAI to make it clear whether this includes all Healthcare Associated Infections. This is a specific issue in the context of patients who, like those in Paediatric Haematology Oncology, frequently and repeatedly attend the hospital as outpatients, day patients and inpatients and for whom the distinction between Hospital Acquired Infection (HAI) and Healthcare Associated Infection (HCAI) is unlikely to be useful.

8.2 NHS GGC should revisit how they will monitor and, if necessary, trigger concerns about future outbreaks of Gram-negative environmental infections. Reliance on SPC charts to determine if episodes of infection caused by unusual/uncommon microorganisms are significant should be re-evaluated. The process in place for much of the Review period appears to have been insensitive to identifying clusters that should have raised earlier concerns about potential for a common/environmental source of infection.

8.3 RCA methodology should become the standard approach to the investigation of serious infections in Paediatric Haematology Oncology patients.

8.4 NHS GGC should consider the further and consistent use of the RCA process across the organisation a) to identify evidence of common themes as a cause of infection over time; and b) what can be extracted from the RCA process for organisational learning and improvement.

8.5 NHS Scotland should consider if this approach should become a recommendation in the NIPCM.

9. IMT Process

9.1 The IPC Team should ensure IMT minutes are filed with all supporting papers so that a complete record of the discussions held, evidence presented, actions agreed and the overall report concluding the process, is available and accessible in a single place.

9.2 The IMT action log should be a continuous and evolving document throughout all meetings in an IMT series. The log should be reviewed and updated at each meeting so that there is a clear record of actions agreed, responsibility held and tasks completed. The IMT should not be closed if there are actions which have not been completed.

9.3 The absence of IMT reporting at the closure of an IMT sequence is a breach of NHS GGC's own policy. This should be remedied so that practice complies with policy.

9.4 In addition to confirming that due process has been followed in line with organisational policy, IMT and other IPC reports intended for upward reporting within the organisation should more fully describe the scale and significance of the incident that has been investigated from the patient perspective.

9.5 NHS GGC should assure that the governance of the IMT process, its reporting and escalation to Board level, is clearly defined and followed; and that an audit trail of all evidence related to any suspected or actual outbreak is clearly documented and fully reported.

10. Bacterial typing data / Reference laboratory reports

10.1 NHS GGC must (continue to) develop a comprehensive and searchable database that allows details of microbiology reference laboratory reports to be compared between samples of the same bacteria obtained from different patients or environmental sites.

10.2 The system for integrating microbiology reference laboratory reports into the patient microbiology record needs to be reviewed and strengthened. Similarly, the system for ensuring that microbiology reference laboratory information is available to and used by the IMT process, including the

investigation of clusters and outbreaks, needs to be reviewed and strengthened.

11. Patient Records

11.1 NHS GGC should undertake a review of the current effectiveness of the system for collating, storing and integrating both scanned hand written records and digitally recorded records and how this achieves an accurate, accessible and chronologically accurate health record for each patient.

11.2 NHS GGC should clarify their strategy for further evolution towards fully digital records

11.3 Consideration should be given to the integration of the microbiology recommendations regarding the diagnosis and management of infections, as currently documented in the Telepath patient notepad, into the patient clinical record.

12. Patient location coding

It should not be possible to code patient activity to a clinical area in which the patient was not present: this should be addressed.

13. Adverse Events

13.1 The Paediatric Haematology Oncology service should engage with regular reporting and analysis of adverse events. Admission to PICU is an obvious way of identifying, for audit purposes, the patients most likely to have the most serious (Category I) AE.

13.2 The PTT offers a useful tool to identify and monitor trends in the occurrence of adverse events that occur during care.

13.3 NHS GGC should assure and report consistent utilisation of the Datix system and audit the validity of the classification and risk categorisation given to incidents by its staff.

14. Central Venous Line Care

14.1 The Paediatric Haematology Oncology service should review the practice of ‘challenging’ central venous lines in line with evidence for its risks and benefits.
14.2 When it is agreed that a central line should be removed for optimal management of a patient’s infection, operating theatre and anaesthetic resources must be made available to ensure its prompt removal (within 24 hours).
14.3 The Paediatric Haematology Oncology service should ensure that a decision not to remove a central venous line contrary to the advice of the microbiologists is always documented in the medical record.

15. Other aspects of Clinical Care
15.1 The Paediatric Haematology Oncology service should ensure that Morbidity and Mortality reports are not restricted to a review of patients who die. Future GNE infections should be used as a trigger for an M&M review; to assess management and outcome; and with the inclusion of an action plan to identify approaches to reduce risk and improve care.
15.2 International consensus guidelines have recently been published for use of antibiotic prophylaxis in Paediatric Haematology Oncology. These should be reviewed by both the service and by the Managed Service Network, and local and network policy and practice should be amended accordingly.
15.3 The Paediatric Haematology Oncology service should audit the use of antibiotic prophylaxis against the new policy once implemented.
15.4 The Managed Service Network and NHS GGC should review any changes to the use of shared care that have evolved as a result of the service disruption experienced in recent years and ensure the structures and processes in place adequately address patient safety and staff support across the shared care network.

a) To what extent of these improvements been implemented?

A I am not able to comment on the extent of implementation currently.

Work culture at GGC

35 What were the staffing levels like in the ICP team while you were there? Were they appropriate to manage workload?

A I can only comment on the IPCN team with confidence. NHS GGC had a robust IPC nursing service with 5 teams across 5 sectors. Each team was structured the same with a lead IPCN and senior and infection control nurses predicated on the size of the sector covered. Nursing staff were able to cross cover when required and the NC was also able to support teams with nursing duties. There was also a surveillance nursing service that supported national surveillance programmes. I do recall when all the Consultant microbiologists with IC sessions at the QEUH site resigned at the same time those sessions this did cause a gap in the service immediately. Actions were taken by the senior management team to provide cover via consultant microbiologists who had not resigned heir IPC duties and ICDs from other teams.

a) Who was responsible for providing staffing and ensuring it was maintained at sufficient levels?

A The senior management team (ICM, ANDIPC and LICD)

b) Did you or anybody else ever raise concern regarding staffing levels?

A No. I am not aware of staffing levels raised as concern.

c) If levels were insufficient, why do you think this was?

A NA

d) Can you comment on the working environment while you were there? What issues, if any, did you have?

A I did not have any issues with my working environment. I felt we had a good working relationship with estates, facilities, pharmacy and clinical teams. I felt IPC was on the agenda at relevant groups including clinical governance and health and safety. The HAIRT report was tabled at Board meetings and published on the NHS GGC web pages.

e) Did you have concerns about the management style within GGC? If so what were they?

A None.

f) What were the effects of these issues on 1) staff and 2) patients and their families?

A NA

36 Did you report any of your concerns within your department? If so, to whom, and what was the outcome?

A NA

a) In the event of concerns, were there procedures to facilitate disclosure of this either to other GGC staff or to individuals external to GGC?

A I remember awareness of the Whistle blowing policy in the Core Brief. I cannot comment on whether there were procedures that facilitated disclosure.

b) When – and how – did you become aware of these procedures?

A The Whistleblowing Policy was promoted on Staff net and core brief as described. I do not remember the date.

c) Do you consider that these procedures are encouraged within GGC?

A There was a policy and it was advertised in the Core Brief. I have no experience to be able to answer this question.

d) Were you aware of GGCs whistleblowing policy? Was this something you considered? Please explain why/ why not.

A I wasn't aware of it before I was informed that it had been invoked by members of the microbiology department. I did not consider it. I do not remember a time when I considered this an action necessary for me to take.

e) Throughout 2018 there were ongoing Whistleblowing procedures involving several Microbiologists. Were you aware of this at the time? What was your perception of it?

A I was informed by my line manager that there had been reports of whistleblowing. I was not made aware of who these staff were nor their individual reasons for doing so.

CURRENT SITUATION

37 Are you still involved in Infection Control at QEUH. If so, how are things at QEUH now as compared to the period under investigation? Are you now seeing fewer BSIs, fewer unusual infections and /or fewer samples with multiple infections?

A No. I retired in March 2022.

38 Do you have any ongoing concerns as to the safety of the QEUH? If so, what are they?

A No. I retired in March 2022

39 Do you have any other observations regarding your time at QEUH/RHC?

A No.

Declaration

I believe that the response I have given to the questions I have been asked are matter of fact in this witness statement and true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth and also understand that this statement may form part of the evidence before the Inquiry and be published on the Inquiry's website.

The witness was provided the following Scottish Hospital Inquiry documents for reference when they completed their questionnaire statement.

Appendix A

A43255563 – Scottish Hospitals Inquiry - Bundle 1 – Incident Management Team Meeting Minutes (External Version)

The witness referenced the following documents to the Scottish Hospital Inquiry that they used when they completed their questionnaire statement.

Appendix B

Queen Elizabeth University Hospital/ NHS Greater Glasgow and Clyde Oversight Board: final report - gov.scot (www.gov.scot)

Scottish Hospitals Inquiry

Witness Statement of Questions and Responses

Alison Balfour

This statement was produced by the process of sending the witness a questionnaire with an introduction followed by a series of questions and spaces for answers. The introduction, questions and answers are produced within the statement.

Personal Details

1 Please provide your name, qualifications, chronological professional history, and specialism(s) – please provide an up-to-date CV to assist with answering this question. Please include in qualifications any specialist interest/expertise/ qualifications in any area of Infection control (E.g. hospital ventilation, water Legionella control and infection control related to the built environment, and epidemiology and outbreak management)

Alison Elizabeth Balfour
UNIVERSITY OF GLASGOW 1980-1987
1985 INTERCALATED BSc MICROBIOLOGY FIRST CLASS HONOURS
1987 MB ChB
1998 MRCPath
2006 FRCPath

Professional Background

Please describe your own role in the management of infections at QEUH/RHC in the IMT structure:

2 Professional roles within the NHS

A Part time consultant microbiologist and infection control doctor (ICD) now retired. I was a secondary care consultant appraiser from 2016 until retiral in 2022.

3 Professional roles, including dates when roles occupied.

A Part time consultant microbiologist and ICD 2002-2022

4 Areas of the hospitals in which you worked.

A As consultant microbiologist: department of microbiology serving Yorkhill (2002-2015) and QEUH/RHC until retiral; As ICD: to primary care (aka Partnerships which included mental health services, learning disabilities and managed GP Practices) 2002-2018 and then from 2018 as part of the team for QEUH/RHC until retiral.

5 Roles and responsibilities within the above areas.

A As a consultant microbiologist you are part of the team involved in the diagnostic service to the QEUH, RHC and GPs, with reporting and clinical liaison to other health care professionals; As ICD to primary care (i.e. all non-acute parts of NHSGGC such as mental health and learning disabilities with no remit for QEUH/RHC) I provided an advisory service to the primary care team of infection control nurses. From 2018 (when primary care was merged into the acute sectors) I then was part of the team of ICDs in south sector NHSGGC.

6 If you had more than one role, what was the work split?

A I have always worked part time. At the time of retiral I think the split was 1.5 sessions for out of hours commitment, 2 sessions for supporting professional activities including my role as consultant appraiser, 3 sessions as duty microbiologist, 1 session for infection control. This would give a total of 7.5 sessions.

7 How many hours per week did you spend in your role at QEUH/RHC?

A 1 session is 4 hours: in total 26 hours per week including any out of hours commitment at QEUH/RHC.

8 Who did you report to? (Please provide dates.)

A There have been various Heads of Service of Microbiology over the years (Professor Craig Williams, Professor Brian Jones, Dr Mairi MacLeod, Dr

Abhijit Bal at time of retiral). There have been various Lead Infection Control Doctors (Professor Craig Williams, Dr Teresa Inkster, Professor Alistair Leanord, Dr Linda Bagrade at time of retiral). I cannot remember dates.

9 Who reported to you? (Please provide dates.)

A Nobody.

10 Describe an average working day in your role.

A As duty microbiologist, there would be a daily teams handover meeting first thing in the morning with other microbiologists to discuss any interesting cases, any issues, anything that needed follow up from overnight out of hours. Then as duty microbiologist you would deal with any clinical enquiries from hospital or GP staff, deal with technical issues from the lab, authorise results, oversee any trainees in the lab. As an ICD, I provided an advisory service (one session/4 hours per week) to the ICNs in primary care. (Infection Control Nurses)

11 Which of your colleagues did you work with most closely on a daily basis?

A Other microbiologists, including trainees in microbiology, and biomedical scientists/technical staff.

The Infection Control Team from 2015 to 2019

12 Had you had any experience with QEUH prior to this? If so please give details.

A No.

13 What were your first impressions of the IPC team when you began working there in 2015?

A I was the ICD to primary care in 2015, so my team was based at Gartnavel Hospital. My IPC team had no remit for QEUH.

14 Were you aware of any of the following issues:

a. existing tensions between staff?
b. lack of clarity around roles and decision making?
c. relationships (i.e., between ICM and ICD)?

d. issues with record keeping-?

e. culture and bullying; and

f. attitude of senior management and board to infection control issues?

A No to all the above.

Infection Control in General

15 How is infection control managed (that is, how is it monitored, investigated, reacted to and reported both internally and externally)?

A National reporting of incidents and outbreaks is to ARHAI (Antimicrobial Resistance and Healthcare Associated Infection, which is a national organisation, part of National Services Scotland); weekly reports were made internally to board executive directors, service heads, heads of nursing and medicine.
Various committees like NHSGGC clinical and care governance, IPC governance committee. This is all I remember.

16 How large was the infection control site you were working in?

A I was working in Primary care**.** Primary care describes everything that is not acute hospitals. I was ICD with the team advising on services like mental health and learning disability; there was no remit for QEUH or RHC.

17 How many colleagues were in the infection control team?

A I can't remember exactly but for primary care in addition to myself there would be a lead ICN, several other ICNs and administrative help.

18 How involved were you in the governance of the infection control team?

A I was not involved.

19 Which colleagues were in the infection control team?

A I can't remember all the names, but Kirsty Ferguson (McDaid married name) was the lead ICN in primary care.

20 What was their experience and expertise?

A Most of them had worked for some time in primary care so they had experience of mental health and learning disability.

21 How often would the team meet?

A I would try to meet with them at least once a month over at Gartnavel. Most of the interaction would be the team calling me to discuss something or to look for advice. There was also a PICSG (Partnerships Infection Control Support Group) that I attended with the ICNs, usually quarterly.

22 Were there minutes of these meetings?

A Minutes of PICSG should be available; I no longer have access to any minutes as I am retired.

23 How would issues be escalated within the infection control team?

A ICNs would escalate to the Infection Control Manager (ICM) and also to the Nurse Consultants in Infection Control (Sandra McNamee, Pamela Joannidis, Lynn Pritchard) As an ICD, I would escalate to the lead ICD.

24 What was the structure of the infection control team?

A ICN to lead ICN to ICM; ICD to lead ICD. Lead ICD would work with ICM.

25 Who did the infection control team report to?

A Senior management team (SMT) which reported to BICC I think.

26 How many hours per week were spent working with colleagues in the infection control team?

A 1 session/4 hours.

27 What, if any, infection control plans were prepared by the infection control team?

A There was an annual infection control plan prepared by the infection control team.

28 If an outbreak occurred, how would the infection control team respond to it?

A In primary care the ICN would work with the clinical team to advise on management and any further actions required.

29 What is HAI?

A Healthcare associated infection.

30 What if any distinction is there between Hospital Acquired Infection and Healthcare Associated Infection?

A Healthcare is any healthcare setting e.g. a GP practice; hospital acquired usually means infection was acquired during the process of receiving healthcare and was not present at the time of admission to hospital.

32 To what extent, if any, is infection (whether endogenous or arising from the environment) always a risk for certain sorts of patients?

A If a person has reduced immunity, they will be more vulnerable to infection.

31 To what extent is it possible to prevent infection?

A The National Infection Control Manual (available online) has a chapter on Standard Infection Control Precautions (SICPs) which describes 10 criteria that should be applied by all staff, in all care settings, at all times, for all patients. The SICPs are things such as hand hygiene, respiratory and cough hygiene, safe management of blood and body fluid spillage, safe disposal of waste. These are all important precautions to prevent infection.

32 What, if any, sorts of infection can be expected to arise no matter the level of care taken in relation to IPC/hygiene?

A It is difficult to say but patient factors such as age/ comorbidity with other diseases/ burns etc make patients more vulnerable.

33 How is infection control monitored in the QEUH/RHC?

A National surveillance programmes.

34 What infection control investigations are carried out in the QEUH/RHC?

A I was ICD to primary care until 2018. From 2018, when I was part of the infection control team for QEUH/RHC, an investigation took place when an incident arose which required investigation.

35 Would you have expected infection control to be involved in the design of the water system?

A If there was somebody from infection control who had specialist knowledge of the design of water systems, they should be involved. I do not have this specialist knowledge.

36 Who was involved from infection control in the design of the water system?

A I don't know.

37 To what extent did you have any involvement in the ventilation system design?

A None.

38 Would you have expected infection control to be involved in the design of the ventilation system?

A If there was somebody from infection control who had specialist knowledge of the design of ventilation systems, they should be involved. I do not have this specialist knowledge.

39 Who was involved from infection control in the design of the ventilation system?

A I don't know.

40 To what extent were you consulted or briefed about the specifications of the ventilation system of the hospital before it opened? Did you attend meetings or workshops run by the contractors or were you sent or shown plans or

specifications for particular wards?

A I had no involvement: I was the ICD to primary care.

41 Were you aware of Infection Control colleagues being asked to ‘sign off’ on the safety of particular wards and if so, which wards?

A I can’t remember any IPC colleagues being asked to sign off on the safety of particular wards.

42 Do you know who performed the role of providing technical advice to the architects and designers in respect of infection control?

A No.

43 How is infection control reacted to and reported internally?

A There is ICNet (a surveillance system linked to lab results) to react/report internally.

44 How is infection control reacted to and reported externally?

A Reported through BICC.

45 How many colleagues were covering infection control for the QEUH/RHC site?

A I don’t know the number; there would be a lead ICD and lead ICN plus several ICDs and ICNs for QEUH/RHC.

46 Who would the infection control team go to for expert advice?

A They could go to anybody nationally or internationally that had expert knowledge.

47 How often would expert advice be sought?

A I don’t know.

48 What relationships did the infection control team have with other teams (e.g. domestic team)?

A I don’t know; as ICD to primary care I had no issue with any other teams I had to work with.

49 How were these relationships?

A There no issues that I can remember for primary care.

50 How often would teams communicate?

A As required, for example, the domestic team would attend the Partnership Infection Control Support Group that I also attended (quarterly) but if there was an issue on a mental health ward, for example, an outbreak of norovirus, the ICN would be liaising daily to ensure the domestic team knew what was required for any increased cleaning requirements.

The water system

51 What concerns, if any, did you have about the water supply?

A My infection control remit was to Primary Care i.e. all non-acute service (i.e. not QEUH/RHC).

52 Do you consider there to have been a risk of infection from the water supply? If so, explain.

A My infection control remit until 2018 was to primary care and I wasn't involved in infection control for QEUH/RHC in 2015.

53 Are you aware of remedial measures being taken: e.g. room closure and cleaning; ward closure; investigative and remedial works? What were these and when were they taken?

A There would have been measures such as room closure and cleaning, ward closure, but I can't remember when or where, as I was not directly involved.

54 What is your understanding of whether any issues with the water system (including drainage) have been resolved? Are you satisfied with this or do you still have concerns?

A I don't know if any issues with the water system (including drainage) have been resolved because I am now retired and have no involvement.

55 What were the impacts on staff and on patients overall?

A I was not involved and cannot remember any specifics but think any issues would be a worry and stress for staff and patients overall.

56 When were you first made aware of the DMA Canyon reports? How did this come about?

A I wasn't aware of the DMA Canyon reports until I read about them, perhaps that would have been in the Montgomery/Fraser report or in the case note review.

57 Some witnesses (e.g., Christine Peters) have said that, had they had sight of the 2015 report at the time, they would not have allowed the hospital to open. Do you agree?

A I haven't seen a 2015 report; I was ICD to primary care, which is nothing to do with the hospital

The Water supply in General [ICD/ICN/IPC]

58 What were the functions of the Water Safety Group?

A I don't know; I wasn't part of the Water Safety Group

The ventilation system in general

59 What concerns, if any, did you have about the ventilation system?

A I was the ICD to primary care, not QEUH/RHC

60 Do you consider there to have been a risk of infection from the ventilation system? If so, explain.

A I do not know because I was not involved.

61 What were the impacts on staff and on patients overall?

A I was not involved and can't recall any specifics but would think any issues would have been a worry and stress for staff and patients overall.

The Ventilation System for ICDs

62 To what extent, if any, were you involved in taking any air samples in the QEUH/RHC?

A The service for air sampling at QEUH/RHC was operated by a team from GRI (Glasgow Royal Infirmary). There was one time that I can remember that I personally took air samples and that was after the Cryptococcus IMT on the morning of 17 January 2019. There were two meetings that day and this was after the first meeting in the morning. I would not usually take air samples, but we had a spare air sampling machine in the lab at QEUH and after the 17 January morning IMT, Dr Teresa Inkster asked me to sample some particular wards. I can't remember which wards these were but there should be emails in the system to Dr Teresa Inkster and GRI (I can no longer access any emails as I am retired) detailing the ward areas sampled and also any communications with the laboratory at GRI which was going to analyse the samples.

(a) If so when was this?

A As per answer above, I did some air sampling after the IMT on the morning of 17 January 2019.

(b) If so which ward location was this?

A I can't remember the ward locations I sampled but it will be detailed in emails to Dr Teresa Inkster and the GRI lab that would process the samples. I am retired and cannot access any emails.

63 Were you concerned by any air samples?

A I took the air samples on the afternoon of Thursday 17th January 2019 and results would have gone to Dr Teresa Inkster who was the chair of Cryptococcal IMTs.

64 Why were you concerned by these air samples?

A It was unusual for me to take air samples, but it was as directed by the lead ICD Dr Teresa Inkster and was to get some initial sampling done before a team from GRI could get over to QEUH/RHC.

65 How confident were you in the Project Team and/or Estates Team?

A I had no interaction with them. I was ICD to primary care (non-acute services).

66 What is neutropenia?

A Low number of neutrophils in the blood.

67 What ventilation standards are required for neutropenic patients?

A A protective isolation room with HEPA filtered air input could be used to reduce exposure to airborne pathogens.

68 What guidance (SHTMs/HTMs/HBMs etc) did you understand applied to:

(a) HEPA filtration of wards

A I am now retired and think SHTM 03-01 would have been the guidance used for ventilation in healthcare facilities. This would apply to a-h below.

(b) Room air change rates

A as above

(c) Room air pressure

A As above

(d) Chilled Beam Unit

A As above

(e) Sealed bedrooms/en-suits

A As above

(f) Air-lock entrances to wards

A As above

(g) Back-up air handling units

A As above

(h) Pressure monitoring systems

A As above

Incident Management Team (IMT) (Pre-2015) [ICD/ICN/IPC]

69 What is the IMT?

A An IMT is a group that investigates and manages an incident.

70 When did you become part of the IMT?

A I was ICD to primary care pre 2015 and was not part of an IMT for QEUH/RHC.

71 In the event of an outbreak, describe what steps are taken by the IMT.

A The IMT would meet, assess, investigate, case definition, case finding, hypothesis, risk management, control measures, communication.

72 What is the purpose of the IMT meetings?

A IMT meetings are there for the members to investigate and manage an incident

73 Who was the ICD at the time (pre-2015)?

A I think Professor Craig Williams would have been lead ICD pre 2015.

74 What is the function of the ICD?

A An ICD is an infection specialist (e.g. microbiologist/virologist/infectious diseases doctor/public health consultant) who can advise and work with the IPC team.

75 Is this a full-time role?

A Not usually, most ICDs have other roles such as being a microbiologist.

76 What is the function of the ICN?

A An ICN is part of the team that investigates, manages, and monitors healthcare associated infections. Some may have specialist roles in aspects like surveillance or education.

77 Is this a full-time role?

A ICNs can be full time or part time.

78 How often would the IMT seek expert advice during an outbreak?

A An IMT can seek expert advice as required.

79 Who would the IMT seek expert advice from?

A Anybody with a specialism or expert knowledge if there is an issue that needs additional input.

80 What other teams would the IMT communicate with?

A They could communicate with other infection specialists if they think an issue could affect other health board e.g. the recent E.coli outbreak associated with salads.

81 To what extent would the makeup of the IMT differ depending on the circumstances of an outbreak?

A The IMT could have input from relevant people eg include a virologist if the incident concerns a viral outbreak.

82 How does the IMT process end?

A When an incident is declared over.

83 What steps are taken at the end of the IMT process?

A Report to ARHAI (Antimicrobial Resistance and Healthcare Associated Infection) and a hot debrief can be written. Although the hot debrief is not mandatory it is useful if lessons can be learned for other health boards.

84 How do you decide that an incident is over?

A Usually when the incident is controlled/no evidence of ongoing cases.

85 How do you assess there is no longer a significant threat to public health?

A If the incident is controlled/no evidence of ongoing cases.

86 What circumstances would merit a statement to the general public or other interested parties when an incident is over?

A I don't recall the procedure but there would usually be a representative from the Communications team at an IMT who would advise if there should be a statement to the general public or other interested parties when an incident was over.

87 What, if any documentation, is prepared as a result of the IMT process?

A There would be a summary report, a report to ARHAI, and minutes.

88 What was the escalation process for the IMT?

A The escalation process was to ARHAI (antimicrobial resistance and healthcare associated infection).

89 If so, what if any, report is prepared as a result of the IMT process?

A An incident summary would be written and a hot debrief report (hot debrief is not mandatory).

90 If so, who would prepare the report?

A The chair of the IMT with the lead ICN would prepare the report.

91 What process is used to summarise the conclusions, results, and lessons learned of each IMT?

A The summary report would summarise conclusions, results and lessons learnt. A hot debrief can be written and submitted to ARHAI to share lessons learned across Scotland.

92 What, if any, de-brief meetings take place at the end of the IMT process?

A I don't know.

93 How do you evaluate how effective the IMT has been for a specific incident?

A I don't know.

94 Who is the report shared with? How is the report communicated within the NHS?

A I think the report is probably shared with infection control clinical governance and BICC. A report could also go to service heads and heads of nursing/medicine.

95 Who is responsible for preparing any action plan based on the IMT report?

A The chair of the IMT with the lead ICN would prepare any action plan based on the IMT report.

HIIAT Process

96 What is the HIIAT?

A Healthcare infection incident assessment tool: a tool used to assess an incident.

97 Describe the HIIAT process?

A It is a scoring system with parameters like severity of illness and impact on services that the team assessing the event discuss and make a collective score for. A red, amber, or green score is generated, and each has actions/communications.

98 To what extent are Health Protection Scotland (HPS) involved when there is an outbreak?

A With the electronic outbreak reporting tool (ORT) a report goes to ARHAI. This can go on to Scottish Government (health and social care department).

99 What documentation is during and after the HIIAT process?

A There is an electronic outbreak reporting tool. The HIIAT tool guides as to what communications are required.

100 How clear and comprehensible is the HIIAT process?

A I think there have been a couple of versions of the HIIAT as it develops. I found it useful for assessing the issues I had in primary care, such as a norovirus outbreak, but for more complicated matters it maybe is too basic.

SMT Meetings (Pre-2015)

101 What is the SMT?

A senior management team.

102 Who was part of the SMT?

A ICDs/ICNs/ICM I think sometimes a public health consultant would attend.

103 How many colleagues were in the SMT?

A ICDs/ICNs/ICM, as above.

104 What were the roles and backgrounds of members of the SMT?

A As above.

105 What was the structure of the SMT?

A The chair would usually be the ICM or the lead ICD. I was the ICD to primary care and would sit with the lead ICN for primary care (Kirsty Ferguson).

106 How often would the SMT meet?

A I think SMT would meet monthly.

107 Were members of the SMT also members of the IMT?

A If there was an IMT then most likely an ICD or ICN who were part of the SMT would also be involved in an IMT.

108 To what extent, if any, were there issues with record-keeping of SMT minutes etc?

A I don’t recall if there issues with record keeping of SMT minutes.

109 What was the purpose of the SMT meetings?

A There should be a set agenda that would describe the purpose of SMT meetings.

110 What was the escalation process for the SMT?

A The SMT would report to the Board Infection Control Committee (BICC). I was not part of BICC.

111 What, if any, documentation would the SMT monitor?

A I don't recall what documentation the SMT would monitor.

112 To what extent, if any, would the SMT be involved in making policy?

A Sops (standard operation procedures) would be discussed e.g. hand hygiene policy.

113 Who did the SMT report to?

A The SMT reported to BICC.

114 Who reported to the SMT?

A Each lead ICN would give a sector report.

115 How many hours per week was spent on SMT meetings and related activities?

A I don't know. I think it was a monthly meeting.

116 What parts of the QEUH/RHC specification were considered at any meetings?

A I don't recall any parts of the QEUH/RHC specification being considered at any meetings. I am retired and cannot access any SMT minutes to check this.

117 What, if any input, did the SMT have in the specification of the QEUH/RHC before handover in January 2015?

A I don't recall the SMT having any input to the specification of the QEUH/RHC before handover in January 2015.

118 What, if any input did the SMT have in changes to the contract for the QEUH/RHC before handover in January 2015?

A I don't recall the SMT having any input into changes to the contract for the QEUH/RHC before handover in January 2015.

Particular events

This section covers particular events, including IMT meetings you participated in personally.

Resignations in 2015

119 The Inquiry understands that in July 2015, a number of Infection Control Doctors wished to resign with immediate effect and there was a meeting held to discuss this situation.

(a) Did you attend this meeting?

A I don't remember attending this meeting; I was the ICD for primary care in 2015 (i.e. this is non acute sites like mental health and learning disability).

120 Dr Teresa Inkster being asked to sign off on safety of Ward 2A rooms for transplant procedures in September 2015

Please refer to: Email chain between Dr Teresa Inkster, Jamie Redfern and others regarding Sealing of Suites in Children's Ward 2A - 9 September to 23 October 2015.

(a) What do you recall about this incident?

A I don't remember this incident.

(b) What concerns were raised in relation to Ward 2A?

A I have no recollection of the concerns**.** From the email chain I can see Dr Teresa Inkster sent an email Wed 09/09/2015@16:17 stating 'once again I am being asked to make a major decision about patient safety with no handover and no involvement in the background to all this'. I was not copied into this email, or many subsequent emails. My infection control remit in 2015 was to primary care which had nothing to do with RHC/QEUH

(c) In Dr Teresa Inkster's email to Sandra McNamee of 10 September 2015 (at page 43), she states that 'in light of the Information currently available to us, Alison, Pamela and I feel that we must err on the side of caution and cannot recommend that the unit is safe for transplant procedures.' Why did you feel that you could not recommend that the unit was safe for transplant procedures to go ahead?

A I don't recall this incident. I was the ICD to primary care in 2015. Dr Teresa Inkster must have asked myself and Pamela Joannidis (ICN) to help her review some results, practice and procedure and we found issues, but I cannot remember this incident in 2015.

(d) What was the outcome of Dr Inkster, you and Pamela Joannidis not recommending that the unit was safe for transplant procedures? What actions took place?

A I don't know; subsequent emails in the email chain were sent on 11/09/15, 14/09/15, 23/10/15, 24/10/15 and I was not copied into any of these and had no further involvement.

Provision of information regarding air sampling in August 2017

121 The Inquiry understands that in August 2017, your colleague [redacted] asked if you had knowledge to help progress Ward 2A isolation room works and in relation to air sampling.

(a) What do you recall about this incident?

A I don't recall this incident. Air sampling was a service operated by a team from Glasgow Royal Infirmary (GRI).

(b) Who was lead infection control doctor at this time?

I am not sure who it was at that time. The lead ICD has changed several times (eg Professor Craig Williams, Dr Teresa Inkster, Professor Alistair Leanord, Dr Linda Bagrade).

122 SMT meeting of 26 January 2017

Please refer to: SMT meeting minute of 26 January 2017 (to be included in SHI – Hearing Commencing 19 August 2024 - Bundle 13 – Additional Meeting Minutes).

This SMT meeting concerned various IPC matters. At page 1, it was noted that you 'contacted Paul McKnight and to ask Kate for information regarding the induction on Infection Control for new doctors starting.'

(a) What job roles were Paul McKnight and Kate in?

A I cannot now recall who Paul McKnight is. I think Kate must refer to Kate Hamilton who was a senior ICN.

(b) Did this request relate to the QEUH and RHC?

A Yes it was about new foundation doctors at QEUH/RHC starting their first job.

(c) What kind of information regarding induction for new doctors starting were you seeking?

A This is about new foundation doctors (first job after university) finding out how to access Infection Control if they needed advice.

(d) Was this induction for specialist infection control doctors or other doctors?

A This is not about ICDs; it is for first year doctors doing their first hospital jobs after graduation from university.

123 SMT meeting of 28 September 2017

Please refer to: SMT meeting minute of 28 September 2017 (to be included in SHI – Hearing Commencing 19 August 2024 - Bundle 13 – Additional Meeting Minutes).

A This SMT meeting concerned various IPC matters. At page 2, you noted that there had been '5 cases HAI CDI for GGH site for month of July. The SPC upper control line for this site is 5.8. Use of Actichlor for routine clean by

domestic staff reintroduced and will continue throughout July/August as a precautionary measure.'

(e) What GGH site were you referring to?

A GGH stands for Gartnavel General Hospital-for a short while I was helping with IPC there as well as primary care/partnerships (as per the minute). The ICN team for primary care/partnerships was based out of the Gartnavel site.

124 IMT of 17 January 2019 (Part one – AM)

Please refer to IMT meeting minute – Cryptococcus – 17 January 2019 - Part 1 AM (On Page 266 of SHI – Hearing Commencing 12 June 2023 - Bundle 1 – Incident Management Team Meeting Minutes (IMT Minutes) - Bundle 1 - Incident Management Team Meeting Minutes | Hospitals Inquiry

This IMT concerned Cryptococcus cases and air samples testing positive for Cryptococcus.

(a) What do you recall about this incident?

A I recall the meeting was held in the telemedicine cinema of RHC; there were lots of people there and Dr Teresa Inkster (lead ICD) was chair.

(b) What was your involvement?

A I think Dr Teresa Inkster asked me attend because I had a session of infection control that day. After the morning meeting I did some air sampling. This is detailed in answer 62.

(c) When and how did concerns first arise?

A I cannot read the 'General Situation Statement' on the minute as it has been redacted. From memory there had been two deaths in patients in [redacted] 2018 with Cryptococcus neoformans grown from their samples. I see from bundle 1 that there were 4 meetings prior to 17/01/2019 but I was not involved in any of them, nor in any of the 10 later meeting minutes in 2019 contained in bundle 1.

(d) What investigations were done?

A From the minute (not from memory) I can see that air sampling had been carried out in plant rooms that provide air to each of the two rooms, ward 4C and 6A, PICU RHC. Facilities were speaking to a specialist about cleaning the air ducts. Dr Inkster requested schematic of the ventilation system/air ducts for the QEUH.

(e) Was there a hypothesis?

A As per the minute (not memory): “infestation of pigeons within the plant room that supplies air to ward 4C and ward 6A QEUH. Aerosolisation of bird droppings has occurred and this has subsequently travelled down the ducts and into the wards.

Results from the plant room have also been found in the air sampling results within Ward 4C and Ward 6A. Reports from staff regarding boxes delivered to the wards which being contaminated by pigeon faeces. Contaminant within the labs has been ruled out as you would see multiple positive samples across specimens. Two different labs have handled samples.”

(f) If so, was it borne out?

A I don’t know. This was the only IMT I attended.

(g) Were any interventions recommended? If so were they sufficient?

A As per the minute: HEPA filter units to be delivered into Ward 4C and that patients would be put on prophylaxis. There is an action list of 10 actions with allocated responsibility at the end of the minute.

(h) How common is it in your view to have this type of issue within the hospital environment, specifically Cryptococcus being found in air samples?

A I don’t know; my infection control remit until 2018 was primary care (i.e. non acute sites). I don’t know how often Cryptococcus is found in air samples from a hospital environment.

(i) From your experience, was this something that from a microbiological point of view concerned you? If so, why?

A Finding evidence of pigeon infestation in a plant room is unsatisfactory as it may indicate pigeon soiling which can contaminate plant systems. Evidence of pigeon faeces on boxes being delivered to clinical areas is also unsatisfactory as items delivered to clinical areas should be clean and not soiled.

(j) Did you also attend and participate in Part two - the PM (afternoon) IMT meeting session on 17 January 2019, as noted in the minutes for that session? **Please refer to: IMT meeting minute – Cryptococcus – 17 January 2019 - Part 2 PM (On Page 270 of SHI – Hearing Commencing 12 June 2023 - Bundle 1 – Incident Management Team Meeting Minutes (IMT Minutes) -** Bundle 1 - Incident Management Team Meeting Minutes | Hospitals Inquiry

A No I did not attend and participate; on the afternoon of 17 January 2019 I performed some air sampling, as directed by Dr Teresa Inkster and previously detailed in section H of the questionnaire. That is why I know I did not attend.

125 SBAR of 26 August 2019

Please refer to: SBAR - Ward 6A environment dated 26 August 2019 (to be included in SHI – Hearing Commencing 19 August 2024 - Bundle 13 – Additional Meeting Minutes).

This SBAR (Situation Background Assessment Report) concerned the environment in Ward 6A in August 2019 and you are a signatory.

(a) What do you recall about this SBAR?

A This SBAR is dated 26/8/19. This was a Monday, and I would not have been at work. I have always worked part time as a consultant and would not be at work on a Monday or a Tuesday.

(b) What was your involvement?

A From memory, I was not personally involved in the report but Dr Teresa

Inkster had discussed her concerns with all the microbiology consultant team at one

of our morning handover meetings (I don't know which date) and we shared her concerns about the environment on Ward 6A, I would have then agreed to be signatory to the SBAR to confirm I had concerns.

(c) When and how did concerns first arise?

A Taking information from the SBAR and not from memory, there had been a PAG on 3rd June 2019 to discuss 4 cases of gram negative bacteraemia. This must have been when concerns first arose,

(d) What type of environmental risks were noted to exist?

A Taking information from the SBAR and not from memory, the types of environmental risks noted were issues such as poor air changes, chilled beam technology, HEPA filtration,

(e) Why did these cause a risk to patients?

A Taking information from the SBAR and not from memory, the patients had been moved from ward 2A to 6A. Ward 2A was the paediatric haematology oncology ward with immune compromised patients. Immune compromised patients are more vulnerable to infection,

(f) What recommendations were made?

A Taking information from the SBAR and not from memory: 1. Reassessment of options appraisal 2. Consider 6A to have unacceptable level of infection risk for immune compromised patients 3. External peer review by Great Ormond Street,

(g) What actions or control measures were taken in response to the SBAR and were they sufficient?

A I can't remember,

126 **IMT of 13 September 2019**

Please refer to: IMT meeting minute - Gram Negative Blood Ward 6A – 13 September 2019 (On Page 360 of SHI – Hearing Commencing 12 June

2023 - Bundle 1 – Incident Management Team Meeting Minutes (IMT

Minutes) - Bundle 1 - Incident Management Team Meeting Minutes | Hospitals Inquiry

This IMT concerned cases of gram-negative bacteria, chilled beams and the microbiological safety of Ward 6A.

What do you recall about this incident?

A I don't recall this incident; I see from the minute I was only present for the first hour of this IMT meeting and think the incident may have been discussed after I left.

127 **Resignation in 2019**

The Inquiry understands that in 2019, you resigned from your post.

(a) When did you resign?

A I can't remember exactly, maybe in September 2019

(b) Who did you provide your resignation to?

A Probably Professor Brian Jones or Professor Alistair Leanord.

(c) Why did you resign?

A I can no longer access any emails/notes as I am retired, but it may have been because the lead ICD (Dr Teresa Inkster) had resigned and there was no deputy. I have always worked part time and there would have been too much work for too few people. I think it was only myself and Dr Pepi Valyraki left as ICDs. I remember we had a meeting with Professor Alistair Leanord and agreed that myself with Dr Valyraki would continue to provide a routine ICD service but any of the specialist issues that had previously been the responsibility of the lead ICD, such as attendance at Water Safety Group meetings, would not be our responsibility (Professor Alistair Leanord became Lead ICD and assumed these responsibilities). There was also to be a review of the infection control service within 6 months, but early 2020 heralded the global pandemic with covid so I don't remember if a review happened. There

should be an email in the system about my resignation but I can no longer access any work emails.

128 **IMT of 30 April 2021**

Please refer to: IMT meeting minute – Serratia marcescens NICU – 30 April 2021 (On Page 445 of SHI – Hearing Commencing 12 June 2023 - Bundle 1 – Incident Management Team Meeting Minutes (IMT Minutes) - Bundle 1 - Incident Management Team Meeting Minutes | Hospitals Inquiry

This IMT concerned cases of Serratia marcescens in NICU (the neonatal unit of the RHC).

(a) What do you recall about this incident?

A I don't remember this incident.

(b) What was your involvement?

A From the minute I can see that I was in attendance at a Teams meeting but there are no actions or comments attributed to me.

Concerns about infection patterns

129 Do you consider that infection rates at the QEUH were unusual both in frequency and type? Do you consider that there were:

(a) more bloodstream/ patient infections than normal?

(b) more unusual **bloodstream** infections? (we take the point that water sampling/ environmental testing might show up rare organisms that are always present but never tested for)

(c) more cases of multiple bacteriaemia in one sample?

A Without access to any paperwork it is difficult to answer these questions, however there did seem to be more bloodstream infections than normal and

b) there were some unusual infections c) Idon't know without access to results if there were more cases of multiple bacteraemia in one sample.

130 Did you have any concerns, or are you aware of any concerns that patients were at increased risk of infection from exposure to pathogens via the water supply, drainage or ventilation system? If so, please describe these.

A My infection control remit was principally to primary care i.e. all the non-acute sites such as mental health or managed community services. There would have been concerns expressed by others but I can't remember the details. These could be in minutes I can no longer access.

Staffing levels in ICPT

131 What were the staffing levels like in the IPC team while you were there? Were the levels appropriate to manage workload?

A When I was the ICD to primary care until 2018 I was the only ICD for this area and levels were appropriate. When primary care merged with acute sectors and I joined the team for south sector I don't remember levels being inappropriate. For ICNs, I can't answer.

132 Who was responsible for providing staffing and or ensuring staffing was maintained at sufficient levels?

A Lead ICD and ICM.

133 Did you or anybody else ever raise concern regarding staffing levels?

A I was concerned about staffing levels when I resigned because there was no deputy for the lead ICD and the specialist areas like the water safety group that they covered. Professor Alistair Leanord then took on the role of lead ICD. I don't remember anybody else raising concerns regarding staffing levels.

134 If levels were insufficient, why do you think this was?

A It is a challenging role and not everybody wants to do it.

135 Can you comment on the working environment while you were there? What issues, if any, did you have?

A I had no issues.

136 You stood down (resigned) from the ICPT in 2019. To what extent is this attributable to any of the issues discussed above?

A As above, the lead had resigned and there was no deputy.

CURRENT SITUATION

137 Are you still involved in Infection Control at the QEUH?

A No: I retired in 2022.

138 Have you read the Overall Report of the Case Note Review and noted its recommendations?

A Yes.

139 Have you read the Interim Report and/or Final Report of the Oversight Board and noted its local recommendations in respect of Infection Prevention and Control?

A Yes.

140 Are you aware of what steps have been taken by GGC to implement each of separate recommendations of the Case Note Review, when they were taken and to what extent does the witness considers the implementation to have been effective?

A I am not aware.

141 Are you aware of what steps have been taken by GGC to implement each of separate recommendations of the 'Local Recommendations' of the Oversight Board and when they were taken and to what extent do you consider the implementation to have been effective? Please refer to any documentation that confirms your position.

A I am not aware.

Declaration

142 I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

143 The witness was provided the following Scottish Hospital Inquiry documents for reference when they completed their questionnaire statement. (Appendix A)

Appendix A

A48800307 - Email chain between Dr Teresa Inkster, Jamie Redfern and others regarding Sealing of Suites in Children's Ward 2A – 9 September to 23 October 2015

A47648658 - Item 2 – SMT Minutes 26.01.17

A47648655 - Item 2 – SMT Minutes 28.09.17

A43255563 - Scottish Hospitals Inquiry - Hearing Commencing 12 June 2023 - Bundle 1- Incident Management Team Meetings Minutes (IMT Minutes)(External Bundle)

A41893682 - SBAR - Ward 6A environment dated 26 August 2019

Scottish Hospitals Inquiry
Witness Statement of Questions and Responses
Allyson Barclay

This statement was produced by the process of sending the witness a questionnaire with an introduction followed by a series of questions and spaces for answers. The introduction, questions and answers are produced within the statement.

Personal Details

1. Name, qualifications, chronological professional history, specialism etc – please provide an up-to-date CV to assist with answering this question.

A CV included.

Professional Background

2. Professional role(s) within the NHS.

A 1997 – 2001 PA to the Director of Pharmacy – Yorkhill NHS Trust, 2001 – 2006 PA to the Medical Director – Yorkhill NHS Trust, 2006 – 2010 PA to the Medical Director and Project Manager for New Children's Hospital Project, 2010 – 2014 PA to Project Director – Alan Seabourne, 2014 – 2018 PA to new Project Director – David Loudon as well as Mary Anne Kane, 2018 – 2019 PA to Interim Director of Property Procurement and Facilities Management and then both Mary Anne Kane and Tom Steele from his starting in October 2018 until Mary Anne Kane left the organisation when I was then PA to just Tom Steele. I was then asked to cover Gerry Cox when he started as Assistant Director around October 2018 until he retired in October 2021

3. Professional role (s) at QEUH/RHC, including dates when role(s) was occupied.

A I did not work in the QEUH/RHC and only based there for the period of commissioning.

4. Area(s) of the hospital in which you worked/work.

A I was only based in the hospital during the commissioning period for 12 weeks.

5. Role and responsibilities within the above area(s).

A I was PA to David Loudon at this time and provided some support to the Project Team tasked with the commissioning with general admin duties.

6. Who did you report to? Did the person(s) you reported to change over time? If so, how and when did it change?

A I reported to David Loudon as his PA.

7. Who selected you for your role(s)? When were you selected for your role(s)? Please describe the selection process for appointment to this/these roles?

A As noted above my positions within the Project Team evolved over time as it was necessary, there was no formal interview process but a request to fill the role that had become vacant within the team.

8. Had you worked with any of your QEUH/RHC colleagues prior your role(s) at QEUH/RHC? If so, who had you worked with before this current role? When did you work with this/these colleague(s)? What role were you in when you worked with this/these colleague(s)? How long were you colleagues in this/these previous role(s)?

A I did not work with any of the Project Team prior to starting with exception of Mr Morgan Jamieson who I was PA to in his role as Medical Director of Yorkhill NHS Trust a role I was in from around April 2001

Specific role(s) at QEUH/ RHC

9. What role, if any, did you hold within the project team for QEUH/RHC?

A I was initially employed as PA to the New Children's Hospital Project Team – Fiona Mercer (MacKay and Morgan Jamieson. When Fiona left her role Mairi MacLeod was employed as her replacement. I was then asked to cover the role of PA to the Project Director when his then PA, Shiona Frew was promoted to Project Administrator. The two Directors I worked under were Alan Seabourne and David Loudon

10. Describe how you came to be appointed to this role?

A I worked for Morgan Jamieson as his PA within Yorkhill NHS Trust and when this was dissolved, and he was moved to his new role in the project team I applied to work with him and Fiona Mercer via a formal interview process.

11. What previous working relationships, if any, did you have with those who selected you?

A I previously worked for Morgan Jamieson but had never worked for Fiona Mercer before then.

12. Describe your role and responsibilities (including day to day) at QEUH/RHC post January 2015 when the hospital was handed over from Brookfield Multiplex to NHS GGC.

A My role involved managing the Directors diary, arranging and minuting meetings, preparing presentations and drawings for meetings, arranging site visits and general admin tasks as required for the project team.

13. How did your role change following handover of the QEUH/RHC in or around January 2015?

A I was moved from the cabins on site into the hospital to support the commissioning team and the Director – the workload remained similar to previous role.

14. a) Where was your role in the hierarchy of the organisational structure at QEUH/RHC?

A I had no role in the new hospitals once the commissioning period was completed, I was moved with my Director to another location on site as his role then moved to be Director for Estates and Capital which encompasses not just this hospital site but the entire estate of NHS GGC.

b) When did the commissioning period take place? What areas of the hospital were commissioned? Who was responsible for carrying out the commissioning? Where were records kept of commissioning?

A Preparations for the hospital to come into use began almost immediately after handover from Brookfield Multiplex. I was based in the hospital in my role as PA to the Director I was not part of the commissioning team as such – there was a commissioning team who took over their specified roles in preparing the hospital. I did not have access to these records or know where these were/are stored.

c) What was your role in the commissioning process?

A (No answer provided)

d) Do you recall any concerns being raised about the water or ventilation system during the commission phase?

A I was based in the hospital in my role as PA to the Director I was not part of the commissioning team as such – there was a commissioning team who took over their specified roles in preparing the hospital – I did not have access to these records or know where these were/are stored. I am not aware of any issues raised about water or ventilation.

15. Who did you report to, (name(s) and role(s))?

A Not applicable, see above.

16. Describe your relationship with your supervisor in this role.

A Not applicable see above.

17. Please tell us who which staff reported to you, and who you were responsible for in your current role, and your relationship with them.

A Not applicable – I do not have any staff reporting to me.

18. When did you start your current role?

A My current role began once the commissioning aspect of the project was completed.

19. If applicable, how does this role differ to other roles you have held at QEUH/RHC?

A Not applicable, as I held no role in the QEUH/RHC other than admin during commissioning.

20. Refer to the Estates Team Bundle, document 29 – Organograms showing the organisational structures within QUEH.

a) Did the organogram match the organisational structures of QEUH at the time?

A For the Directorate I work for it reflects as far as I can see the higher levels of staff at that time.

b) If not, why not?

A Not applicable.

c) How did the structure and hierarchy operate across the different sectors?

A Not something I could answer.

d) Describe the organisational structure now:

A For the Directorate I work for there is significant difference with different sectors now in place and some changes to staff which have occurred over the years since this organigram was created.

21. From January 2015 onwards how was communication between you and your colleagues? What communication issues, if any, arose?

A I was not aware of any difficulties with communications.

22. How did you keep a record of work delegated?

A Staff knew what needed to be done – I was not aware of any formal process for this.

23. How was delegated work supervised?

A Staff I worked for did not have “supervised” roles but would have updated as a team where necessary when work overlapped/affected.

24. Which other QEUH teams or departments, if any, did you work closely with?

A For myself procurement in the main to ensure supplies/equipment was brought onto site at the correct time slots and distributed appropriately who then consulted with the departments directly.

25. Please describe your working relationship with these QEUH teams or departments (including areas of hospital work on).

A The teams appeared to work well together to progress through the commissioning process.

26. What concerns, if any, did you have about any member of staff? If so, please describe these concerns. What action, if any, did you take in relation to these concerns?

A I had no issues.

27. a) What concerns, if any, were ever raised about management/ managers? If so, please describe these concerns. What action, if any, did you take in relation to these concerns?

A None that I was aware of.

Pre-26th January 2015

28. a) Refer to the ZBP Ventilation Strategy Document. Were you aware of the ZBP Ventilation Strategy document dated 15 December 2009? If so, when did you first become aware of it? If you were aware of it, what did you understand it to be the relevance of this document at the time?

A. I was not aware of this document.

b) When did you first learn of the Agreed Ventilation Derogation i.e. that 2.5 ACH was the agreed rate? When you became aware, to which wards did you understand this to apply to?

A. I am unable to answer this question as I do not recall this document.

c) Do you recall discussions regarding the Agreed Ventilation Derogation? If so, what was the nature of these discussions?

A. I have no recollection of this.

Documents, Paperwork and Processes in Place as at 26th January 2015

We know that handover of QEUH occurred on 26th January 2015:

29. When did you move to the QEUH/RHC site?

A Within days of the handover although I cannot remember the exact date of move as we were to start the commissioning process.

30. If applicable, where did you work from prior to being based on the QEUH/RHC site?

A The Project team were based in cabins which were located where the children's park is now.

31. If applicable, how did you manage the move from the previous site to the QEUH/RHC site?

A We moved the short distance into the new building over a period of a few days taking computer equipment and what furniture we needed to conduct the commissioning leaving the majority within the cabins which was then managed by others.

32. a) Were there any issues or concerns you had during the move?

A. Nothing of note other than it felt rushed at the time.

b) In what way did it feel rushed? What, if anything, concerned you about this?

A 12 weeks does not seem like a long time for such large hospitals to be made ready for use – it was my first experience of working in that area so had no inclination of what was a reasonable time frame there just seemed to be a lot to do getting equipment in and areas ready to accept patients and new staff to be given orientation to the building which is large and fairly complex when you first start moving around it.

33. How was documentation transported? How was this documentation stored? Did any paperwork get lost in the move?

A This was not an area I was responsible for so not clear on what happened to any of that.

34. a) Were you aware of any concerns raised by colleagues regarding paperwork being in place when NHSGGC took handover of QUEH/RHC in January 2015?

b) If so, please describe these concerns; who had concerns and why? Was any action taken in response to these concerns?

A Not something I was aware of.

35. Were you aware of any issues being raised regarding the water system size at handover? If so, what were the issues and who raised them? Was any action taken?

A Not something I was aware of.

36. Were you aware of any issues being raised in respect of cleaning and maintenance regimes at handover, or following handover? If so, what were the issues, who raised? What action was taken?

A Not something I was aware of.

Isolation rooms – Schiehallion Unit

37. Were you aware of concerns regarding the isolation rooms in the Schiehallion Unit? Refer to Estates Communications Bundle document 93, 94, 95, 96, 97:

Within the documents referred to, you emailed a letter from David Loudon to Alistair Fernie at Multiplex on 1st March 2016:

a. Describe your understanding of what the concerns were at the time?

b. Who was involved and what was their involvement?

c. Your understanding of what action was taken and why?

d. Was any work carried out and if so by whom?

e. Your understanding of whether the issues were resolved and when?

f. Describe any further information you were/ are now aware of regarding these issues which may assist the Inquiry?

A I do not believe I am qualified to respond to these questions.

SBAR and Ventilation Issues

38. Refer to the Estates Communications Bundle document 104, 105:

a. Describe your understanding of the issues?

b. Who was involved?

c. What action was taken and why?

A I do not believe I am qualified to respond to these questions.

Ward 4B

39. Refer to the Estates Communications Bundle document 97:

a. What were the issues, as far as you were aware at the time in respect of Ward 4B?

b. What was the intended purpose of PM 471?

c. Who was involved?

d. What action was taken and why?

A I do not believe I am qualified to respond to these questions.

40. Refer to the Estates Communications Bundle document 123:

a. Describe your understanding of the issues?

b. Your understanding of the issues with taps?

c. Your understanding of the issues with the energy centre?

d. Your understanding of the issues with ventilation?

e. Who was involved?

f. What action was taken and why?

A I do not believe that I am qualified to respond to these questions.

Water Technical Group

41. Refer to Estates Communications Bundle document 127:

a. Describe your understanding of the issues with taps?

b. Who was involved?

c. What action was taken and why?

A I do not believe I am qualified to respond to these questions.

42. Mary Anne Kane emailed Eddie McLaughlin from NSS regarding a meeting that you were to take minutes at. Do you recall this meeting? What was discussed at this meeting? Refer to Water Technical Group Bundle page 5.

a) What was the purpose of this meeting?

b) What action was taken in response to the meeting and why?

c) Who was involved?

A After rereading the notes I can only respond to parts of the questions: a) the meeting was called as there had been issues found with the taps and increase in numbers from routine testing, b) the notes refer to the actions taken after the discussion, c) the notes state who was present for the different parts of the meeting I was only present at the meeting to take note of the discussions and actions agreed

43. The water technical group (WTG) sat between 2018 and 2019. Estates Team Bundle, page 938, refer also to the Water Technical Group bundle.

a. What is the purpose of WTG?

A From my understanding the group was formed to discuss and resolve the increase in samples returning with higher than acceptable counts.

b. What issue/ event prompted the setting up of the WTG?

A from my understanding it was formed due to the high numbers being returned from routine water samples.

c. What was your involvement with the WTG?

A I arranged the meeting dates and times and room bookings, circulated diary invitations and took notes at the meeting.

d. Who was involved in the WTG, set out their roles and responsibilities?

A There were many people involved over the time of the meetings – the meeting notes clarify who attended these meetings.

e. Describe any signification issue managed by the WTG, describe actions taken and reasons why actions were taken?

A From my understanding the installation of CLO2 to the new hospital buildings to alleviate the issues found, investigate the taps and water temperatures.

f. Why wards were the focus of the WTG? And why?

A As I understand it there were specific wards that housed suspectable patient groups.

g. Do you understand why chlorine dioxide dosing was introduced?

A In addition to the filters at point of entry to the site this would be an added measure to kill any bacteria getting through these and provide this all over the hospital to every tap/outlet.

h. Why was bottled water being used? Which wards were affected?

A I do not believe I can answer this question but assume it would be to lessen risk to vulnerable patients until issue resolved.

Ward 6A

44. Refer to Estates Communications Bundle document 141:

a. What was your understanding of the issues with patients from ward 2A being in occupation of Ward 6A?

b. Why was there an SBAR?

c. Who was involved?

d. Knowledge of action taken and why?

A I do not believe I am qualitied to answer this question.

DMA Canyon Reports

Refer to Bundle 6 – Miscellaneous documents – documents 29 and 30.

45. Refer first to document 29?

46. Who ordered this?

A The document states Ian Powrie requested it.

47. Who signed off on payment?

A I have no knowledge of how this was signed off.

48. How was this signed off or payment processed?

A I have no knowledge of how this was signed off.

49. Who was the report sent to?

A The document states it was sent to Ian Powrie and Jim Guthrie.

50. a) When did you first become aware of the DMA Cayon 2015 report?

A I was aware of the document during a meeting where I was taking notes thought cannot remember what meeting this would have been.

b) What was discussed at this meeting? What concerns, if any, were raised and by whom?

A As noted previously I remember hearing the DMA Canyon 2015 report but cannot remember in what context this was.

51. Where would the report have been stored?

A I have no knowledge of where it would have been stored.

52. Who had the report?

A From the report itself Ian Powrie and Jim Guthrie and cannot state if any others had sight of it.

53. When were DMA Canyon present at QEUH/RHC site between 2015 and 2018?

A I have no knowledge of this.

54. What, if anything, did DMA Canyon say about the report during their time on site between 2015 and 2018? If so, when and what was mentioned?

A I have no knowledge of this.

55. DMA Canyon prepared another report in 2017 (Bundle 6 – Miscellaneous documents, document 30). What works, if any, recommended in the 2015 were carried out prior to the 2017 report?

A I have no knowledge of this.

56. a) Do you recall anything specific happening following the 2017 report? Were any concerns raised or issues flagged that you were aware of? If so, please provide details of the concerns and who was involved, and any action take

A I have no knowledge of this.

b) What is your understanding, if any, of the reporting routes for legionella reports such as the DMA Canyon 2015 report? i.e. who should the report have been escalated to on receipt, what, if any, reporting lines were in place at 2015 for dealing with such matters?

A At that time I had no knowledge of reporting routes for such matters as they were not something I had any involvement with.

Review of Issues Relating to Hospital Water Systems Risk Assessment 26th September 2018

57. Refer to Estates Team Bundle, document 134.

a. Understanding of why the review was ordered?

b. Why ordered it?

c. Who was involved?

d. Knowledge of action taken in response to the review and why?

A I have not seen this document and can only assume it was requested due to the issues being seen on site but cannot say who prepared it or requested it.

General

58. You often took minutes, for example in the Water Technical Group meetings.

Was there ever a time when you were asked not to take minutes. If so, when, by who and why?

A. Not that I am aware of if I was asked to be present then notes were taken.

Staffing and Working Environment

59. a) Describe the handover process between Alan Seabourne and David Loudon; how long did handover last, how were matters handed over (meetings, emails etc), how long were Alan Seabourne and David Loudon working together to manage the handover process, were any concerns expressed by either party during handover?

A I was on leave when David Loudon started for his first two weeks in June - from memory they had meetings to discuss various aspects, none of which I

was party to. David took park in regular meetings from his start along with Alan Seabourne and Alan left a hand over folder of some key matters. I cannot remember how long they worked alongside each other and was not aware of any concerns raised.

b) Likewise, describe the handover process between David Loudon and Mary Anne Kane, and then Mary Anne, Kane and Tom Steele.

A I cannot be entirely certain of the process it was some time ago. The usual process would be a series of handover discussions over a period of a few days or weeks prior to person leaving at that level.

60. What were the staffing levels like in estates at the point of handover? Where did the staff come from – were they mainly transferred from old site?

A I have no knowledge of the staffing levels within Estates at the time of handover or where the staff were transferred from.

61. Concerns if any about staffing following handover – to what extent did the staffing levels manage the workload? Refer to Bundle 8, document 40.

A I have no knowledge of this.

62. Was appropriate training in place for new and existing staff on using new systems and working within the QEUH? Do you recall manging or handling any traising records? What training was in place, that you were aware of?

A I have no knowledge of this.

63. Who was responsible for providing staffing? Who was responsible for ensuring staffing was maintained at sufficient levels?

A I have no knowledge of this.

64. What concerns did you have regarding staffing levels?

A None.

65. What was the working environment like when QEUH opened – work life balance/ workplace culture? What issues, if any, did you have? If so, what concerns did you raise? Who did you raise these concerns with?

A I was only in the building during commissioning and did not have any concerns.

66. How was information shared between the estates and project team and infection control staff and microbiologists? Were you aware of any issues with information sharing? If so, please describe the issues and members of staff involved?

A I have no knowledge of this.

67. Were you ever asked not to provide information to infection control staff? If so, what information, when did this happen and who was involved?

A No.

68. Generally, discuss the workplace environment and culture. What concerns, if any, did you have?

A. I did not have any concerns and did not experience any issues at the time.

68. Is there anything further that you want to add that you feel could be of assistance to the Inquiry?

A. I have nothing further to add.

Water Obligations

69. a) In respect of water obligations at the point of handover, who was the Duty Holder? Who appointed the Duty Holder? What was the role of the Duty Holder?

A At that time I was not aware of there being a duty holder or that a role of that need existed – I have since learned of this as I worked in the E&F Directorate.

b) Question for Witness: In respect of water obligations at the point of handover, who was the Designated Person? Who appointed the Designated Person? What was the role of the Designated Person?

A. Answer as above.

c) In respect of water obligations at the point of handover, who was the Duty Holding Principal Engineer? Who appointed the Duty Holder Principal Engineer? What was the role of the Duty Holder Principal Engineer?

A. Answer as above.

d) Specifically in respect of legionella, who were the Duty Holders? Who appointed the Duty Holders? What was the role of the Duty Holders?

A. Answer as above.

e) Describe any other appointments in respect of water or any other health and safety responsibilities in respect of water, describing your understanding of the role and who filled them?

A. Answer as above.

f) Describe the management structure within these reporting lines in respect of the above appointments?

A. Answer as above.

g) Question for Witness: What records were kept in respect of these appointments?

A. Answer as above.

h) Question for Witness: What appointments were held within the Ventilation Safety Group, who held the appointments, what were the roles/ obligations of

each appointment, and what were the reporting lines within the Ventilation Safety Group?

A. Similar to my previous response, I was not aware of the role or who held this role and therefore cannot respond to the question on reporting lines for the Ventilation Safety Group.

Declaration

I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

The witness was provided the following Scottish Hospital Inquiry documents for reference when they completed their questionnaire statement.

Appendix A

A43293438 – Bundle 6 – Miscellaneous Documents
A43955371 – Bundle 8 – Supplementary Documents
A47395429 – Bundle 10 – Water Technical Group/Water Review Group Meetings
A47069198 – Bundle 12 – Estates Communications
A32993814 – Email C&B to K Connelly – Ward Ventilation

Scottish Hospitals Inquiry

Witness Statement of Questions and Responses

Clare Mitchell

This statement was produced by the process of sending the witness a questionnaire with an introduction followed by a series of questions and spaces for answers. The introduction, questions and answers are produced within the statement.

Professional History

1 Please list your professional qualifications, with dates

A Registered General Nurse, South West College of Nursing and Midwifery Glasgow 1977 – 1980. Diploma in Infection Control, Glasgow University, 1994BSc in Nursing, Glasgow Caledonian University, 1996. MSc in Infection Prevention & Control. University of Highlands and Islands, 2011

2 Please give your chronological professional history- all roles held where and when. If you have one, please also provide an up-to-date CV.

A Registered General Nurse (RGN) Nurse Training, Southern General Hospital, Glasgow, 1977-1980.
Staff Nurse Poole General Hospital, Poole Dorset, 1980-1981.
Staff Nurse medical ward, Royal North Shore, Sydney, Australia 1981-1982.
Staff nurse Victoria Infirmary, Glasgow, 1982-1990.
Staff Nurse ITU, Hairmyres Hospital, East Kilbride, 1990-1993
Infection Control Nurse, Hairmyres Hospital, NHS Lanarkshire, 1993-2000.
Senior Infection Prevention and Control Nurse, South Glasgow, NHS Greater Glasgow & Clyde, (GGC) 2007-2010.
Lead Infection Prevention & Control Nurse, South Glasgow, GGC, 2010-2015
Senior Infection Prevention & Control Nurse, NHS Lanarkshire, 2015-2020.
Infection Prevention & Control Nurse (IPCN), Care Home Support Team, NHS Lanarkshire, 2020-2024.
Retired March 2024.

3 What specialist interest / expertise / qualifications in any area of Infection Control do you hold? E.g., hospital ventilation, water Legionella control and infection control related to the built environment, and epidemiology and outbreak management.

A No specialist interest areas held. I carried out the full range of IPCN activities in line with my job description (s). Role summarised below.

4 Please explain your role within Infection Control at QEUH/ RHC. Who did you report to, and who reported to you, if anyone?

A My role was to lead the team of IPCNs to meet the requirements of the NHS GGC, Healthcare Associated Infection (HAI) programme of work for the south sector of GGC, this involved:

- Surveillance of alert microorganisms, compiling the number of patients with HAI e.g. *Clostrioides difficile* (CDI), MRSA, ESBL, CPE etc. Identifying trends/increasing numbers and populating the electronic reporting system (ICnet) and the Statistics Process Control charts (SPCs). IPCT team follow up on alert organisms reported via ICnet and a member of the team would visit the ward/phoned the ward to provide advice and information on isolation precautions/ decontamination and record results and advice provided on the electronic notes.
- Fulfilling a programme of audit activities e.g. hand hygiene, environmental audits, MRSA. The environmental audits were carried out within the wards and departments by 1 or 2 members of the IPCT. Results were fed back to ward/dept by means of an electronic report.
- Carry out a programme of education for all disciplines of staff which could involve formal and informal sessions.
- Attend the GGC IPC groups including the weekly Lead nurse meetings, policy group, education group and other groups/meetings as required.
- Attend the south Facilities meetings with domestic and Estates personnel. Water meetings were attended by Microbiologists and sometimes attended by Lead/IPCNs.
- Organising and holding a weekly team meeting to provide feed-back from the Lead nurse meeting, discuss hot spots staff issues, future plans etc.

- Responsible for recruitment and selection for the South IPCT.

I reported to the Associate Director of Nursing, Sandra McNamee
I led a team of IPC staff which included eight IPCNs, 1 surveillance nurse and two administrative assistants**.**

Involvement in the specification of the new hospital prior to January 2015

5 Were you involve to any extent with the specification, design or construction process before January 2015? If so, were you asked to sign off any aspect of the process?

A No

Infection Control in General

6 How are HAIs in QEUH/RHC is monitored, investigated, reacted to and reported both internally and externally?

A At the time of working within GGC until I left in October 2015 HAIs were monitored, investigated, reacted to and reported as outlined in the policies at that time. In summary and as far as I can remember the HAIs were reported to the IPCNs either electronically via ICnet or via a phone conversation from the Consultant microbiologist/IPCD. This system reported HAI's throughout the day and were acted upon promptly by the IPCNs who would communicate to the ward/department by means of a visit or where appropriate a phone call. An investigation of the source of infection would take place depending on the infection. Epidemiology of certain infections where there was a potential for cross infection, would be investigated to determine if it was part of a cluster of cases within a period of time etc. Discussion with the IPCD/ ADNS would take place if there was a suspicion of an increased incidence. Epidemiology of cases of HAI would be collated by IPC surveillance team. HAIs were reported to PH Scotland (previously HPS, as per policy). National figures were collated for *Clostrioides difficile* and some of the multi drug resistant microorganisms by PH Scotland.

7 What were your first impressions of the hospital when it opened in 2015? Did you have any immediate concerns from an infection control perspective?

A My first impressions of the hospital was the sheer size and volume of work for the IPC team. The team were busy assisting the ward managers/Lead nurses to settle in, providing posters, information as required. There were teething problems in certain areas with the level of domestic cover and level of hygiene. Myself and the team were asked to support staff at meetings to discuss hygiene levels. I was aware of the significant increase in work for the domestic team. The domestic management appeared to be proactive in addressing domestic cover etc.

8 The Inquiry understands that there were some complaints about dirty beds shortly after the hospital opened. Can you describe this incident?

A The ward managers brought this issue to the attention of the IPCNs and provided photographs of contaminated beds. I contacted the commissioning team who at that time did not see a problem with the beds. I escalated the issue to my line manager and sent photographs of the contaminated beds. I was subsequently advised by my line manager, Sandra McNamee, not to pursue this issue. However my line manager did ensure that action was taken to resolve this issue.

9 How was the incident resolved?

A I was informed that a checklist was compiled and that each mattress and bed leaving the old hospitals for the new hospital was checked for cleanliness. My understanding was the checklist recorded that the bed and mattress were clean before being moved. The issue resolved as the ward managers did not report any further contaminated beds/mattresses.

Ventilation

10 Soon after the hospital opened an issue arose as to whether ventilation in the Adult BMT Unit was adequate. What is your understanding of the situation?

A I cannot remember. This unit did not move into the new hospital from Gartnavel until weeks after the other adult wards moved. I remember they moved back out after just a few weeks. I cannot recollect the specific problems but I knew the ventilation system was under question.

a) What was the potential patient impact of the absence of HEPA filters?

A I was unaware of this situation at the time. However if the rooms did not have HEPA filters then the air quality would not be as expected.

For immunocompromised patients they would not have the benefit of the cleaner air provided by a HEPA filter and may be exposed to the risk of airborne infection.

b) What was done to resolve any HEPA filter issues?

A I cannot recollect. There would have been actions agreed at the HAI Scribe meeting.

c) Should HEPA filters have been installed at handover?

A If the building notes for this specific unit required HEPA filters then they should have been installed during the build and prior to hand over.

d) Who do you consider was responsible for providing HEPA filters and ensuring that they were installed during the build?

A The builders who should be following the building notes

e) Who signed off handover without HEPA filters being installed?

A I do not know

f) Were infection control doctors and nurses consulted? If so, who, and at what stage?

A I cannot recollect.

g) Are you aware of HEPA filters being missing from any other wards following handover?

A No

11 HAI scribe- refer to email from Peter Moir dated July 2015

A You were asked to produce an HAI Scribe.

a) Can you explain the purpose of an HAI Scribe?

A An HAI Scribe is completed for various reasons e.g. prior to commencing a new build, prior to a refurbishment project or prior to routine work being carried out e.g. filter change, theatre vent cleaning etc. An outline of the work being carried out is discussed and a comprehensive, standardised checklist is completed. The discussion and checklist assist with assessing the risk of infection to patients and staff as a result of the work and the document should outline the measures which should be put in place to reduce that risk. This completed document is then signed off by all parties involved in the process. There is a suite of documents outlining the HAI Scribe process and guidance on the correct document to choose for the task e.g. new build, refurbishment, filter change, etc.

b) Whose responsibility is it do to an HAI Scribe? Is it one person or is it a collaborative process?

A An HAI Scribe is a collaborative approach involving a range of key personnel. These should include the Facilities staff, contractors, IPC staff - IPCN/IPCD, clinical staff (for clinical areas), other staff as indicated by the work being undertaken e.g. builders, specialist ventilation/water personnel, architects etc.

c) What was your contribution, if any, to this one?

A I cannot remember if I attended this HAI Scribe meeting. As this was the newly opened hospital this may have been the ADNS, Sandra McNamee, Consultant Microbiologist, Craig Williams or Pamela Joannidis (nurse consultant) who would have attended. If I attended my name would be recorded on the attendance sheet and sign off for the HAI Scribe document.

d) What was the outcome of the process?

A I cannot remember but the actions, dates and responsible persons for those actions would be recorded on the HAI Scribe document.

12 Other than the issue of HEPA filters, are you aware of any other issues with the ventilation system? Are you aware of issues with:

a) Air Changes Per Hour (ACH)

b) Air pressure monitoring systems

c) Ward temperature issues

d) Room ceilings, particularly in isolation rooms

e) Room seals for pressure retention

f) PPVL issues with rooms.

g) Thermal wheels

h) The use of chilled beams 1) in general and 2) in rooms designed for immunocompromised patients.
If so, please give details.

A Not in the adult hospital. There were ventilation issues in ward 2a in the RHC. As far as I can remember there was an issue with the room seals and the air monitoring failed a number of times. Experts in ventilation were advising management on the ventilation system in this ward.

Water System

13 Were you aware of any concerns with the water system from the opening of the hospital until your resignation? If so, please give details.

A I cannot remember.

Concerns about infection

14 During your time at QEUH did you have any specific concerns about amounts, locations, clusters or types of infection within the hospital?

A No

15 Did you, or any of your colleagues, consider that patients were at increased risk of infection from exposure to pathogens via the water supply, drainage or ventilation system?

A No

The ICP Team at GGC

16 What were your impressions of the GGC infection control team in 2015. Were you aware of any of the following:

a) Existing tensions?

b) Lack of clarity around roles and decision making?

c) Relationships (i.e., between ICM and ICD)?

d) Issues with record keeping-?

e) Culture and bullying; and

f) Attitude of senior management and board to infection control issues?

A I was not aware of any records keeping, lack of clarity around roles or bullying. There was a good relationship between IPCNs and Microbiologists/IPCDs. However I was aware that there was some clashes between Microbiologists. This did not affect the work of our team of IPCNs.

Staffing levels in ICPT

17 What were the staffing levels like in ICP team while you were there? Where did the staff come from? Were they mainly transferred from old site?

A The team was a good size for the beds within the South Glasgow Team. However on first moving to the QEUH the IPCNs were very busy helping the wards to settle in and were in the wards for a large part of their shift. The geography of the QEUH including the retained buildings generated an increase in time walking between wards and buildings.
The IPCNs were already working in the south team between the Southern General Hospital/Victoria Hospitals and RHSC.

a) Were staffing levels appropriate to manage workload?

A In retrospect I feel there could have been a second Lead Nurse. After I resigned the site was covered by two Lead IPCNs one for the adult hospital and one for pediatrics and the neonatal unit.

b) Who was responsible for providing staffing? Who was responsible for ensuring was maintained- at sufficient levels?

A The ADNS, Sandra McNamee

c) Did you or anyone else raise concern regarding staffing levels? If so, to whom, and what was the outcome?

A No. However I made it clear at the weekly Lead nurse meetings how busy the team were.

18 Can you comment on the working environment at QEUH at the time you were there? What issues, if any, did you have?

A Relationships within the South IPC team was good.

a) Did you raise any of these concerns, If so, who with? What was the outcome?

A **N/A**

b) Specifically, did you have concerns about the management style within GGC? If so what were they?

A No

c) Please comment on how, in your experience, the working environment and/or management style affected the raising of concerns within the hospital. Did staff have sufficient opportunity to raise and be heard on matters which they considered to be of concern?

A I am unsure about this. However an example of a member of the clinical team raising concerns and receiving support from a member of the IPCT : I was asked to attend an ITU meeting held by the Lead nurse to address hygiene issues within the department. This meeting was also attended by the domestic supervisor/manager. The Lead nurse made it clear he wanted an improvement in service. Following a walk round and discussion on the expected hygiene level, as far as I can remember the situation did improve.

d) What were the effects of these issues on 1) staff and 2) patients and their families?

A N/A

19 If you had concerns about wrongdoing, failure or inadequacy within the hospital: were there procedures to facilitate disclosure of this either to other GGC staff or to individuals external to GGC?

A I did not have concerns about wrongdoing

a) When and how did you become aware of these procedures?

A N/A

b) Do you consider that these procedures are encouraged within GGC?

A N/A

20 You left in October 2015. While obviously there may be many reasons for this, did the culture in the ICPT contribute to your decision?

A No

21 Are you aware of any colleagues who resigned due to problems within the IC team?

A No

22 Is there anything further that you want to add that you feel could be of assistance to the Inquiry?

A No

Declaration

I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

The witness was provided the following Scottish Hospital Inquiry documents for reference when they completed their questionnaire statement.

Appendix A

A40241896 – RU QUEH – LEVEL 4 WARD B WORKS

Scottish Hospitals Inquiry

Witness Statement of Questions and Responses

Dr Jairam Sastry

This statement was produced by the process of sending the witness a questionnaire with an introduction followed by a series of questions and spaces for answers. The introduction, questions and answers are produced within the statement.

Scottish Hospitals Inquiry (SHI) considerations and guidance.

Cryptococcus - General

Refer to the Cryptococcus IMT dated 2nd July 2020 and 'Email chain – Tom Steele, Jennifer Rodgers, Angela Wallace and other NHS GGC staff – IMT Ward 6A Draft Notes of Meeting – 2 July 2020' Sub-Group Bundle, IMT Bundle and NHS GGC SBAR Bundle to assist.

1. Tell me about your understanding of Cryptococcal infections in humans?

A Cryptococcus is an invasive fungus transmitted through the inhalation of spores and causes Cryptococcosis, an infection commonly associated with immunosuppressed individuals. The fungus is usually found in soil contaminated by bird droppings and in decaying wood and in the tree hollows. It is a rare infection in humans. It can manifest as general malaise, with fever, rash, pneumonia and or meningitis.

2. How common is it to see cases of Cryptococcus in children?

A It is extremely rare in children. This was the first time that I had seen in my 28 years' experience in this field in the UK.

3. How many Cryptococcus infections are you aware of at QEUH/RHC between 2015 to date?

A Two cases - one adult and one child by cryptococcus neofamans (CN). Cryptococcus Neoformans is the species of Cryptococcus that causes infection in humans. The other type is Cryptococcus Albidus (CA), which does not cause infection in humans.

(a) You have referred to there being two cases of Cryptococcus infections that you were aware of at QEUH/RHC between 2015 to date. Does this include the Cryptococcus infection you have referred to in Section A3, particularly Q9.1? If not, why not?

A It does not include the case I have referred to in section A3, as the IMT and IPC did not identify this case as cryptococcosis infection. Their interpretation was that the lab tests were false positive.

(b) Are you aware of Cryptococcus Albidus being found in QEUH/RHC between 2015 to date? Please explain if the present of Cryptococcus Albidus increases the risk of infection in humans of Cryptococcus Neoformans. If the presence of Cryptococcus Albidus does increase the risk of infection in humans of Cryptococcus Neoformans, what action, if any, are you aware of having been taken to deal with this increased risk of infection.

A Please refer to section 5A. CA spores were identified on ward 6A in January 2019. It neither causes human infection nor increases the risk of cryptococcosis neoformans. Patients were moved out of the ward 6A temporarily and portable HEPA filters were installed on ward 6A to decrease the risk of infection

Cryptococcus 2018

4. We are aware that there were Cryptococcus infections in QEUH/RHC in 2018:

(a) What was your involvement, if any, in connection with the Cryptococcus infections in 2018?

A I had no involvement in connection with the Cryptococcus infections in 2018. I didn't know anything about them at all at the time. I first heard about them when we were in Ward 6A in January 2019. I heard that there had been two cases in the hospital, one adult and one child. I can't remember specifically who told me about this, or how I heard, but the information was coming from IMT and it would have reached me through the managers or through my colleagues in the pediatric oncology department. We were told that because of these cases, we would have to move out of Ward 6A to allow portable HEPA filters to be put into all the rooms and corridors.

(b) If you were aware at the time:

(i) What Cryptococcus issues arose in 2018?

A I was not aware of cryptococcus issue in 2018.

(ii) When did you first become aware of these issues?

A In January 2019, when our patients were moved out of ward 6A to CDU ward temporarily.

(iii) If you were aware, what actions were taken by NHS GGC to respond to these issues?

A Our patients were moved from ward 6A to CDU ward temporarily to facilitate arranging portable HEPA filters to the rooms and corridor of ward 6A.

(iv) To what extent were issues escalated internally?

A IMT and hospital general management team (Jamie Redfern, Jen Rodgers) team were involved.

(v) To what extent were HPS involved in these issues?

A I don't know whether HPS were involved. I never had any contact with them.

(vi) Who, if anyone, did you report these issues to?

A I was not aware of cryptococcus issue in 2018. We as clinicians were first told about this by the IMT and hospital general management team in January 2019. As the IMT and the management team were already investigating this I didn't have to report it to anyone.

5. In your earlier statement you described Ward 6A being moved to CDU due to Cryptococcal concerns. What were these concerns? To what extent were these concerns linked to the 2018 infections? Why did the ward move? When did Ward 6A patients return to the ward from CDU? What actions were taken in respect of Ward 6A? How satisfied were you that the necessary work had been carried out in respect of the concerns?

A We were told by IMT that on 16th Jan 2019, air sampling on ward 6A had showed cryptococcus spores. However, we were told by IMT that the species

was different, Cryptococcus albidus (CA), which doesn't cause infection in humans. The patients were moved to facilitate arranging portable HEPA filters to the rooms and corridor in 6A. I think we were in CDU ward for 1 week but cannot exactly remember as it is a long time ago. We were reassured by IMT that portable HEPA filters were effective in reducing the spores and further air sampling had not identified spores. I am not qualified to say if portable HEPA filters are as good as the normal HEPA filters. We accepted the advice we were receiving from IMT that portable filters were just as effective.

Cryptococcus 2020

The Inquiry has learned from an email thread (please see copy of Email chain Tom Steele, Jennifer Rodgers, Angela Wallace and other NHS GGC staff – IMT Ward 6A Draft Notes of Meeting – 2 July 2020') that one of your patients may well have had a Cryptococcus infection whilst admitted to the QEUH/RHC in or around late June/ early July 2020. Refer to the IMT 2nd July 2020 and Email chain – Tom Steele, Jennifer Rodgers, Angela Wallace and other NHS GGC staff – IMT Ward 6A Draft Notes of Meeting – 2 July 2020'.

6. Focusing on the question of whether there was the Cryptococcus infection in 2020:

(a) Why was the patient first tested for Cryptococcus?

A We had been treating this particular patient since January 2020. [redacted] was admitted to Ward 6A with fever on [redacted] June 2020. [redacted] was started on broad spectrum antibiotics as per the febrile neutropenia protocol. [redacted] had been on very intensive chemotherapy and was considered severely immunosuppressed. [redacted] continued to have fever over the next few days despite antibiotics. There is a protocol (Febrile Neutropenia protocol) for treating immunocompromised patients if the fever persists for four to five days. Under this protocol one of the things we look for is evidence of any fungal infection. Blood tests were taken to screen the patient for all types of fungal infection including Cryptococcus. I think that Cryptococcus had only recently been included as part of the fungal screening. [redacted] had routine cryptococcal antigen screening test done on [redacted] and [redacted] June. This was reported as a faint line and was

considered potentially positive. Further blood samples were sent to specialised lab in Bristol for confirmation.

(b) To what extent did the patient present with symptoms of Cryptococcus?

A The patient had fever initially, but developed [redacted] June. [redacted] had an X ray of chest that showed ground glass appearance suggestive of infection. Clinical microbiologist Dr. Christine Peters had phoned the ward on [redacted] June 2020 and reported the positive test results and spoke to Dr. Murphy who was on service and advised to do Lumbar Puncture and Cerebro Spinal Fluid examination for CN. They were done. CSF was negative for CN.

(i) Please explain what is meant by CSF. Is CN an abbreviation for Cryptococcus Neoformans?

A Cerebro Spinal Fluid is a type of fluid which is normally present in the cavities of the brain and central canal of spinal cord. It flows continuously from the brain to spine and returns to blood via the sub arachnoid space which is a potential space around the brain and spinal cord. If this fluid is infected it causes meningitis, which is infection and inflammation of the meninges, the protective layer which covers the brain and spinal cord. Yes CN is an abbreviation for Cryptococcus neoformans.

(c) How many different Cryptococcus tests were carried out on the patient?

A There were two Cryptococcal antigen screening tests carried out locally. The first one took place on [redacted] June and showed a faint line and was considered potentially positive. The second test took place the following day on [redacted] June and was definitely positive. Four different blood specimens from those two dates were then sent to the specialised lab in Bristol for confirmation. All four of these samples tested positive in Bristol laboratory including the sample from [redacted] June that had only shown a faint line at the local lab. I refer to my email dated 8th July stating that all of the samples were positive both here and in Bristol.

(i) Can you please clarify whether you mean that the tests, both here and Bristol were positive for Cryptococcus Neoformans.

A Blood tests for cryptococcus were positive both in our local laboratory and in Bristol.

(ii) Are you aware of a CRAG test being repeated on the patient on [redacted] July 2020 with a positive test for Cryptococcus in the QEUH lab? If so, are you aware of the sample results from the specialist lab in Bristol in respect of this test?

A I was aware of this result from the local laboratory. I am not aware of the results from the Bristol lab. The child had recovered from the infection by then and was asymptomatic. Blood tests take a while to become negative.

(d) How many positive test results were there for Cryptococcus in respect of the patient and what were they?

A 4 blood specimens sent to the specialised lab in Bristol were all reported as positive.

(e) Was the patient treated as if they did have Cryptococcus?

A Yes. [redacted] was treated with intravenous antifungal treatment (Fluconazole) for one week followed by oral Fluconazole for one more week.

(f) How did them patient respond to those treatments?

A Very well and symptoms resolved completely.

7. In the IMT of 2nd July 2020 Dr Murphy stated that '*there is no clinical Evidence of Cryptococcus but the patient is being treated as if they have this*'.

(1) At the time did you agree with this statement?

A I did not agree with this point. However, I was not there in that meeting. Dr. D Murphy was present in the meeting.

(2) If so, explain why. If not, explain why.

A As explained above in point 6(b) the patient had symptoms of respiratory infection with fever. Clearly there was evidence of infection in the chest with fever and a high CRP (C Reactive Protein) which is a marker of infection in

blood. I thought there was definitely clinical evidence of infection, plus we had the four positive test results from the lab in Bristol. On 8 July 2020 I responded to the IMT minutes by email to update the clinical course of the patients' disease. (See page 12 of Email chain – Tom Steele, Jennifer Rodgers, Angela Wallace and other NHS GGC staff)

8. In the IMT of 2nd July 2020 Professor Leanord stated that '*there were 3 serum samples from lateral flow test using neat serum. All three were negative by latex agglutination*'.

(1) Is this correct?

A I don't know whether Professor Leonard's comments are correct. These results were not available on the clinical portal (hospital electronic record) for me to see. I don't know what kind of tests he had done in the lab, but there was clinical evidence of infection in the patient and four positive blood test results for Cryptococcus in the lab in Bristol.

9. In the IMT of 2nd July 2020 the hypothesis is noted as follows:
- *Environmental – community or hospital*
- *Testing – false positive*
- *Activation of previous latent infection*

(1) At the time, what was your own view on this hypothesis?

A I was away at that time and Dr Murphy was in charge of the ward. He also attended the IMT meeting. With regards to the source, it is not possible for me to say whether it was hospital or community acquired. [redacted] was not a constant inpatient in the hospital. [redacted] had been in and out of hospital. Hence I cannot tell where [redacted] caught the infection from. I do not have expertise in the field to comment whether a test result is true or false positive. I take advice from microbiology and infection control team regarding this. I did not think that it was false positive testing because there were clinical signs of infection present in the child. We were not just relying on the tests. I thought it was a new infection rather than a latent infection because of all the tests carried out before and afterwards. This child was serially tested both before and after June 2020 and on none of those occasions did the patient have a positive test for Cryptococcus. I had seen the patient earlier in 2020 when he had an admission with

fever, but a CN antigen test carried out on [redacted] April 2020 was negative. After [redacted] episode of Cryptococcus infection in June 2020 further Cryptococcus tests were carried out on a regular basis. CN antigen tests were negative on all of the following dates: [redacted] September; [redacted] September; [redacted] October; [redacted] October; [redacted] October; [redacted] October; [redacted] November; [redacted] November; [redacted] November; [redacted] November and [redacted] December.

(2) What is you view about this now?

A I am not qualified to say what the source is. I am a clinician. We are guided by microbiology and Infection control team. All I can say is that this patient had an illness with fever and respiratory distress with a positive cryptococcal antigen test. In view of this [redacted] was treated with antifungal drugs very promptly and [redacted] responded very well and the illness resolved completely.

10. Describe your involvement in any further action taken following the IMT of 2nd July 2020?

A I responded to the IMT minutes by email to update the clinical course of the patients' disease. Jen Rodgers and I met with [redacted] and explained the issue. [redacted] had seen press statements regarding cryptococcal infection concerns in the hospital and had [redacted] That is what I heard, but I have never seen the [redacted] myself.

11. How accurate are the minutes of the IMT of 2nd July 2020 on the issue? What are any of the inaccuracies? Are you aware of these inaccuracies having been remedied?

A I was not present in the IMT Meeting; hence I cannot comment on the accuracy of what was discussed at the meeting. On 12 August 2020 **(page 12 of**

Email chain – Tom Steele, Jennifer Rodgers, Angela Wallace and other NHS GGC staff). I responded to the IMT minutes by email to update the clinical course of the patients' disease. **(See page 12 of Email chain – Tom Steele, Jennifer Rodgers, Angela Wallace and other NHS GGC staff).** On the same date, Jamie Redfern replied to my email and pointed out that this part of the minute was inaccurate **(page 10 of Email chain – Tom Steele, Jennifer Rodgers, Angela Wallace and other NHS GGC staff)**. I haven't seen any corrected version of the Minutes, so I am not sure if this inaccuracy was ever corrected. The inaccuracy made no difference to the way the patient was treated. I don't know if it made any difference to the IMT and any decisions they made.

12. How satisfied were you with how the Cryptococcus incident in 2020 was managed by NHSGCC? What else could have been done? How could matters have been handled differently? What concerns, if any, did you have about how matters were dealt with?

A I believe that the NHSGGC acted quickly with the concerns of cryptococcus. I am not qualified to comment on whether the measures taken to mitigate the risk were appropriate. We wanted HEPA filters and once the portable HEPA filters were installed, we were quite happy to accept the reassurance of IMT and IPC that these filters were effective. We had no concerns after they were installed.

<u>Dr John Hood's Report</u>

13. Dr John Hood prepared the Report from the Cryptococcus Incident Management Team Expert Advisory Sub-Group, final draft dated 5th April 2022 regarding the Cryptococcus infections at QEUH/RHC. Please refer to Bundle 6 – Miscellaneous documents, document 39.

(a) Did you read Dr John Hood's report regarding Cryptococcus?

A I have never seen the full report. I remember attending a Microsoft Teams meeting where this was presented on 29 July 2022. The Teams Meeting was organised by Jamie Redfern for the Microbiologists and the Consultants

Team. John Hood presented his report at the meeting. It was a very long meeting. I think it lasted at least an hour. Dr Hood spoke about Cryptococcal infections, the genetics of it and the different species of Cryptococcus. He said they had concluded that there was no connection between the infection seen in patients and the environmental samples taken in the hospital. He was quite clear that there was no connection.

(b) If so, when did you read Dr John Hood's report?

A I have never read the report. We were supposed to be sent a copy of the report afterwards, but it was never received. I am aware that the report is contained in Bundle 6 provided by the Inquiry, but I have not read it.

(c) What observations, if any, did you make after reading Dr John Hood's report? What actions, that you were aware of, were taken following the Dr John Hood report?

A In the Teams meeting that I attended when this report was presented, I learnt that the report had concluded that there was no link between the clinical cases to the hospital environment. John Hood was quite clear that there was no connection.

(d) Are you aware of whether NSS endorsed the findings of Dr John Hood's report?

A I am not aware of whether NSS endorsed the findings of Dr Hood's report.

<u>Concluding Questions</u>

14. Why do you think there were Cryptococcus infections in non-HIV patients at QEUH/RHC between 2015 to date?

A Cryptococcus infection could have been acquired from exposure to and inhaling spores from the community or the hospital environment.

15. What are your views about the concerns surrounding the built environment and the Cryptococcus infections at QEUH/RHC?

A Ward 6A was unsuitable for immunocompromised patients because there was no positive pressure ventilation and no source HEPA filters. HEPA filters were not there when we moved to ward 6A in September 2018. Immunocompromised patients should be housed in a ward with HEPA filtration. We complained about this, but we had no choice but to go there. It was supposed to be a temporary move to Ward 6A potentially for 12 weeks, but we ended up staying there much longer than 12 weeks. We were there for a period of about 18 months from September 2018 onwards. This was because there was restructuring work needed on ward 2A and 2B. It was not just a cleaning job as they had anticipated. They had to put in a whole new ventilation system with HEPA filtration. Something was finally done about HEPA filtration in Ward 6A once the Cryptococcus concerns were raised in January 2019. There were concerns from IPC and IMT and they decided that they had to look at the environment. I think from memory that dead pigeons had been found in the plant room. It was only after these concerns about cryptococcus that the portable HEPA filters were brought into ward 6A. I don't know if they were even considering portable HEPA Filters before this point in time. As I say, originally we were only supposed to be there a very short time. However air samplings on numerous occasions on ward 6A did not shows spores of cryptococcus neoformans. Hence the risk was considered to be very low.

16. What else do you wish to add in respect of your knowledge or involvement of the Cryptococcus cases at QEUH/RHC between 2015 to date that you feel could be of assistance to the Inquiry?

A In the June 2020 case involving my patient, I think we caught the Cryptococcus infection quite early and the patient was treated early which led to a positive outcome. I believe it was a new infection and not a reactivation of latent infection. The source of the infection, whether it was acquired in the community or the hospital, made no difference to the way the patient was treated. This patient had been in and out of hospital for a while. Some of the other patients who were more immuno-compromised than this child did not catch Cryptococcus at the time.

Declaration

I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

The witness was provided the following Scottish Hospital Inquiry documents for reference when they completed their questionnaire statement.

Appendix A

A47695221 – Email chain – Tom Steele, Jennifer Rodgers, Angela Wallace and other NHS GGC staff – IMT Ward 6A Draft Notes of Meeting – 2 July 2020 – Cryptococcus – Case [redacted] – 8 July to 13 August 2020 – Original NHS GGC name – Acrobat Document 35

A41890578 – 02.07.2020 IMT minutes Ward 6A

A48185184 – Bundle 6 Miscellaneous Documents

A48184865 – Bundle 9 - QEUH Cryptococcus Sub-Group Minutes

Scottish Hospitals Inquiry
Witness Statement of
Dr Kalliopi Valyraki

Professional History:

1 Please list your professional qualifications, with dates

A 1992-1998 University of Timisoara- Romania, School of Medicine 2009 Qualification as a Microbiologist Specialist

2 Please give your chronological professional history, detailing all roles held where and when- please also provide an up-to-date CV

A 2001 - One year of training in General Surgery 2002 Parasitology in National Public Health School of Greece 2002-2008 Training in Medical Microbiology at Evaggelismos Hospital, Athens, Greece 2009-2011 Consultant Microbiologist in Mitera Hospital, Athens, Greece August 2014- February 2015 Locum Consultant Microbiologist, Raigmore Hospital, NHS Highlands November 2015-September 2016 Locum Consultant at Royal Alexandra Hospital, October 2016- March 2017 Locum Consultant Microbiologist at Glasgow Royal Infirmary, March 2017-present Consultant Microbiologist at QEUH and RHC (when I was first appointed at QEUH, in 2017 I was providing Infection Control (IC) cover for Gartnavel General Hospital (GGH), then I was providing Infection Control cover for QEUH and Royal Hospital of Children (RHC) as part of the Microbiology rota in which all consultants Microbiologists were part off, in February 2018 I was providing IC cover for QEUH and RHC and since July 2021 I am providing IC cover for GGH, Beatson and Partnerships).

3 What specialist interest/expertise/qualifications in any area of Infection control do you hold? E.g., hospital ventilation, water Legionella control and infection control related to the built environment, and epidemiology and outbreak management.

A I don’t hold any specialist interest. I provide routine IC advice

QEUH and the Infection Control Team:

4 Please describe your own role in the management of infections at QEUH/RHC in the IMT structure. Who did you report to, and who reported to you? In essence we need a "mini-CV" covering this period role by role.

A I joined the Infection Control Team in 2017 and this was a very new role, so I was a junior member of the team. In the IMTs, I was either chairing or I was present in order to know what the problem was, so I was able to offer a routine advice if needed. I report to the lead ICD and no one reports to me.

5 Had you had any experience with QEUH prior to this? If so, please give details.

A No, I hadn't, as I was appointed in 2017

6 What was your impression of QEUH when you saw it for the first time. Did you have any concerns from an infection control perspective (other than the proximity of the water treatment works)?

A A modern and impressive hospital. I wasn't aware of any Infection Control issues, as I was providing IC cover for GGH

7 Are you aware of any concern any of your colleagues had from an infection control perspective? If so, please give details.

A I was made aware of concerns that a colleague had, regarding the choice of site and the ventilation.

8 The Inquiry requires to consider whether the choice of sites was appropriate or gave rise to an increased risk to patients of environmental organisms causing infections. From an infection control perspective, do you have a view on whether the proximity of the hospital to sewage works causes a risk to patients? Please explain why you take this view.

A I am sorry, I am not able to provide an answer, as this is out of the area of my expertise but my view is that as long as the water treatment area complies with all the regulatory requirements, then that wouldn't cause a risk.

9 What were your first impressions of the IPC team when you began working there in 2017? In particular were you aware of any of the following issues:

a. existing tensions between staff?
b. lack of clarity around roles and decision making?
c. relationships (i.e., between ICM and ICD)?
d. Issues with record keeping-?
e. culture and bullying; and
f. attitude of senior management and board to infection control issues?

A When I first joined the team, the impression was very good, but after the extended sick leave of the lead ICD, there was some tension especially about the clarity around roles and decision making. That was because the lead ICD had previously offered advice in specialized areas such as ventilation and water, and the IPCT was thereafter asked to offer advice in those areas in relation to which I didn't have the relevant expertise. As an individual working within the team I haven't experienced any bullying behaviour.

Infection Control in General:

10 What is your understanding of how infection within the QEUH/RHC is monitored, investigated, reacted to and reported both internally and externally.

A The information about isolates identified is recorded on a laboratory information system that then communicates with Infection Control patient management system called IC Net and this update or import of information happens every 15minutes. There are sets of triggers and alerts agreed locally and in accordance to national Infection Control Manual, which alerts us to a specific situation. Then Infection Control nurses investigate this case initially and then liaise with ICD if required, we agree an advice and actions that need to be put in place for this specific issue and we monitor the situation going forward. If this is a suspected incident or outbreak, then we act according to the Incidence Management Framework and we report regularly to all the relevant committees by regular reports that we supply to these committees. Then it is escalated accordingly to the Board level. If this requires to be

reported externally, then we report the incidence and outbreaks by outbreak reporting tool to ARHAI, who then reports to Scottish government.

Water System:

11 **The water supply in General**

a) What concerns, if any, did you have about the water supply?

A I wasn't aware of any specific concerns, because Dr Inkster as the lead ICD was involved in water related issues. However during informal conversations or attending meetings, I was aware of issues in general, but I can't provide any specific detail because I wasn't the one dealing with them.

b) Do you consider there to have been a risk of infection from the water supply? If so, explain.

A Theoretically there is always general risk for any hospital, but it's difficult to give an opinion because I wasn't directly involved in managing this situation at that time.

c) Are you aware of remedial measures being taken: e.g. room closure and cleaning; ward closure; investigative and remedial works? What were these and when were they taken?

A I know that ward 2A at RHC was closed for works, but I don't have the requested information, as I wasn't involved.

d) What is your understanding of whether any issues with the water system (including drainage) have been resolved. Are you satisfied with this, or do you still have concerns?

A I don't think that we have established what was the issue, but there has been an extensive program of works put in place to control the water system and at the moment there is an extensive testing program in place that gives us information on stability of the water supply system and the reassuring thing is that we believe the water system is in stable control at the moment.

e) What were the impacts on staff and on patients overall?

A I am aware of the significant amount of work that was put in place in communication with families, I am aware of newspaper articles and other media coverage, but I wasn't involved in this work so I didn't have direct knowledge of any impact that it had.

f) When were you first made aware of the DMA Canyon reports? How did this come about?

A I cannot recall when I first heard of DMA Canyon

g) Some witnesses (e.g., Christine Peters) have said that, had they had sight of the 2015 report at the time, they would not have allowed the hospital to open. Do you agree?

A I am afraid I cannot answer this question, as I don't know what the rationale is behind this opinion.

The ventilation system in General:

12.

a) What concerns, if any, did you have about the ventilation system?

A I was not aware of any specific concerns, because Dr Inkster as the lead ICD was involved in any ventilation related issues.

b) Do you consider there to have been a risk of infection from the ventilation system? If so, explain.

A Ventilation is always a potential risk for infections in every hospital, but I am not aware of any infection as a consequence of the ventilation system.

c) Are you aware of remedial measures being taken: e.g ward closure; investigative and remedial works? What were these and when were they taken?

A I wasn't involved in any work but I know that there were works in regards with ventilation in ward 2A and 2B at RHC.

d) What is your understanding of whether any issues with the ventilation system have been resolved. Are you satisfied with this or do you still have concerns?

A There are reviews and annual monitoring of the ventilation system throughout the hospital and that is a routine work that is happening by Estates, but I am not specifically involved in any of this and I don't have any other information

e) What were the impacts on staff and on patients overall?

A Again, I am aware of the significant amount of work that was put in place in communication with families, I am aware of newspaper articles and other media coverage, but I wasn't involved in this work so I didn't have direct knowledge of any impact that it had.

Particular events:

This section covers the IMTs you participated in personally. Please refer to IMT Friday 2nd March 2018: page 54. This IMT concerned cupriavidus infection in a patient which was matched by typing from a sample in the aseptic pharmacy.

a) What do you recall about this incident?

A I can hardly recall this meeting

b) What was your involvement?

A Dr Inkster asked me to go with her to the IMT but with no further involvement.

c) When and how did concerns first arise?

A There were 2 patients, one with Cupriavidus bacteraemia and the other one with Pseudomonas bacteraemia. The concern was the possible link of these infections with water supply and aseptic unit

d) What Investigations were done?

A 2A outlets, main supply tank, aseptic pharmacy were tested. It was agreed at the IMT that showerheads were to be removed and tested and also typing of the patient and water isolates were to be performed.

e) Was there a hypothesis?

A The hypothesis was that the outlets were the source.

f) If so, was it borne out?

A I don’t know, I wasn’t further involved

g) Were any interventions recommended? If so were they sufficient?

A Outlets and water were to be treated. Yes, I believe that this was enough at that point.

h) In this case, the typing matched a sample taken from a sink in the aseptic pharmacy. What is the significance of this?

A It shows a potential link.

13 Please refer to IMT 6 September 2019: page 354 – this, and the following IMT, concern Gram negative bacteria in paediatric oncology

a) What do you recall about this incident?

A I was providing Infection Control routine advice that day, so I had to be present.

b) What was your involvement?

A This was one meeting of a series of meetings. I was present only once and I had no further involvement.

c) When and how did concerns first arise?

A The concerns arose when an increased number of gram negative bacteraemias was noticed

d) What Investigations were done?

A According to the minutes Hand Hygiene audit and enhanced supervision were performed. A number of isolates was sent for typing and they were waiting the identification of five further samples

e) Was there a hypothesis?

A The hypothesis was about the possible link of the hospital environment with the patients with Gram Negative Bacteraemias

f) If so, was it borne out?

A I don’t know, as I wasn’t further involved

g) Were any interventions recommended? If so, were they sufficient?

A It was agreed at the IMT to review the chemoprophylaxis, to get an update from the Edinburgh and Aberdeen hospitals for any Blood Culture result from the patients that were transferred there and to resample room 6

14 Refer to IMT 19 November 2019 - 2 Pseudomonas cases: page 407

a) What do you recall about this incident?

A The IMT was held in order to discuss 2 cases of Pseudomonas aeruginosa in the ward and to discuss the possibility of these being hospital acquired.

b) What was your involvement? Why were you asked to chair the IMT?

A I was chairing the meeting because Prof Leanord was not able to be present but he dialled in.

c) When and how did concerns first arise?

A The concerns arose when we noticed that there are 2 patients in the ward from whom we have isolated Pseudomonas aeruginosa

d) What Investigations were done?

A Water sampling was done in PICU. Patient's isolates were sent for typing. ECMO machines were tested

e) Was there a hypothesis?

A The hypothesis was to establish if these infections were related to hospital environment

f) If so, was it borne out?

A No link between the 2 patients or between the hospital environment and the patients was identified

g) Were any interventions recommended? If so were they sufficient?

A It was agreed at the IMT that water sampling in the unit and theatre 8 was to be requested, hand hygiene education audit was to be provided and Dr Spenceley had to arrange trial of BD Pure HUB (disinfecting cap that acts as a barrier between line accesses)

h) It was noted that the typing of the 2 patients did not match. What is the significance of this?

A It proves that there was no link between the 2 patients.

13 Refer to IMT 27 November 2019 – serratia marcescens patient in the PICU: page 412

a) What do you recall about this incident?

A This IMT was held in order to discuss a patient with Serratia marcescens in PICU

b) What was your involvement?

A I was present at this meeting, as I chaired the previous meeting

c) When and how did concerns first arise?

A This meeting was convened to review a S. marcescens patient and to have an overall discussion of recent gram negative bacteraemia investigations in the ward

d) What Investigations were done?

A Medical background of the patients was discussed. Water samples was taken. Theatre 8 was tested

e) Was there a hypothesis?

A Serratia is likely a sporadic case in a susceptible patient

f) If so, was it borne out?

A It seemed that there was no link between the hospital and patient but I wasn't further involved

g) Were any interventions recommended? If so were they sufficient?

A It was agreed at the IMT, Serratia isolate to be sent for typing. No environmental sampling was sent at that point, because it was taken previously

18. Refer to IMT 19th January 2021 Serratia in NICU: page 437

a) What do you recall about this incident?

A This was the second meeting that was held in order to discuss the incidence of unusual pathogens in Orthopaedics

b) What was your involvement?

A I was present at this meeting, as one of the Infection Control Doctors that was providing cover for QEUH

c) When and how did concerns first arise?

A **When unusual pathogens were isolated from orthopaedic patients**

d) What Investigations were done?

A The source of the infection was known

e) Was there a hypothesis?

A This was a pseudo outbreak with the source of the contamination being the Ballotini beads

f) If so, was it borne out?

A Yes

g) Were any interventions recommended? If so, were they sufficient?

A QEUH laboratory returned the specific batch number of Ballotini beads to the supplier, but kept some to carry out further testing. All hospitals across GGC and Golden Jubilee were informed to remove any Ballotini beads from the contaminated batch numbers

13 Refer to IMT 12 May 2021: page 455

a) What do you recall about this incident?

A This was the second meeting to discuss a cluster of Serratia marcescens and GNBs in the unit

b) What was your involvement?

A I was present at this meeting as I was one of the Infection Control Doctor providing cover for the south

c) When and how did concerns first arise?

A There was an increased incidence of Gram Negatives in the unit and a cluster of Serratia marcescens

d) What Investigations were done?

A Isolates were sent for typing. Hand Hygiene Audit was carried out. Verification of ventilation was carried out in rooms 6 and 7 and were within all parameters that were required. Drain maintenance procedures were carried out

e) Was there a hypothesis?

A This could possibly be patient to patient or environment to patient transmission and most likely by staff hands or contaminated equipment.

f) If so, was it borne out?

A **I don't know, as I wasn't further involved**

g) Were any interventions recommended? If so were they sufficient?

A It was agreed at the IMT environmental sampling to be carried out. It asked the unit to look at the usual routine practice for all procedures involving gut microflora. Email was to be issued to visiting colleagues in the unit regarding hand hygiene. The Hand Hygiene Co-ordinator to identify ways to increase compliance with hand hygiene.

Concerns about infection patterns:

13 Do you consider that infection rates at EUH were unusual both in frequency and type? Do you consider that there were:

a) more bloodstream/patient infections than normal?

b) more unusual **bloodstream** infections? (we take the point that water sampling/ environmental testing might show up rare organisms that are always present but never tested for)

c) more cases of multiple bacteriaemia in one sample?

A There was enough information to start investigation, but what's normal or abnormal it depends on the parameters you set in order to assess. As far as I am aware there are not such parameters.

21 Did you have any concerns, or are you aware of any concerns that patients were at increased risk of infection from exposure to pathogens via the water supply, drainage, or ventilation system? If so, please describe.

A **That's the hypothesis of the IMTs in relation to water incidence.**

HAI Scribes- refer to meeting notes:

22.

a) Can you explain the purpose of an HAI Scribe?

A HAI scribe is risk assessment tool which is produced when a development/repair/refurbishment/maintenance takes place in healthcare environment, in order to manage/mitigate risk.

b) Whose responsibility is it do to an HAI scribe? Is it one person or is it a collaborative process?

A Estates directorate is providing the scribe to IPCT for comments.

c) What was your contribution, if any, to this one?

A I don't know, if you are referring to a specific scribe, but generally, when I receive a scribe, I review it and provide comments regarding the precautions that need to be taken in order to mitigate issues impacting on Infection Control Risks.

d) What was the outcome of the process?

A Again, I don't know if you are referring to a specific scribe, but generally, when I provide comments, Estates are updating the scribe accordingly.

e) Did you have any concerns about HAI scribes, either the way they were produced or their use? If so, please elaborate.

A Not anything major. In some case ICDs were receiving a Scribe just before the work was about to start.

13 Please refer to minutes of meeting 4 December 2017. You attended a meeting with Christine Peters to discuss HAI scribes. Can you recall:

a) who attended

b) what was discussed

c) what was the outcome of the meeting? If there are any minutes, please provide these.

A I don't have the minutes and I cannot recall the meeting

Staffing levels in ICPT:

24

a) What were the staffing levels like in ICP team while you were there? Were they levels appropriate to manage workload?

A There were always periods of issues with the staffing, due to the unpredictability of the workload

b) Who was responsible for providing staffing and or ensuring staffing was maintained at sufficient levels?

A There is a historic agreement between the Infection Control Management and the Microbiology team about the number of sessions that will be provided by microbiology to cover Infection Control Doctor sessions.

c) Did you or anybody else ever raise concern regarding staffing levels?

A Yes, we have raised concerns, especially when Dr Inkster was on sick leave.

d) If levels were insufficient, why do you think this was?

A Infection Control is an unpredictable area and this needs dynamic assessment and collaboration with Microbiology. The reason of levels being insufficient, was because of unpredictable increase of workload

e) Can you comment on the working environment while you were there? What issues, if any, did you have?

A The working environment in Infection Control was good with the exception of the period that Dr Inkster was absent (sick leave and resignation). That created a situation of tension and lack of clarity of roles.

f) Who did you raise these concerns with, if anyone?

A **I raised these issues to the Lead ICD, Brian Jones.**

g) You stood down from ICPT in 2018. To what extent is this attributable to any of the issues discussed above?

A Yes, the unpredictability in conjunction with the lack of clarity of roles. Also the fact that I was providing Infection Control cover the same time that I was providing microbiology advice was not ideal. These were the reasons that I wanted no further involvement with IC

h) Refer to minutes You attended a meeting on 25 September 2019 regarding staffing issues within ICPT. Who was there and what was the outcome?

A I don't have the minutes of this meeting

Current Situation:

25 Are you still involved in Infection Control at QEUH?

A No, I am covering Gartnavel General Hospital, Beatson and Partneships, unless if I cross cover when a colleague is on leave.

26 (If yes) How are things at QEUH now as compared to the period under investigation? Are you now seeing fewer BSIs, fewer unusual infections and/or fewer samples with multiple infections?

A I am not directly involved with Infection Control issues at QEUH but there is an ongoing surveillance system for bloodstream infections for high risk units. Currently the charts are within control, but if there are fewer or more, this will need to be asked to someone with epidemiological statistical knowledge

13 Do you have any ongoing concerns as to the safety of the QEUH? If so, what are they?

A QEUH campus has such a variety of patient facilities, that each one has its own risks but it's managed and we have surveillance system, processes in place, we have very good working relationship with the management and clinical teams to manage any issues.

27 Do you have any further observations concerning QEUH/ RCYP that you wish to share?

A Everyone is focused on patient safety, there is good collaboration between Infection Control and clinical teams, and we are focused on providing safe environment for patients.

Declaration

I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

The witness was provided the following Scottish Hospital Inquiry documents for reference when they completed their questionnaire statement.

Appendix A

A42909010 – Bundle 1 – Incident Team Management Meeting Minutes

Scottish Hospitals Inquiry
Witness Statement of
Professor Brian Jones

Witness Details

1. My name is Professor Brian Lakelin Jones, and I am a Consultant in Medical Microbiology at Circle Health Group and The Doctors Laboratory, London providing clinical advice to Ross Hall and Kingspark Hospitals. I am also the Infection Control Doctor (ICD) for Ross Hall, Kingspark and Albyn Hospitals and I am an Honorary Professor of Clinical Microbiology & Infection in the Institute of Infection, Immunity & Inflammation at the University of Glasgow.

Education

2. My qualifications are as follows: BSc (Hons, Immunology, Glasgow) 1981, MBChB (Glasgow) 1984, MRCPath 1995, FRCPath 2003, FRCP Hon. (Glasgow) 2012.

Professional Background

3. I trained in medical microbiology in Edinburgh, Glasgow and Cambridge. Prior to my current appointments, I held the following roles: Consultant in Medical Microbiology (1996 – 2020) Department of Medical Microbiology, Glasgow Royal Infirmary, and Head of Service (HoS) for Microbiology (incl. Regional Virology and Reference Labs) NHS Greater Glasgow and Clyde (NHSGGC) Health Board (2013 – 2020).

4. I am a current or previous member of various committees:
    a. Local: - Lead for Infection Teaching for Year 3 Medical Undergraduate Curriculum, University of Glasgow; Lead Microbiologist, Beatson West of Scotland Cancer Centre (WOSCC) & Microbiologist for the Scottish Allogeneic Stem Cell Transplant Programme at the Beatson WOSCC & Queen Elizabeth University Hospital (QEUH); Lead Microbiologist,

Princess Royal Maternity Hospital; Chair NHSGGC Endowments Committee; Lead Microbiologist, NHSGGC Antimicrobial Management Team.

b. National:- Scottish Medicines Consortium – Committee Member & Clinical Expert Advisor; National External Quality Assurance Scheme Steering Group - Public Health England; Medical Director, Scottish Parasite Diagnostic & Reference Laboratory & Scottish Haemophilus, Legionella, Meningococcus, Pneumococcus & Group A Streptococcus Reference Laboratories; Scottish Antimicrobial Prescribing Group (SAPG) - Chair Antifungal Stewardship Group & Chair Guidance for Treatment of Neutropenic Sepsis; Professional Performance Panel of Royal College of Pathology; Examiner in Medical Microbiology for Royal College of Pathologists (RCPath); Specialist Advisory Committee for Medical Microbiology of RCPath; Council of British Society of Medical Mycology (BSMM) - Working Party for Review of Standards in Medical Mycology - Steering Group for UK Online Fungal Registry - Module Tutor: BSMM Diploma in Medical Mycology, University College, London; Scottish Management of Antimicrobial Resistance Action Plan 2006 – Scottish Executive Working Party; Scottish Antimicrobial Prescribing Group NES Education Advisory Committee; Scottish Council RCPath; National Panel of Specialists, Scottish Executive; UK Aspergillus Polymerase Chain Reaction (PCR) Consensus Group - Founding Member of Laboratory Network.

c. International:- European Haematology Association (EHA) Scientific Working Group on Infections in Haematology; European Invasive Fungal Disease PCR Consensus Groups (EORTC/ISHAM) - Clinical Working Parties for Aspergillus, Candida & PCP, and Cochrane Reviews of diagnostic accuracy of PCR for *Aspergillus, Pneumocystis jirovecii* and *Candida* species; European Conference on Infections in Leukaemia - Guideline Working Party on Diagnostics (Galactomannan); Infectious Diseases Working Party of European Bone Marrow Transplantation Society; Infectious Diseases Group of the European Organisation for Research and Treatment of Cancer (EORTC).

5. I am a member of the following societies: European Society for Clinical Microbiology and Infectious Diseases, British Society for Antimicrobial Chemotherapy, Hospital Infection Society, British Society for Medical Mycology.

6. I have regularly peer reviewed manuscripts for several journals.

7. I have received research funding from national grant-awarding bodies and from industry and have published widely from 1992 to date. I have also presented at local, national, and international conferences and have given lectures in Europe, India, Pakistan, Thailand, and the Middle East.

Specialism

8. My professional interests are general microbiology and infection prevention and control (IPC); infections in immunocompromised patients, particularly haemato-oncology and stem cell transplantation (SCT); infections in obstetrics and neonatology; antimicrobial stewardship.

9. I have been involved in the diagnosis and management of infections in haemato-oncology patients in Edinburgh, Cambridge and Glasgow since the late 1980's. One of my specialist areas of interest is the prevention, diagnosis and management of invasive fungal disease (IFD), in particular, the diagnostic utility of fungal biomarkers.

10. IFD, particularly invasive pulmonary aspergillosis (IPA) remains an important cause of morbidity and mortality in haemato-oncology patients. The early diagnosis of IPA is challenging and, as a consequence, early, empirical therapy is employed on suspicion of infection. Due to the low incidence of actual infection, this results in large numbers of patients receiving therapy unnecessarily.

11. Over the last two decades, laboratory and clinical development of detection of aspergillus DNA by PCR and of galactomannan antigen by enzyme-linked immunosorbent assay (ELISA) have shown these tests to have high sensitivity and specificity for the diagnosis of IPA, particularly when used in combination.

Glasgow was involved in UK and European consensus groups which made recommendations on core protocols to be followed when developing PCR tests. Cochrane reviews on the diagnostic accuracy of aspergillus PCR have been published and PCR is now included as one of the microbiology criteria in the EORTC/MSG definitions of IFD.

12. Several clinical studies have shown that these tests, particularly in combination, have high positive and negative predictive values, allowing early therapy or the withholding of unnecessary treatment. A recent multi-centre, prospective study in Europe demonstrated that a policy of galactomannan-directed therapy was non-inferior to empirical therapy in terms of mortality, resulting in significant savings in drug expenditure and reduced exposure of patients to antifungal drugs that are associated with multiple toxicities and drug-drug interactions.

13. Current antifungal prophylactic regimens are highly effective at preventing IFD in at-risk patients both in and outwith the hospital environment. The incidence of IFD in the adult SCT population in Glasgow is extremely low.

14. The primary focus of my clinical research interests has been the adult SCT programme. I have not been involved in the management of paediatric haemato-oncology patients at any time.

15. I have published extensively in relation to fungal infections and diagnostics; however, none of these publications have been directly relevant to the issues at the QEUH.

The Microbiology Department

16. I became Head of Service (HoS) for Microbiology in 2013. I was managerially responsible to the General Manager (GM), who reported to the Director of Diagnostics, and was professionally responsible to the Clinical Director (CD) of Laboratories, who reported to the Chief of Medicine for Diagnostics. Beneath the HoS, there were sector leads for the North and South Laboratories, the Director of the Scottish Reference Laboratories hosted by NHSGGC and the

clinical lead for the Regional Virus Laboratory. NHSGGC Microbiology services were based on two sites: the Glasgow Royal Infirmary (North sector) covering the Glasgow Royal Infirmary (GRI), Stobhill Hospital, Gartnavel General Hospital, Beatson WOSCC, Royal Alexandra Hospital, Inverclyde Royal Hospital, the Vale of Leven Hospital and primary care; the QEUH (South sector) covering the QEUH (previously the Southern General), Royal Hospital for Children, the New Victoria Hospital and primary care. The Reference Laboratories and the Regional Virus Laboratory were based at the GRI site. At the time of my appointment, Prof John Coia was sector lead for the North, followed by Dr Mairi Macleod; Prof Alistair Leanord was lead for the South, followed by Dr Christine Peters. Consultant clinical microbiology and trainee staff were based on each site. The IPC service was not part of the microbiology management structure.

17. While the microbiology services were located in the diagnostic directorate, the IPC service sat in the medical directorate. The IPC manager (IPCM, Tom Walsh) was responsible to the Medical Director for delivery of IPC services. The Lead Infection Control Doctor (LICD) was managerially responsible to the IPC manager and professionally responsible to the Medical Director. As HoS for microbiology, my role was to arrange for the provision of approximately 20 microbiology consultant sessions to the IPC service. I had no input to, or oversight of, these consultant IPC sessions or of the IPC service.

18. As IPC and microbiology services were in separate directorates there was, in my opinion, a disconnect between the two. The two disciplines are interdependent and cannot function in isolation. In fact all microbiology consultants contributed to IPC if required regardless of whether they had IPC sessions. This involved dealing with incidents arising when on-call overnight and at weekends. Any actions would subsequently be communicated to the Infection Control Nurses (ICNs) the following morning or on a Monday morning following a weekend. While the system worked, in my opinion the separation of IPC from microbiology was not ideal. Problems subsequently emerged due to behaviours of colleagues in the South sector (as set out below).

Issues within the IPC service

19. In 2013, Prof Craig Williams relinquished the roles of HoS for microbiology and CD of laboratories. I was appointed HoS and Dr Anne Cruickshank, Consultant Biochemist, was appointed as CD. Prof Williams remained as the LICD until he left NHSGGC in 2016.

20. I have been asked whether, at the start of 2012, I expressed an opinion that I had concerns about Professor Williams having three roles as Head of Service, Clinical Director, and Lead Infection Control Doctor. Yes, I expressed these opinions to Dr Rachel Green, Chief of Medicine for Diagnostics and Isobel Neil, General Manager for Laboratory Medicine.

21. I have been asked whether my concerns included that holding the three roles was a conflict of interest and there was a lack of oversight. On refection, I do not consider 'conflict of interest' to be an appropriate expression in this case. Each of the roles described is a demanding one with significant responsibilities. In my view, one individual does not have the time, while delivering their clinical role as a consultant clinical microbiologist, to adequately fulfil these multiple responsibilities. Concentrating these roles in one person represents a risk to the organisation. In any organisation, particularly one as complex as NHSGGC delivering patient care to a significant proportion of the population, it is not good practice for the head of a clinical service (in this case, the department of clinical microbiology) to answer to himself. This potentially creates a situation where there is lack of oversight and, in my view, does not represent good clinical governance.

22. Following the departure of Professor Williams from NHSGGC in around April 2016, Dr Teresa Inkster was appointed as LICD. I had no input to the appointment process. I believe Tom Walsh and Dr Cruickshank, the CD, were on the interview panel. Dr Inkster had previously resigned from her role as an ICD in 2015. I do not know the reasons for this.

23. At some point in 2015, Dr Inkster and Dr Peters expressed concerns to me related to the culture in IPC. I believe these were related to team structure and the way the service was being delivered. Dr Inkster and Dr Peters felt there was a lack of clarity around their roles as ICDs with regard to decision making and that issues they raised were not being taken seriously.

24. At that time, these concerns, were escalated to Dr David Stewart, the Deputy Medical Director. Several people, including myself, were interviewed by Dr Stewart and the Head of People and Change, Corporate Services. Dr Stewart's report, Informal Review of Infection Control Issues – 2015, **(A47739010 – Summary of Infection Control Issues – September 2015 - Bundle 14, page 464)** was divided into culture and behaviours, leadership style, management skills, team function and structure, service, patient concerns. In Dr Stewart's report he refers to a perception that IPC operated in a vacuum. He was concerned that line management arrangements were complicated, and he made several recommendations about clarifying roles and responsibilities and developing job descriptions. He recommended mentorship, setting objectives through appraisal, consideration of organisational development intervention and ensuring a transparent process for reconciling conflicting advice and opinions.

25. I have been asked whether the report by Dr Stewart, which was produced in September 2015, notes issues in relation to Professor Williams as Lead ICD including; his not being a good team player, not attending meetings, not being collaborative or collegiate, and an extreme risk-taker. Yes, Dr Stewart's report notes the issues described.

26. I have been asked whether I agree that these issues existed in relation to Professor Williams. Yes, I agree with these descriptions.

27. I have been asked if I am aware of whether any remedial actions took place as a result of the report and, if so, how effective they were. Dr Anne Cruickshank, Clinical Director for Laboratory Medicine was appointed interim Clinical Director for IPC to facilitate communication and oversight. Professor Williams also attended for part of the monthly Microbiology Management Team meetings,

although I think this may have pre-dated Dr Stewart's report. However, Professor Williams left NHS GGC the following year. I do not recall any other remedial actions.

28. At the outset of this process I had a degree of sympathy for the concerns expressed by Dr Inkster and Dr Peters. As indicated previously, I did have concerns about the structure of IPC which I expressed in a meeting in December 2017. In his report, Dr Stewart made several comments around team function and structure, such as a lack of political/big picture awareness of some ICDs and unrealistic expectations. Other comments related to decisions of ICDs not being based on wider risk assessment, the limitations of old buildings, issues being escalated without clarifying facts and minor issues being escalated without opportunity for local resolution. I know that Dr Inkster and Dr Peters were not happy with Dr Stewart's recommendations. Looking back at these comments now, they assume greater significance. At the time, I had less insight into the issues to which Dr Stewart referred in his report. These were matters to which I was not exposed as microbiology was effectively divorced from IPC. Over time, however, I developed concerns regarding Dr Inkster and Dr Peters relating to points Dr Stewart highlighted, such as attitudes in the team and unrealistic expectations.

29. Dr Inkster's responsibility as LICD, as far as I understood it, was to advise the IPCM on IPC issues. The IPCM had responsibility for the delivery of IPC, reporting to the Medical Director and Chief Executive.

30. When Dr Inkster was appointed to the LICD role, she was also a consultant microbiologist and retained microbiology sessions in addition to her IPC responsibilities. For her microbiology sessions she was managerially and professionally responsible to me as HoS. However, the majority of her sessions were devoted to IPC where she was managerially responsible to Tom Walsh and professionally responsible to the Medical Director. Taking on-call and supporting professional activity time into account, I do not recall her having many sessions left for routine microbiology. That most of her sessions were devoted to IPC was, in my opinion, a concern as this created a single point of

failure. As was subsequently demonstrated, an already overstretched clinical service was unable to take up the slack when Dr Inkster was absent. Furthermore, from a resilience perspective, it is sensible to have expertise spread more widely across the service.

31. From an early stage, I began to have concerns about Dr Inkster's approach to her role as LICD. It was my perception, through listening to colleagues and observing email traffic, that she seemed unwilling to accept that there were other key players central to the delivery of IPC services and appeared unable to work as part of a team. She interacted poorly with colleagues, her views were rigidly held, and she was often unwilling to accept opposing views from those with relevant expertise.

32. One of my main concerns was Dr Inkster's apparent inability to assess IPC risk *versus* clinical risk as a whole. Furthermore, I do not consider that she adequately assessed the level of risk posed by the hospital environment as she did not give proper consideration to the environment external to the hospital as potential sources of infection. Examples of this were seen in the Ward 6A IMT and the cryptococcus IMT **(A36591627 – IMT Gram Negative Blood Ward 6A dated 13 September 2019, Bundle 1 – IMT Minutes, page 360) and (A36591629 – IMT Gram Negative Blood Ward 6A dated 18 September 2019, Bundle 1 – IMT Minutes, page 365)** (see paragraphs 95-98 and 113-117). This is of particular importance because, as the delivery of clinical care in many specialties has evolved, a significant number of patients receive the majority of their care on an outpatient basis. For example, SCTs are frequently provided on an ambulatory basis where patients, while still profoundly immunocompromised, are allowed to stay in accommodation outside the hospital. Cancer patients receiving chemotherapy *via* Hickman lines will remain at home between courses of treatment. We cannot control the home environment and what patients do outside the hospital environment where they will be continuously exposed to microorganisms. There is a wealth of data that shows that patients become colonised or infected with microorganisms derived from the home environment.

33. We live in a delicate balance with the trillions of bacteria that comprise our normal flora and the microbial milieu in which we live. We do not, and cannot, live in a sterile environment. We are, however, required to deliver patient care within this environment. In order to do so we provide as clean an environment as is practical and we adopt policies and procedures, based on best available practice and recognised nationally e.g. Standard Infection Control Precautions (SICPs) per the National Infection Prevention and Control Manual (NIPCM) to reduce the risk of transmission of potential pathogens. Specialist units will have additional precautions. Regrettably, the ability of many patients to fight infection is compromised, whether this be due to the simple placement of an intravenous line or urinary catheter that breach the host's innate defences or the delivery of chemotherapy for cancer or immunosuppressant drugs, including steroids, that many patients (e.g. organ transplant recipients and patients with inflammatory conditions such as rheumatoid arthritis) receive to reduce the host immune response. Unfortunately, in spite of our best efforts, infections will occur in a minority of patients. Equally, outbreaks of infection will always occur. This remains the case for any hospital in the developed world. However, we adopt evidence-based best practice to do our best to mitigate the risk of infection in our patients.

34. Risk assessment is an essential aspect of the delivery of patient care. The remedial work on the adult BMT unit in Ward 4B in the QEUH is an example of a failure to adequately risk assess. The decision to move SCT patients to the QEUH was made after the design process was completed and it was not technically possible to provide air of the same quality as in the Beatson unit. The reason the transplant physicians wished to move to the QEUH was to access respiratory expertise and intensive care facilities more readily. Indeed, there is a requirement to have an intensive care unit (ICU) bed available for certain types of transplant procedure. SCT recipients frequently develop significant bacterial infections and may deteriorate extremely quickly. Rapid access to intensive care support is essential so if SCT patients had remained at the Beatson this would have meant transferring patients across the city with the significant risk that this posed. The transplant physicians believed that any risk arising from reduced air quality in the QEUH was more than

counterbalanced by the immediate access of intensive care facilities for their patients, if and when they required this level of life support.

35. In my view too, the reduction in quality of air in the QEUH unit was of little or no consequence, particularly as a ventilation system provides more limited protection compared to prophylaxis (see later comments) which protects patients for the duration of their at risk period, the majority of which may be spent outside the hospital environment. Medical practice continually evolves and current prophylactic regimens, particularly with newer azole antifungal drugs such as posaconazole and isavuconazole, are extremely effective at preventing infection with moulds such as aspergillus. In addition, biomarker monitoring strategies (using PCR for detection of fungal DNA and assays for detection of fungal antigens (e.g. aspergillus galactomannan) are very effective at identifying patients with sub-clinical infection (and excluding infection), allowing early targeted therapy. I have spent more than two decades working on the diagnosis and management of infection in SCT patients and expressed my views to Dr Inkster. Regrettably, these were not accepted. Perfection can rarely be achieved, but care must be delivered in as safe a manner as is practical. Unrealistic expectations and dismissal of expert opinion does not benefit patient care.

36. I took on the role of Acting Lead (more accurately, coordinating) Infection Control Doctor between July 2017 and December 2017 when Dr Inkster was on sick leave. This was not a role I coveted as I was busy enough with my clinical and HoS responsibilities. No other ICDs or consultant microbiologists were willing to take on the role because of, in my opinion, the toxic environment in the South sector. I believe Dr Peters wished to assume the responsibility; however, it was made clear to me by senior management that she was unacceptable to the organisation due to her disruptive behaviour. I took on the role simply because the IPC service required to function to ensure patient safety. It should be noted that Dr Inkster was on almost a full-time ICD role and I did not relinquish any of my existing responsibilities.

37. When I took on the role as Acting LICD, I was not given a job description. My understanding was that I was to function as a source of advice to Tom Walsh and Sandra Devine, to help out if there were any major developments and to try to ensure that projects that had already been planned and agreed e.g. the alterations to Ward 4B, were delivered. While the ICD service functioned effectively in the North sector, it was considerably more problematic in the South, due primarily to the difficult environment created by Dr Peters' behaviour.

38. My comments above in relation to Dr Inkster at paragraphs 26 and 27 in relation to my view of her inability to work as a team, rigidly held views, being unwilling to accept expert opinion that differed from her own, inability to assess risk etc. apply equally to Dr Peters. Further to this, she often showed a lack of respect for other opinions and if you disagreed or challenged her, you became the opposition and were accused of undermining or bullying her. Also, Dr Peters did not follow established procedures and governance structures and often acted outwith her purview which made the provision of service extremely challenging. In particular she accepted no responsibility to seek solutions to issues that had arisen. Several examples of these behaviours are set out below.

39. In 2017 Dr Peters approached the CD and the GM for laboratories expressing concerns about the sector lead for the South. Dr Peters did not follow the established structure and consult with myself as HoS before doing so. The sector lead was then asked to demit the role by the CD and GM. I did not share these concerns and advised against this. Dr Peters was the only applicant for the vacant role and was subsequently appointed as lead for the South sector.

40. On one occasion Dr Peters, as lead for the South, refused to provide IPC services. I cannot now remember what the specific issue was, but I recall being in London and receiving calls from managers. As a result, I had to email Dr Peters to remind her that, in addition to their contractual obligations, microbiology consultants, as medical practitioners, had a professional duty to provide IPC advice. Dr Peters' response was to suggest that the obligation to provide a service lay with management (even though as the lead for the South

sector she was part of the management structure with responsibility for service provision in that sector) and that my email amounted to harassment.

41. Dr Peters assumed a self-appointed role as the guardian of patient safety (despite behaviours which appeared inconsistent with this) with a remit to police the IPC service even though she had resigned her role as an ICD in November 2015. In my view, and that of others, she would pursue her objective without looking at the bigger picture and without any regard for the collateral damage that might result from her actions, potentially compromising patient safety. Dr Peters continually undermined the IPC service, both the nurses and the doctors. Dr Peters would bombard colleagues with emails questioning actions, demanding information and responses. Many of these emails were lengthy and would have required significant time to deal with. It was a form of harassment, and was highly disruptive, not just to microbiology but to the organisation. It led to colleagues questioning their own actions, creating enormous anxiety and an environment in which it was difficult to work. This was despite the existence of agreed policies, Standard Operating Procedures (SOPs), plans, established oversight, and robust systems of governance in NHSGGC. These actions were hugely disruptive to the effective, safe working of the IPC service.

42. The culture of fear was pervasive. I once asked a consultant if he would take on some ICD duties in the South sector. His response was that he would go only if absolutely necessary but I needed to understand that, even though he was a consultant, his actions would be scrutinised and criticised. In addition, there was a complete breakdown in relationships between Dr Peters and the Infection Control Nurses who I understand considered raising a grievance.

43. While I agree that a few issues were reasonable to raise, there were generally satisfactory explanations. I think, for example, it was not unreasonable to raise the question of three air changes versus six per hour in a single room. While I am not an expert in ventilation I know that the relationship between air quality and number of air changes is not linear. The additional benefit from six versus three air changes is not substantial. While there is a recommendation that six air changes should be provided, it is necessary to be pragmatic about applying guidelines, taking clinical risk into consideration. The general wards (comprising

single room accommodation) have three air changes; I understand incoming air to the hospital is filtered to a high standard - Tom Steele will be able to confirm the specification. However, robust surveillance mechanisms provide no evidence to support that this has contributed to any increase in hospital acquired infections.

44. In 2018, Dr Inkster and I expressed our concerns about Dr Peters' behaviour to Dr Green, the Chief of Medicine for Diagnostics. On 20 April 2018 Dr Inkster sent an email to Dr Armstrong, the Medical Director and Dr Green.

> "Dear both, please see two emails below from colleagues in response to an update I sent out regarding a water incident this morning. I have discussed with Brian, and I've highlighted, I feel I am in a no-win situation here. I have been criticised for my lack of communication. When I send out updates, they are subject to undermining and critique. I am not being open implies that I'm not being open and transparent, which is not the case."

45. On a weekend when Dr Peters was on call she halted a programme of work, that had already been agreed by IPC and Estates, to upgrade Ward 4B at a time when the SCT unit had been returned to the Beatson (see paragraph 72). I do not believe Dr Peters was an Infection Control Doctor at this time.

46. It is my view and that of others that she undermined the IMT meetings for Ward 6A after she had left the committee by briefing the haemato-oncology consultants separate to the IMT (see paragraph 112).

47. On another occasion I was contacted by management in the QEUH to say that Dr Peters had withdrawn the microbiology service to the ICU in the QEUH and that a consultant microbiologist would not be visiting the unit. ICU physicians rely on daily visits by microbiologists to discuss infection related issues and antimicrobial therapy. I discussed this with Dr Peters on the phone and in person at the QEUH and suggested that while, by her account the department may be stretched, rather than do a full ward round, a brief visit to identify and discuss

the main problems would suffice. She refused, accused me of bullying and using inappropriate language.

48. It seemed that a situation had been reached where almost any infection was unacceptable to Dr Peters. For example, IPA is an uncommon but serious infection in neutropenic haemato-oncology and SCT patients, and in ventilated patients following viral respiratory infection. Dr Peters gave a presentation about COVID-Associated Pulmonary Aspergillosis (CAPA) to a meeting at which several NHSGGC microbiology and infectious diseases trainees were present. In my view this presentation was significantly misleading and often factually inaccurate. CAPA is a well-recognised syndrome and has been investigated extensively in Europe and elsewhere with development of definitions, and diagnostic and management strategies. The impression given was that IPA and CAPA are hospital acquired infections. However, aspergillus spores are ubiquitous in the environment and are inhaled continuously by everyone. The epidemiology remains incompletely understood but in SCT recipients there is clear evidence that reactivation of spores is responsible for a significant number of infections and it is probable that the majority of cases of invasive aspergillosis are community acquired. There are, of course, situations where infection may be hospital acquired, but this is uncommon. In hospitals, as in any building, water leaks may go undetected, creating areas of dampness allowing fungal overgrowth. Dr Peters' comments about the use of aspergillus PCR and galactomannan ELISA were misleading. She stated that PCR had not been standardised and that β-lactam antibiotics interfered with the performance of galactomannan. Both statements are untrue and wrongly cast doubt on the utility of these well-established tests in the diagnosis of invasive aspergillosis. In my professional view it is extraordinary that someone presenting to colleagues and trainees should be unaware of these facts. Furthermore, Dr Peters stated that she did not like hard and fast definitions. Definitions of CAPA were developed to allow accurate diagnosis and appropriate, timely management of infection. While all doctors are entitled to use their clinical acumen, deviation from accepted definitions does not represent good medical practice and should always be justified. I was particularly concerned about exposure of trainees to this degree of misinformation. I do not recall anyone

raising their disagreement, as challenge is not something Dr Peters tolerates well. To quote a response I recall receiving from Dr Peters when challenged: “check my record, I am never wrong”. It seemed to me and others that Dr Peters’ position is that any infection represents fault. This is untrue. As indicated above, no matter our best efforts, infections, particularly in compromised patients, will occur.

49. If a patient develops an infection, it is not by definition the fault of an individual or the building.

50. Healthcare Associated Infection (HCAI) is defined as an infection that develops within 28 days of receiving healthcare. It does not mean hospital acquired. For significant durations, patients may be outwith the hospital and exposed to microorganisms in those other environments including receiving care in other healthcare facilities. That an infection is diagnosed (revealed) in hospital itself does not necessarily indicate that it was hospital acquired. The potential sources of infection require careful, pragmatic assessment. Another example is infection with *Stenotrophomonas* spp. This is a Gram negative organism that is ubiquitous in the environment and associated particularly with water. It may cause serious infections, often line-associated, particularly in immunocompromised patients. Development of a *Stenotrophomonas* infection in hospital does not necessarily mean that you acquired it in hospital. Medical care is largely delivered on an outpatient basis (even for compromised patients) or with short hospital stays where possible. As indicated above, we live in a microbiological milieu where Gram negative organisms including *Stenotrophomonas* spp are widespread, including in the home environment. Patients may become colonised with such organisms outside the hospital environment. There is a wealth of evidence in the literature to support this view.

51. In relation to an SBAR produced by Dr Peters, Dr Penelope Redding, and [redacted] a meeting was held with senior medical and Board managers on 4 October 2017. **(A32353240 – Infection Control Issues meeting - 04 October 2017 - Bundle 12, page 883).** They had raised several concerns about infection control issues in the QEUH and elsewhere. I attended the

meeting as HoS for Microbiology. My recollection is that the meeting was chaired very effectively by the Medical Director and every concern expressed in the SBAR was carefully considered. Drs Peters, Redding and [redacted] were given full opportunity to present their concerns, and there was no attempt made to evade or dismiss any of the issues raised. I had no input to the preparation of the response, but to the best of my knowledge all the concerns expressed were subsequently addressed in detail in a 27-point action plan.

52. In reference to the email from Jennifer Armstrong dated 08 March 2020, forwarding email dated 17 October 2017 from Tom Walsh to Brian Jones and others regarding the role of Infection Control Doctors, I do not recall this being in response to the SBAR raised by microbiologists in 2017. **(A38694852 – Input of ICD on issues re built environment – SBAR dated 6 December 2018, Bundle 4, page 136). (A38759270 – Action Plan arising in response to SBAR of 3 October 2017 – 5 December 2017, Bundle 20, page 792)** I convened a meeting in December 2017, as I had separate concerns about the structure and the model for IPC delivery. Tom Walsh's SBAR represents a summary of the discussions that we had.

53. Dr Keith Morris, Consultant Microbiologist in Fife, had developed a national, generic review of the delivery of IPC services. This was not a result of a review of the IPC service in NHSGGC. Dr Morris's views largely mirrored my own and his paper was discussed at the December 2017 meeting I mention above. As I remember, most of the relevant senior staff were present at this meeting; the Chief of Medicine for Diagnostics, the GM for Labs, Dr Peters as Microbiology Lead for the South; Prof John Coia as Microbiology Lead for the North; Dr Anne Cruickshank as CD for Labs; Tom Walsh as IPC Manager; and Sandra Devine as Lead Nurse for IPC. Dr Inkster was invited but was unable to attend. From the IPC Doctors' perspective, my concern focussed on the separation of the IPC service from the microbiology service. IPC evolved out of microbiology in the 1980s and the two disciplines are natural bedfellows, and I thought the structure at that time was neither helpful nor conducive to effective communication and team working. I was keen to bring the Lead ICD into the microbiology management structure to sit alongside the sector leads, and virology and

reference lab leads, attending the microbiology management team meetings. In my view this would have improved communication between the services and provided improved stability and resilience.

54. My proposal was that, as all microbiology consultants provide infection control advice out-of-hours and at weekends with some having more substantial sessional commitments, they should rotate through IPC on a six-monthly or yearly basis. I suggested that of the 20 consultants in the service, two or three on each site could take on enhanced IPC responsibilities for a period of six to twelve months. Several of the microbiology consultants had been recently appointed and it was agreed that it would be beneficial for them to gain this experience. After three or four years the service would then have a pool of microbiology consultants who all had significant IPC experience. Some consultants might then subsequently choose to retain their role in IPC and develop specialist interests such as the built environment, water or decontamination. Ultimately, this would have provided a much more robust IPC service with better communication which in turn would have been more responsive to requirements. It was unanimously agreed that this model of IPC service delivery should be adopted.

55. I think the proposed structure would have improved the resilience of the service and lessened the impact of a single point of failure where one person carried significant IPC responsibilities. I understand the proposed structure has been adopted in the North sector; however, I am unaware of the current circumstances in the South.

56. Dr Inkster's initial reaction to the proposed structure was that it represented a demotion for her and rather than work with colleagues to improve the service she resigned from her role as Lead ICD. I disagreed with the content of her resignation letter. Dr Inkster was not being demoted and as already stated, the proposed structure was designed to create resilience and improve communication. Furthermore, it had been agreed at the December 2017 meeting by all parties responsible for managing input to the IPC service. Dr Inkster's resignation demonstrated the single point of failure she represented

and served only to destabilise the service. The following week Dr Inkster emailed me and stated: “First of all I would like to apologise to you for some of the content of my resignation. On reflection I think I underestimated how difficult it must have been to cover my workload, (which included some challenging projects in the QEUH) in addition to your Head of Service role. Thank you for all your hard work on this.”

57. The LICD was not was not brought back into microbiology structure and the IPC service now sits in the Nursing Directorate. Dr Inkster had created a situation where she carried significant numbers of IPC sessions and responsibilities. Furthermore, the influence of Dr Peters in the South sector made the delivery of IPC more problematic. Dr Inkster was responsible for delivery of a core patient safety function and resigning with immediate effect was, in my view, irresponsible as the role could not be filled at such short notice. Perhaps if this had been done in a phased manner the impact on the service would have been more manageable.

58. It has been suggested that ICDs resigned their roles due to pressures from the organisation. I reject this view. I know of at least one of the ICDs who wished to pursue other interests. My perception was that the volume of clinical work combined with the chaotic environment and culture of fear (fear of being criticised) in the South sector led to an understandable lack of enthusiasm on the part of consultants to take on IPC responsibilities. I remember having meetings with individuals to try and find a way forward and encourage them, but it was a very difficult situation.

59. One particularly challenging incident involved the detection of an extremely resistant Gram negative organism in a patient who had been admitted to the orthopaedic trauma ward in the QEUH. There was a concern that cross transmission may have occurred on the ward and a Problem Assessment Group (PAG) was arranged for the Friday evening. Consultant microbiologists in the South were aware of the meeting but none attended and the meeting was chaired by Sandra Devine. At this meeting, a decision was taken to close the orthopaedic trauma ward. Closure of the orthopaedic trauma ward in the QEUH

was a significant undertaking with potentially serious implications for provision of patient care. On the Saturday morning I reviewed the relevant results which established that there were no links. Following a meeting on the Saturday afternoon chaired by the Medical Director at which senior orthopaedic medical, nursing and lay management were present, the decision was taken to reopen the ward. I understand the relevant information was available on the Friday so regrettably the ward was closed unnecessarily. This represents a significant patient safety issue and is a further example of the chaotic environment in the South sector.

60. In May 2018 Dr Linda de Caestecker, Director of Public Health in NHSGGC, led a review into concerns expressed by Dr Peters and Dr Redding. Several people, including myself, were interviewed as part of the process. As I recall, many of the complaints had already been raised at the meeting with senior Board management in October 2017. For example, there were complaints about sewage ingress in the Neurosurgical Institute. These issues were well recognised and were being addressed as best they could given the age and design of the building. Dr de Caestecker's comments on Dr Peters' behaviour were insightful - that needing to know too much detail on issues not within her remit caused stress for others and took time away from their main job.

61. I have been retired for over four years, so I am not fully informed regarding the IPC service now. I understand neither Dr Inkster nor Dr Peters are ICDs and Dr Inkster has left NHSGGC. Dr Linda Bagrade and Dr Aleks Marek now provide leadership for the service.

The Adult BMT Unit and Ventilation

62. I had only peripheral involvement in the ventilation issues associated with Ward 4B (the BMT unit) and have little detailed recollection of events.

63. I did not have input into the new hospital in terms of planning, design or build. I would not have expected to be involved in any part of the design for the new hospital. I was not involved in the decision to move the SCT unit to the QEUH

which was made well after the hospital had been designed. This was a clinical decision. I am not an expert on the technical aspects of ventilation and Prof Williams did not ask me for my views on reconfiguring the QEUH to accommodate the SCT unit nor would I have expected him to. I believe Dr John Hood, consultant microbiologist based in GRI, who had a wealth of experience in air handling, having been closely involved in the design of the Beatson SCT unit, was involved.

64. I remained based at GRI when the QEUH opened, attending on site as required. I was the microbiologist for the Scottish Allograft Programme based at the QEUH and attended the weekly multi-disciplinary team (MDT) meeting to discuss the transplant patients. Much of the clinical advice was given by phone.

65. I did not have any involvement in the design of the ventilation system in Ward 4B in QEUH. The SCT physicians were keen to move after the hospital had been built in order to have respiratory and ICU support on site (see paragraphs 29-30). Given their rationale, based on an assessment of the relative risks inherent in the two sites, I thought this a reasonable request. I think Estates and the SCT physicians understood the difficulties in achieving the quality of air in the QEUH that existed in the Beatson. I understood this to be due to the physical constraints of the new building and the limitations of the existing plant. That said, on balance of risk, it made more sense in terms of patient safety to accommodate SCT patients in the QEUH. In all areas of medicine, knowledge and practice evolve as new evidence becomes available. My own practice, and that of the SCT physicians, evolved as newer antifungal prophylactic drugs and diagnostic strategies (based on biomarkers) became available.

66. It has become increasingly apparent that air quality is less important an issue than had previously been thought. Prophylactic strategies are extremely effective, diagnostic algorithms are both sensitive and specific, and transplant practice has moved in many UK, European and US centres to an ambulatory format where patients (if stable) are accommodated nearby, outwith the hospital environment i.e. in unfiltered air.

67. By 2017, in my view, the requirement by Dr Inkster and others to achieve the air quality standards in SHTM 03-01 guidance were not essential to safe, effective care of transplant patients. It should be noted that there are different recommendations from different bodies on the quality of air required. The Joint Accreditation Committee ISCT-Europe & EBMT (JACIE) is the European accreditation body for SCT units. JACIE recommend High Efficiency Particulate Air (HEPA) filtration with positive pressure for high-risk patients but do not give specifications. There is an understanding that these are not always available and, if that is the case, single patient rooms should be located on a patient care unit where infection control policies can be implemented. The National Institute for Clinical Excellence (NICE) recommends single rooms with no mention of HEPA filtration or positive pressure.

68. Air quality is only one mitigating factor in the prevention of infection in transplant recipients – prophylaxis and rapid diagnosis are pivotal. Antifungal drugs such as posaconazole and isavuconazole are fourth generation azole drugs with potent activity against aspergillus. Both agents, in particular posaconazole, have been shown to be extremely effective in antifungal prophylaxis studies with a wealth of real life supporting data. There is also good *in vit*ro evidence at the cellular level demonstrating the efficacy of posaconazole. These drugs have effectively changed the landscape. As previously mentioned, we also have diagnostic strategies that employ biomarkers and radiology which allow early diagnosis and appropriate therapeutic intervention. JACIE does not mandate SHTM 03-01. The SCT unit in the QEUH is accredited by JACIE.

69. The decision to move the adult SCT site to the QEUH from the Beatson, was a clinical one based on a requirement for ICU and respiratory support, which they did not have at the Beatson. While this was not my decision, if I had thought there was a risk to patient safety I would have expressed my concerns. It was assumed that the haemato-oncology unit at the QEUH was being built to broadly the same specification as the Beatson. Prof Williams advised that the original specification provided to Brookfield, if delivered, would have provided a safe environment for this vulnerable group of patients. I have no reason to disagree with that. Prof Williams was the LICD at the time issues with ventilation were

raised by Dr Inkster and Dr Peters. I think the air particle counts were considered high. I recall being copied in to emails between Prof Williams, Dr Inkster, Dr Peters and Dr Hood regarding ventilation specification but I cannot recall the details. In 2017 when Dr Inkster was the LICD, I discussed with her the way in which management of transplant patients was evolving and that air quality was not as crucial as once thought as there were a variety of measures that could be taken to mitigate risk e.g. prophylaxis and diagnostics. My advice was not accepted.

70. Sometime in 2015 Prof Williams produced an SBAR identifying deviations in the current specification versus that in the design. I think this was produced in response to high air particle counts. I had no involvement as this was driven by IPC.

71. Two meetings were held on 1 July 2015 to discuss the possibility of returning the BMT service to the Beatson. I was present at the first in my role as the microbiologist for the clinical service to discuss contingency plans on the basis of Prof Williams' findings regarding the unit specification. Dr Inkster, Dr Peters and SCT physicians and (I think) senior nursing staff were present. Prof Williams was on holiday. There were discussions around prophylaxis and the specification. I think at this point the clinicians were content to stay in QEUH but contingency plans were considered for a return to the Beatson if air particle counts remained high. Following another meeting that day, at which I don't remember being present, it was decided to move back to the Beatson. Dr Anne Parker sent an email on 6 July 2015 representing the views of all the consultant haematologists. It set out the current situation and why they had decided to move to QEUH in the first place. Their recommendation at this point was for the patients to move back to the Beatson.

72. The decision to move back was made because the ventilation in Ward 4B was to be upgraded. My understanding was that Brookfield had not built it to the agreed specification of sealed, HEPA filtered rooms with 10 Pa positive pressure and 12 air changes an hour. There was also no method of measuring pressure gradients properly, and the pentamidine room did not have negative

pressure. Brookfield subsequently agreed to rebuild the unit to the original specification.

73. The patients moved back to the Beatson in July 2015, and Brookfield completed the agreed work at the QEUH in October of that year. In November, I think a decision was made to move back to the QEUH; however, Health Protection Scotland (HPS) produced an SBAR with additional recommendations and the move back was postponed. **(A33680939 – NHS National Services Scotland: SBAR Documentation – Bundle 3, page 36**). There was disagreement over whether the corridor should be HEPA filtered or not. The engineers were having difficulties in achieving the specified air changes and positive pressures, but I do not know the detail. Health Facilities Scotland (HFS), Public Health England (PHE) and HPS were all involved at that time. I believe the SBAR stated that ideally the corridor should also be HEPA filtered, but this was normally only achieved on a purpose-built unit and is less important if the rooms are appropriately ventilated and achieve positive pressure in comparison to the corridor.

74. I understand that discussions continued throughout the first half of 2016 regarding the exact specification required and what could physically be provided and whether the corridor needed to be HEPA filtered. By May 2016 the SCT consultants were concerned that their patients remained off the QEUH site with the attendant risks associated with this described earlier; they considered that, with the measures already taken, air quality was going to be adequate albeit the specification did not fully meet HPS requirements. I believe discussions were ongoing regarding the relative risk from the environment versus that from patients being cared for on a site without critical care facilities. In June 2016 David Loudon confirmed to Regional Services senior clinical and management teams, “as agreed at our meeting this morning, I have agreed to confirm capability and capacity of existing system to provide room pressure at eight to ten pascals and air changes at a minimum of ten ACH, provision of a solid ceiling in the rooms will be straightforward.”

75. At the AICC on 5 September 2016 I believe a comparison of key structural air quality controls of units across the UK was presented to the Board with the proposed QEUH unit falling below the standards implemented in other units. **(A40241424 – AICC Minutes of 5 September 2016 – Bundle 13, page 39).** I wasn't involved in this work; however, it is worth noting that, in King's College Hospital, London, the largest allograft transplant centre in the UK, a significant proportion of transplant beds are not HEPA filtered and SCT patients are routinely accommodated outwith the SCT unit.

76. I believe further discussions continued throughout 2016 and into 2017 as concerns continued to be expressed about the failure to co-locate SCT services in the QEUH and a requirement to prioritise this over IPC concerns. In June, a plan of work was agreed by IPC, Dr Inkster, Estates and Regional Services management involving recommissioning plant, sealing rooms and installing solid ceilings. This was to commence in late July with completion by September. Unfortunately, Dr Inkster was absent from the end of June 2017. [redacted] was the covering ICD at this time. The work was halted on 19 August 2017 by Dr Peters (who no longer held an IPC role) just as it was due to commence. The nature of her concerns remain unclear. Following Dr Peters' intervention [redacted] was no longer willing to take responsibility for signing off the HAI SCRIBE (an online risk management tool used by IPC and Estates) as the ICD and suggested, incorrectly, that I was also uneasy about signing off. I subsequently agreed to lead the project relating to building and commissioning works from a coordinating ICD perspective, seeking expertise from other GGC, HPS and HFS colleagues as required. However, on her return to work in January 2018, Dr Inkster resumed oversight of the project. SCT patients finally moved back to the QEUH at the end of June 2018 after a six month monitoring period. I had no further involvement once Dr Inkster returned.

77. In response to a request for guidance on sampling, HPS issued an SBAR in October 2017 stating that while the rooms met the 10 Pa pressure standard, the number of air changes at 6 per hour fell short of the 10 recommended. **(A38029521 – NHS National Services Scotland: SBAR Documentation - Bundle 3, page 57).** NHS GGC continued to work towards these

recommendations but I'm not sure the plant could physically deliver the specifications required. I do not know details of the current parameters achieved in ward 4B. However, I know that patient safety was the paramount consideration by all parties involved in the risk assessments around the works proposed which were monitored via the Board's clinical governance and IPC committees. My own view was that if the rooms were sealed and patients received effective prophylaxis then deviations from the HPS recommendations did not represent a risk to patients. Furthermore, I did not think the corridor needed to be HEPA filtered.

78. Air sampling would have been requested by either IC or Estates, performed by microbiology biomedical scientists (BMSs) on site and processed at GRI.

79. As a result of the issues surrounding air quality in ward 4B, the Board was referred to the Health and Safety Executive (HSE) in (I think) 2019. I was interviewed by HSE and shared my view, outlined above, that there were actions we could take to mitigate the risk of IFD and that hospitals like King's College and St Bartholomew's Hospitals in London and elsewhere in the UK were treating immunocompromised patients without state-of-the-art HEPA filtered positive pressured air. The infection rate due to fungi in the adult SCT unit in the QEUH was and still is extremely low and compares very favourably with any other units in the UK. So, despite the controversy, the bottom line is that our infection rates are extraordinarily low with only the occasional case of invasive aspergillosis. I understand that, following their investigation, HSE decided not to take further action.

80. In my view, even if the specification that HPS had set out in their initial SBAR had not been achieved, it did not represent an infection risk given the mitigating actions taken. HEPA filtration in a room/unit can provide protection for patients against airborne infection for only as long as the patient remains in the room. As aspergillus spores are ubiquitous in the environment, it does not protect against the spores that are in the hair and on the clothes of visitors and healthcare staff who come to that room. The patient may require to go to other parts of the hospital (e.g. radiology) through corridors which do not have the

same level of ventilation. Most importantly, SCT patients remain at significant risk for many months, and only spend a short part of that time in hospital. So filtered air is only one part of a package of preventative measures taken to reduce the risk of infection. In my opinion, the evidence suggests that antifungal prophylaxis now assumes a much greater role in that package of measures and reduces the level of risk more effectively than having filtered air in the hospital, particularly as it provides protection throughout the entire period of vulnerability.

81. Dr Parker commented that she and her colleagues appreciated that the air quality was not as good as the Beatson, but they considered that to be an acceptable risk. The team knew that following the move, there would need to be some compromise in environmental quality, but the transplant team were assured that the qualitative environmental care provided would be sufficient for the population. After consideration, the team felt that the move provided a significant gain in quality of care for transplant patients due to colocation with acute specialities and critical care support.

82. I am aware that there were also concerns about the paediatric BMT unit. I was not involved in the care of paediatric transplant patients.

83. I have been shown an email dated 11 September 2015, which refers to air sampling in some of the cubicles of Ward 2A, where I have advised that there was no advantage to resampling. **(A40364520 – Email from S McNamee re paediatric BMT – 11 September 2015 - Bundle 6, page 29).** I do not know why I would have been consulted because I had no role in IPC. It was possibly in my role as HoS for microbiology as microbiology provided the resource for air testing. As far as I can remember, I advised that further air sampling was not indicated at that point because the modifications had not been completed.

84. Air testing requires a significant resource. It would take two BMSs several hours to travel to the QEUH with the necessary equipment and perform the sampling. Air sampling was usually requested by IPC and there were programmes of regular testing on particular units. I was not involved in air sampling, other than to provide resources for it.

85. I am not an expert in general hospital ventilation other than in the SCT setting where HEPA filtration is one component in a package of measures taken to mitigate the risk of infection including prophylaxis, good medical/transplant care, and timely access to radiology and rapid diagnostic tests. I have no experience of thermal wheel technology or chilled beam technology. I understand chilled beam technology is an energy efficient method of heating and cooling and is not recommended in high-risk settings. PPVL rooms are associated with a health building note from 2005 and represent a method of providing protective and source isolation.

86. It is not unusual to find building work ongoing at hospitals. Building demolition is particularly associated with airborne risk for compromised patients as the dust created will contain fungal spores. This is why water is often sprayed onto areas of demolition in order to minimise dust release.

Prophylactic Medication

87. The use of prophylactic medication is a complex topic covering a broad range of patients and clinical circumstances e.g. surgical prophylaxis, prophylaxis following exposure to meningococcal meningitis, prevention of malaria infection in endemic areas or the prevention of infection in immunocompromised patients. Haemato-oncology patients e.g. acute myeloid leukaemia, are at high risk of infection due to their underlying disease and the chemotherapy they receive. Allogeneic transplant recipients have their immune system effectively ablated and are highly compromised until the donor cells engraft and begin to function. However, they remain immunocompromised for several months after engraftment. In allograft recipients, the development of graft versus host disease (GVHD) and its treatment renders the patient further compromised.

88. Haemato-oncology patients, including SCT recipients, are susceptible to bacterial, fungal and viral infections. Infections may be due to conventional pathogens but also opportunistic pathogens that don't normally cause serious

infection in healthy individuals, but take advantage of compromised host defences to cause invasive infection e.g. *Aspergillus fumigatus* which causes IPA. Gram-negative sepsis, due to organisms such as *E. coli*, *Klebsiella* spp. and *Enterobacter* spp. generally come from patients' endogenous gut flora and may translocate across the gut wall that is compromised by mucositis as a result of chemotherapy or GVHD. Sepsis, particularly, due to Gram negative organisms, can develop rapidly and requires prompt aggressive intervention as the associated mortality is high.

89. Bacterial prophylaxis, usually in the form of the quinolone antibiotic, ciprofloxacin (although other regimens are used), is given to certain groups of high-risk patients. The rationale is to reduce the amount of the common Gram negative organisms in the gut that are known to translocate into the bloodstream. The aim is not to achieve a therapeutic level of ciprofloxacin in blood. Allograft recipients receive ciprofloxacin orally at the onset of their conditioning regimen, before they develop neutropaenia, until engraftment and recovery of neutrophils occur. Patients with acute leukaemia will also receive prophylaxis during the period of their treatment-associated neutropaenia. There are risks associated with the use of any antibiotic, in particular, the development of resistance, and this will be monitored at unit level. All units will have their own protocols for bacterial prophylaxis based on national and international guidelines.

90. *Pneumocystis jirovecii* is a yeast-like pathogen found commonly in the environment and in the lungs of healthy people. In immunocompromised patients it may reactivate causing an aggressive pneumonia. In certain patient groups at risk, cotrimoxazole is given as prophylaxis. Some patients who are rendered functionally asplenic receive amoxicillin to prevent infections due to encapsulated bacteria such as pneumococci. Cotrimoxazole is also used to prevent *Toxoplasma gondii* infection, a protozoan parasite which can cause serious infections in certain groups of immunocompromised patients.

91. The prevention of cytomegalovirus (CMV) infection (which causes pneumonitis and retinitis in SCT recipients) is achieved by anti-CMV prophylaxis and pre-

emptive anti-CMV therapy based on monitoring viral load using molecular tests. This approach is widely used to minimise the impact of CMV infection or reactivation. Both approaches may be employed, depending upon the donor/recipient CMV status, organs transplanted, and intensity of immunosuppression.

92. Risks of infection vary for different groups of patients and the above represents a general overview of common prophylactic approaches.

93. The use of any antibiotic may be associated with interactions and side effects particularly in patients receiving multiple medications. For example, ciprofloxacin can be associated uncommonly with convulsions, tendon damage and cardiac toxicity. It has been shown to cause arthropathy in young animals, so its use is generally not recommended in children, although short term use can be justified if the benefit outweighs risk. More common side effects are *Clostridioides difficile*-associated diarrhoea, nausea, vomiting, headaches, dizziness, and sometimes hepatic and renal toxicity. While the use of ciprofloxacin as a prophylactic agent in haemato-oncology patients is established practice in many units, its use is not without controversy. Promotion of resistance is a concern, particularly in the Gram negative flora. However, its use may also select out Gram positive organisms that are resistant such as certain groups of streptococci, commonly found as part of the oral flora. Furthermore, ciprofloxacin reduces the diversity of the gut flora and this has been associated with increased transplant mortality and acute GVHD mortality in allograft recipients.

94. Antifungal prophylaxis is established practice in most haemato-oncology units. The two main invasive fungal pathogens are *Candida* spp. and *Aspergillus* spp. Other fungal species such as fusarium and the mucorales are much rarer. Aspergillus infection is of the greatest concern and is associated with a high mortality. Aspergillus spores are ubiquitous in the environment, inhaled constantly by us all, and infection probably represents reactivation in many cases.

95. Aspergillus infection remains one of the leading causes of infection related death in SCT recipients and prophylaxis is associated with significant reductions in morbidity and mortality. Candida infection is endogenously acquired, while aspergillus infection is mostly community acquired. Damp patches in ceilings or walls associated with water ingress may encourage growth either in domestic homes or hospitals, and may represent sources of infection, although this is less common. Building work can also be associated with release of bursts of aspergillus spores.

96. IFD can be very difficult to diagnose as symptoms are often non-specific leading to a delay in presentation. As a result of the high mortality associated with infection, empirical therapy is initiated often on the basis of fever unresponsive to antibiotic treatment. This results in overtreatment and significant antifungal expenditure. With the development of aspergillus PCR and tests for antigen detection, and the better availability of high-resolution CT scanning there has been a move towards a more directed therapy approach.

97. In my view, the role of HEPA filtered air is less crucial than once thought. This is based on the fact that aspergillus spores are ubiquitous and invasive infection represents reactivation in many patients; in SCT recipients, the risk of infection extends to several months (particularly if they develop GVHD), for the majority of which patients will be outside the hospital environment; changes in transplant practice, including lower intensity conditioning regimens; patients spending more time outside hospital (ambulatory transplants); the proven effectiveness of antifungal prophylaxis; and the development of biomarker monitoring allowing early confirmation or exclusion of infection.

98. Posaconazole is an extremely effective antifungal prophylaxis agent, its efficacy demonstrated in two studies published in the New England Journal of Medicine, one of which demonstrated an overall mortality benefit, and confirmed extensively in real word practice. Another member of this class of drugs, isavuconazole, has also been shown to be effective. Other drugs such as caspofungin and liposomal amphotericin (Ambisome) have potent antifungal activity and, while used mostly in treatment of infection, may occasionally be

used prophylactically. Antifungal prophylaxis is used in most SCT and haemato-oncology units each of which will have its own protocols. However, in some units, particularly in the Netherlands and Belgium, but also in the UK, a biomarker monitoring strategy is employed without the use of prophylaxis. Prophylaxis may be defined as primary in a naïve patient or secondary where the patient has been treated previously for a fungal infection and is therefore at high risk of relapse when they receive further chemotherapy. All antifungal drugs are associated with multiple toxicities and interactions and may require monitoring of serum levels. Their use can be problematic in patients receiving multiple other medications. Prior to the introduction of posaconazole, itraconazole was used as prophylaxis in SCT patients in NHSGGC. In a 2 year retrospective audit of 92 SCT patients receiving prophylaxis for up to 27 weeks post-transplant, no cases of IPA were recorded. I am less informed about prophylactic regimens in children where the pharmacokinetics/dynamics of antifungal drugs differ from adults as I have not looked after paediatric patients. However, the principles do not differ.

99. The hypotheses for routes of infection in the IMT for Ward 6A all involved contamination of patients/IV lines from the environment, principally water. It would follow that remedial actions would involve the physical prevention of contamination by splashes or aerosol generation and good practice/aseptic technique during line insertion, access and maintenance (including reducing unnecessary line manipulation). In my view, given the hypothesis that the contamination was derived from the environment, the use of ciprofloxacin prophylaxis was inappropriate. As indicated above, the rationale for the use of ciprofloxacin is to reduce the risk from endogenous sources by altering the nature of gut microbiome, reducing the load of potentially pathogenic bacteria that may translocate. The aim is not to achieve treatment levels of antibiotic in the blood. In this situation the use of ciprofloxacin prophylaxis is counterintuitive, and would not, in my view, prevent infection derived from the environment. It may, however, encourage superinfection with resistant bacteria. Ciprofloxacin is not without side effects and there is reference in the IMT minutes of physicians' concerns that children were experiencing diarrhoea, nausea, and vomiting. (**A41890723 – 78. IMT GNB Ward 6A - Bundle 1, page 348**)

100. I was not involved in any of the IMT meetings managing the two cryptococcal infections. While the two cases of cryptococcus infection were unusual, sporadic cases of infection occur. In the last 10 years there have been 15 cases of cryptococcal infection diagnosed across all sites in NHSGGC, including 3 over a short period. The two cases in QEUH/RHC were immunocompromised patients. One case had visited Florida a few weeks previously and the other had been in a different hospital for over two weeks prior to transfer to the QEUH and was positive within two weeks of admission. The incubation period of cryptococcus is unclear but is thought to be several weeks to months and may represent reactivation in compromised individuals, similar to aspergillus infection. The concept of dormancy and revival under favourable conditions has been validated in *C. neoformans* from both epidemiological and genotyping data. In my view, given the probable incubation period and other factors, the hypothesis of airborne spread of cryptococcus organisms derived from pigeon guano via the ventilation system is improbable. So far as I am aware, the presence of pigeons and other vermin in plant rooms is not uncommon, but I cannot think of a physical mechanism by which cryptococcus organisms could find their way into a sealed ventilation system. In the QEUH there are scores of haemato-oncology, SCT and solid organ transplant patients, and other patients receiving high-dose steroids and immunomodulatory agents for many different conditions who would be susceptible to respiratory infection. If the hypothesis is that *Cryptococcus neoformans* is being spread throughout the hospital *via* the ventilation system, one would expect to see many more cases.

101. In my view, the use of Ambisome (liposomal amphotericin) prophylaxis was unwarranted. WHO guidance for prevention of cryptococcus infection in HIV positive individuals recommends cryptococcal antigen screening and pre-emptive therapy in antigen positive individuals or, if antigen screening is not available, the use of fluconazole prophylaxis. There are rare exceptions where azole drugs may be contraindicated in haemato-oncology patients. Regrettably, it is recorded in the IMT minutes that two children developed anaphylactic reactions following administration of Ambisome. **(A36690566 – 10. IMT Minutes Water Incident Ward 2A RHC - Bundle 1, page 255).**

102. In my experience, the use of prophylaxis is always explained to patients. In haemato-oncology patients and in other settings where prophylaxis is used e.g. surgical prophylaxis, there are strict evidence-based protocols to follow. I did not participate in the decisions to give prophylaxis to Ward 6A patients or following the cryptococcus infections.

Hospital Acquired Infection Reporting

103. I had no involvement in Hospital Acquired Infection (HAI) reporting, either as HoS or as Coordinating ICD. There are long standing surveillance protocols for the collection and reporting of HAI across the Board with appropriate feedback at unit/ward level and to infection control and governance committees.

104. I am not an expert in the use of Statistical Process Chart (SPC) methodology. They represent an effective tool and are used by IPC to identify areas of concern. I think SPC charts were first employed in Glasgow in the mid 1990's. The background rate is assessed by looking retrospectively at a series of data points e.g. a minimum of twenty-five, and the upper and lower control limits are applied by calculating standard deviations. The methodology is more useful in bigger units with larger data sets e.g. *Clostridioides difficile* infection, *Staphylococcus aureus* bacteraemias, *E. coli* bacteraemia's and catheter associated urinary tract infections (UTIs). It has its limitations, and it is less useful in smaller units or where few infections occur e.g. aspergillus infections in a SCT unit.

105. Insofar as how clusters of organisms are identified and other standard definitions, this is described in the NIPCM. Identification of a single case of an unusual organism e.g. an extremely resistant Gram negative organism may give cause for concern. If a cluster of organisms causing infection that all look the same (e.g. by antibiotic sensitivity) is observed in time and place, highly discriminatory typing methods are available to further determine relatedness. Alternatively, surveillance may detect a series of *S. aureus* wound infections over a short period all related to a single unit or surgeon.

106. I have no knowledge of the database for microbiological typing results. Before I retired, I had no reason to be concerned about the way typing results were recorded.

Concerns About Infection

107. I did not have any concerns about amounts, locations, clusters, or types of infection within the hospital. I was aware that there were issues and incidents that had occurred. For example, I knew there was an issue with water, but I did not know the detail. I was aware of the two cryptococcus infections although I was not involved in the IMTs. I only knew vaguely about the issues in Ward 6A prior to becoming involved towards the end of the IMT process. All these issues, centred on the QEUH, were managed by IPC. I am aware that the infection rates in the QEUH and across NHSGGC are very encouraging and compare very favourably with any other comparable centres in Scotland. As I commented earlier in this statement, despite our very best efforts at prevention, sporadic increases in infection rates and outbreaks of infection will occur from time to time in all hospitals. What matters is having surveillance systems to identify these promptly and robust structures in place to investigate and institute any remedial actions required to control them. I had every confidence in the ability of NHSGGC to perform these functions.

108. I did not observe any increased risk of infection, in relation to exposure to pathogens in the water supply or ventilation system, which impacted my practice. As indicated, I was aware that there were issues and concerns, but not the detail, as these would be addressed by IPC. It is not unreasonable to question the numbers of air changes per hour in the single hospital rooms (i.e. three versus six) but as indicated earlier it's not a linear relationship. The important factor is to use surveillance tools to monitor and determine if indeed this is associated with an increase in infections. Given the infection rates in the QEUH, in my opinion this is not an issue. Equally, while I am not an expert in chilled beam technology, as a Consultant Microbiologist, I am not aware of evidence suggesting they pose an infection risk. I was aware of the

cryptococcus incident and the issues regarding Ward 6A and had a more detailed knowledge of the issues around ward 4B. I was also aware of concerns over negative pressure rooms for isolation, but I knew that pathways for the management of potentially infectious patients had been established.

109. I have complete faith in the structures in NHSGGC for surveillance of infection, elucidation of epidemiology and for raising concerns.

Incidence of Hospital Acquired Infections from 2015 to early 2018

110. I did not have any input at the time, in relation to any of the emerging concerns. I was present at the October 2017 meeting with the SMT. I attended two of the Ward 6A IMTs towards the end of the process and I was aware of issues with the water but had little knowledge of the detail prior to that. My clinical practice was restricted to the North sector, based in GRI and I covered the SCT unit in the Beatson/QEUH.

Water Issues

111. I did not have any involvement in the concerns involving water in the QEUH. I was aware that there were issues around the water, but not the nature of these. IPC would have had oversight of any issues regarding water. Part of my role as HoS was to provide resource for the water testing, which was carried out at GRI. This did not require any input from myself. I understand that routine water testing is performed in line with requirements.

112. The proximity of the sewage plant to the hospital does not, in my view, constitute a risk to patient safety. These represent two physically unconnected entities and any suggestion that this represents a risk is without merit.

Decision to close Wards 2A/2B and move to Wards 6A and 4B

113. I did not draft the report on the Management of Infection Control incidents in Wards 2A/RHC during 2017. I think the report was produced by Sandra Devine and the IPC team. I have read the report and it demonstrates the very considerable amount of work that members of the IPC team and other staff were doing proactively and how they were addressing issues effectively as they arose.

114. I was not involved in either of the incidents in Ward 2A and 2B in 2018 or the decision to close Wards 2A/2B and move to Wards 6A and 4B.

Incidence of HAIs on Ward 6A

115. I became involved in the Ward 6A IMT in September 2019 attending two IMT meetings on 13 and 18 September 2019. **(A36591627 – IMT Gram Negative Blood Ward 6A - 13 September 2019 - Bundle 1, page 360) (A36591629 – IMT Gram Negative Blood Ward 6A - 18 September 2019 - Bundle 1, page 365)** As already indicated, prior to that time I had only a peripheral awareness of the issues. My knowledge of the events and of the behaviours that were exhibited during these meetings was obtained only via subsequent conversations. I was not involved in the decision to replace Dr Inkster as Chair of the IMT. I was phoned by Dr Green, Chief of Medicine for Diagnostics, who asked me if I would take on the role as Chair. Following reflection, I declined as I was within a few weeks of retirement and I thought the environment was simply too toxic.

116. There were disagreements about the safety and possible reopening of Ward 6A. I only attended two meetings, but it quickly became apparent that discussions were being held outwith the IMT setting and as a result of this the paediatric haemato-oncology physicians were being given conflicting microbiological advice. That is emphasised by Dr Ritchie in her comment recorded in the minutes from 18 September 2019 in which she describes an

impasse with clinicians being given two microbiological opinions. (**A36591629 - 18.09.2019 – IMT Gram Negative Blood Ward 6A - Bundle 1, page 365).** To interfere with the formal management and governance role of an IMT represents unprofessional behaviour, is a recipe for chaos, and does not contribute to patient safety. There are proper routes for individuals to escalate concerns. The paediatric haemato-oncology physicians were being briefed behind the back of the IMT which created significant difficulties in managing the issues.

117. I have read the minutes of earlier IMT meetings and looked at the cases based on which the IMT was convened. While the cases all fulfilled the definition of healthcare associated infections several of the cases had spent long periods outwith the RHC environment and had also received care in other hospitals illustrating the complexities inherent in such investigations. Prof Leanord and I reached the conclusion that the pattern of the organisms that were observed were not unique to Ward 6A, all the organisms having been identified previously in the Royal Hospital for Sick Children (RHSC) based at Yorkhill. It is not uncommon to see the same patterns of organisms (the microbiological microflora) following a move to a new unit. When the neonatal intensive care unit (NICU) in Rottenrow Hospital moved to the Princess Royal Maternity Hospital in 2001, we isolated the same patterns of organisms.

118. I was not involved in the CLABSI study, but I do remember the CLABSI rate, which is measured using standard methodology, was comparable to that recorded in Great Ormond Street Hospital and in Cincinnati Children's Hospital which is widely regarded as the gold standard. Jennifer Rogers, the Chief Nurse in Paediatrics at the time, had undertaken a quality improvement exercise involving a considerable amount of work designed to reduce CLABSI rates. As a result of these interventions, the rates had fallen significantly. It is not unusual to see line-associated infection rates creeping up in the same way as you might see an increase in *S. aureus* bacteraemia rates or *C. difficile* infection rates in any hospital. What matters is to have surveillance processes in place to identify these in good time, investigate the causes and make evidence-based interventions to address the problem.

119. The types of organisms isolated were similar to those seen in RHSC (e.g. Elizabethkingia) and, despite extensive sampling, no links could be demonstrated between patient isolates and the environment. The HPS report *Review of NHSGG&C paediatric haemato-oncology data* noted that the data available did not provide evidence of a single point of exposure. The same report concluded that, in the year following the move to the QEUH (October 2018 to September 2019), compared to other hospitals in Aberdeen and Edinburgh, there was no difference in the rate of positive blood cultures for Gram negative organisms in total or broken down into environmental or environmental/enteric subgroups. The rate for positive blood cultures due to Gram positive organisms was lower in NHS GGC (probably reflecting the work by Jennifer Rodgers' team). Prof Leanord also analysed the enterobacter isolates from blood cultures from RHC patients including the 3 from 2019 and was able to demonstrate no commonality between patients; all cases were sporadic with no cluster association between them, and no genetic linkage between all the enterobacter isolates within the whole of NHSGGC.

120. A combination of factors led Dr Iain Kennedy, Prof Leanord and myself to conclude that Ward 6A was microbiologically safe. Dr Kennedy, Consultant in Public Health Medicine, had prepared an EPI curve report (a visual display of the onset of illness among cases associated with an outbreak) of Gram negative bacteraemias in paediatric haemato-oncology patients from July 2013 to July 2019, divided into environmental and non-environmental organisms. This covered the period pre- and post- the move from RHSC to the new RHC. The curve demonstrated that following the move to Ward 6A the rates of environmental gram negative bacteraemias were similar to those seen in RHSC with a clearly improving trend. The pattern of organisms isolated was not unique to Ward 6A having been seen in RHSC before. A reduction in the CLABSI rates to levels comparable with other units in Aberdeen and Edinburgh was demonstrated. No links between patient isolates and the environment, including the chilled beams, had been demonstrated. Taken together, this evidence suggested to me and my colleagues that the ward was microbiologically safe. Furthermore, the risk of continued closure of the ward to admissions, with complex care being provided in units some distances away, had to be

considered. This recommendation was accepted by the IMT on 13 September 2019 and subsequently vindicated by the reduced rate of Gram negative bacteraemias on the ward**. (A36591627 – IMT Gram Negative Blood Ward 6A - 13 September 2019 - Bundle 1, page 360)** I attended one further IMT on 18 September 2019 where Dr Ritchie commented on the existence of two sets of microbiological opinion. **(A36591629 – IMT Gram Negative Blood Ward 6A - 18 September 2019 - Bundle 1, page 365).** In my view this served only to sow confusion and it was some time later that the ward was finally reopened.

121. While the case definition included bloodstream infection (BSI) due to an environmental organism, I note that *Klebsiella* spp. and *Enterobacter* spp. were included in an "enteric/environmental" category. I would question the appropriateness of this category. *Klebsiella* spp. and *Enterobacter* spp. form part of the normal mammalian gut flora. All the common enteric Gram negative organisms, including the most abundant, *E. coli*, may survive for variable periods in the environment. Invasive infections with these organisms may be endogenous in aetiology, although cross infection from other individuals or the environment may occur. Inclusion of *Klebsiella* spp. and *Enterobacter* spp. in this hybrid category, particularly in the absence of evidence of an environmental source or of cross contamination between patients, may erroneously inflate the true rate of BSI due to environmental organisms.

122. I did not carry out an analysis of gram-negative bacteria as recorded in the minutes of the IMT meeting on 6 September 2019. **(A36591637 – 06.09.2019 – IMT Gram Negative Blood Ward 6A - Bundle 1, page 354).** This may refer to an analysis, *Review of NHS GGC paediatric haemato-oncology data*, produced by HPS.

123. I have been involved in many IMTs during my career in NHSGGC and elsewhere. As far as NHSGGC is concerned I have always found that IMTs were properly constituted, with appropriate representation and expertise. Proper process was always followed in the meetings I attended, with full discussion of the issues, circulation of minutes, communication of decisions and issuing of public statements. I am not aware of any evidence that would suggest

that there was any deficiency in the governance surrounding IMTs or their effectiveness when it came to escalating incidents. Evidence is considered and reasonable hypotheses developed with the understanding that, as new evidence is uncovered, the hypotheses may be reviewed. Ultimately, remedial actions are taken based on the evidence, and on the understanding that the source may never be found and that no single intervention may be identified as definitive.

124. I have chaired IMTs investigating outbreaks of infection associated with significant morbidity and mortality. For example, an outbreak of *Salmonella hadar* infection affecting mothers and babies in Rottenrow Maternity Hospital where the source was never identified, no remedial action shown to be definitive and during which closure of the entire hospital was discussed. Another involved an outbreak of *Serratia marsescens* BSIs associated with several neonatal deaths where contaminated laryngoscope blades and a breast milk pump were identified as the sources. Both outbreaks are examples of how difficult these situations can be to manage, requiring multidisciplinary input and with multiple hypotheses considered.

125. Major outbreaks are resource intensive often involving multiple participants with differing expertise. The role of an IMT committee is to identify the problem, examine the evidence, develop reasonable hypotheses, determine solutions and instigate remedial actions that are proportionate to the nature of the problem. It is essential that a committee works in a collaborative, respectful manner, where all views are discussed. Often, given differing opinions, reaching decisions may require compromise in order to determine an agreed way forward. Failure to do so is a recipe for confusion and is not in the best interests of patient safety. Fortunately, serious disagreements are rare, and I have never witnessed conflict. I have witnessed disagreement, but not conflict in the way the Ward 6A IMT has been described. I have only second-hand reports of what happened in the Ward 6A IMTs before I joined, but I am aware of an unwillingness to consider dissenting opinion, disruptive behaviour and lack of respect for colleagues exhibited by some individuals.

126. There is a process for IMT escalation. I do not know exactly what it comprises, but I would know who to ask. I have never been involved in such a situation but that appears to have been required in the Ward 6A IMT committee. I was asked but declined to Chair it, and the Deputy Director of Public Health assumed the role. If I was ever involved in such a situation it would, in my view, be appropriate to discuss with the Infection Control Manager and a Senior Medical Manager. I think such steps would very rarely be required.

127. In terms of developing complex hypotheses, IMT committees can sometimes be presented with very little evidence, or, alternatively, a bewildering array of information. This can make for a very high-pressure situation but the evidence needs to be considered carefully and reasonable hypotheses developed. These may change over time as the outbreak investigations progress with some evidence discounted and new evidence uncovered. It is crucial however, that any hypotheses pass the test of reasonableness. They should be based on the available evidence, and, very importantly, not on preconception.

128. The proposition of any hypothesis is acceptable so long as it is reasonable, but the burden of proof lies with the proposer who must demonstrate evidence to support their view. The onus does not lie with others to disprove the hypothesis. A theory remains a theory, until it is proven. That is particularly relevant here; in almost ten years whole generation sequencing (WGS), which is the most discriminatory typing method available, has demonstrated links between clinical cases and the hospital environment in only two paediatric haemato-oncology patients. I note in the minutes of the Ward 6A IMT meeting on 14 August 2019 that Dr Inkster draws attention to the low sensitivity of environmental screening and expresses concern that too much emphasis is being placed on negative results. This appears to imply that if you do not find a link, you are not looking hard enough. How much screening is enough? Why do environmental screening at all?

129. Lower sensitivity can, to a large extent, be offset by increasing the sample size. I understand NHSGGC have processed several thousand water and other environmental samples over a few years. Hundreds of environmental isolates

have been typed by WGS and no links to patients have been demonstrated. As Professor Tom Evans has stated, with that number of samples screened, failure to demonstrate a link effectively means there is no link.

130. I am aware that the expression “absence of evidence does not mean evidence of absence” has been used. I think the use of this phrase is unhelpful. What counts as evidence of absence is controversial and has been a source of debate between scientists and philosophers. The phrase is used to describe how it is effectively impossible to prove a negative i.e. that something doesn’t exist. However, some things, such as in this case, links to the environment, can still be regarded as highly unlikely. Bertrand Russell, the Nobel Prize winning philosopher and mathematician, used the example of a ‘cosmic teapot’ to illustrate the point. He stated that, even though it could not be refuted, no one should believe him if he claimed, without proof, that a tiny teapot was orbiting the sun between Earth and Mars.

131. The idea that a theory holds true because it cannot be disproved makes a mockery of scientific method and sets a dangerous precedent. It allows the proposal of any theory, particularly one that does not pass the test of reasonableness, because it cannot be disproved. Propose a theory often enough and loud enough, it begins to become accepted wisdom. This has the potential to create significant difficulties in management of outbreaks and delivery of IPC services.

Communication and Whistleblowing

132. I was not directly involved in discussions about the communication of potential environment risks. However, I am aware that communication is a standing item on all IMT agendas.

133. All doctors should be aware of the General Medical Council (GMC) mandated professional duty of candour. When mistakes are made it is accepted policy to inform patients of the nature of the error and why it occurred (once known), apologise, explain the immediate and long-term effects (if any) and offer

appropriate remedial actions. There is separate Scottish guidance on duty of candour and there is also NHSGGC organisational guidance. It also forms part of undergraduate medical training.

134. In general, I have no concerns about wrongdoing, failures, or inadequacies in NHSGGC. NHSGGC is a very large organisation with robust governance structures. In any large organisation there is always the capacity for mistakes to be made; there may be failures of communication on occasion. I have confidence in the mechanisms available for expressing concerns. However, in terms of overall governance, I have never witnessed anything that has given me cause for concern. On a personal level, my family have used the service and I have only praise for the staff and the facilities. I have no doubt that delivering the best medical care and patient safety are the paramount concerns of all staff.

135. I am unaware of deficiencies in the design, building or commissioning of the QEUH and RHC buildings. On the available evidence, I have no concerns regarding infection rates which are in keeping with, if not better than, comparable institutions. However, I am concerned at the loss of trust in NHSGGC that has resulted. I am dismayed at the behaviour of several individuals who have caused significant distress and done a serious disservice to microbiology, NHSGGC, the wider NHS in Scotland and, most importantly, to patients.

CLOSING COMMENTS

136. I believe that the facts stated in this witness statement are true, that this statement may form part of the evidence before the Inquiry and be published on the Inquiry's website.

SCOTTISH HOSPITALS INQUIRY

Bundle of documents for Oral hearings commencing from 19 August 2024 in relation to the Queen Elizabeth University Hospital and the Royal Hospital for Children, Glasgow

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