

Scottish Hospitals Inquiry

Witness Statement of

Dr James Walker

WITNESS DETAILS

1. My name is James Taggart Walker. My occupation is as a public health microbiologist.
2. This statement is specifically in relation to the meeting that took place at Queen Elizabeth University Hospital (QEUH) on site on, 5 June 2014, which was entitled the “Special Meeting held in the Labs FM Block- at the South Glasgow Hospital to discuss and resolve issues with Optitherm taps installed in the Hospital.”

BACKGROUND

3. I worked for Public Health England as a public health microbiologist for approximately thirty years. During that time, I attended various training events and society conferences.
4. I was a member of the Public Health England Biosafety team in 2012 operating as a public health senior research microbiologist, investigating the infection outbreaks in various hospitals in Northern Ireland [December 2011/April 2012 and intermittently until the publication of the **(DHSC Health Technical Memorandum, HTM 04-01: Safe Water in Health care Premises. Part C: Pseudomonas Aeruginosa – Advice for Augmented Care Units)** and scientifically peer reviewed manuscript namely **(JT Walker and others. Investigation of Healthcare-Acquired Infections Associated with Pseudomonas Aeruginosa Biofilms in Taps in Neonatal Units in Northern**

Ireland (2014) 86 J Hosp infect 16) in relation to microorganisms focusing on *Pseudomonas aeruginosa*. Other reports were produced following investigations by other teams of experts (**RQIA Independent Review of Incidents of Pseudomonas Aeruginosa Infection in Neonatal Units in Northern Ireland – Interim Report – 31 May 2012 – Bundle 18 – Volume 2 of 2 – Document 85**) which concluded that the outbreaks of infection of *Pseudomonas aeruginosa*, which occurred in the neonatal units at Altnagelvin and Royal Jubilee Maternity Hospitals, were linked to contaminated tap water in the intensive care rooms of the units.

5. The main conclusion that we drew from this exercise was that the potential for microorganisms in the built environment to cause infections in patients was underestimated. We have learned over the years that the risks from the built environment, including from the air, the water and various surfaces are important especially in relation to those individuals who are immunocompromised.
6. Some individuals from Public Health England were invited by the Department of Health to become part of a guidance writing team [2012 through to 2014] in order to provide a new document regarding the risk of *Pseudomonas aeruginosa* in augmented care units. I was on that panel. There would also have been representatives from the devolved nations. I cannot remember exactly who was involved in this guidance writing team, but there were a wide range of expert participants.
7. We wrote that guidance in relation to taps covering many aspects of tap engineering, including the components of the taps, and also making recommendations as to the fitting/removal of components in relation to safety of the water (**DHSC Health Technical Memorandum, HTM 04-01: Safe Water in Health care Premises. Part C: Pseudomonas Aeruginosa – Advice for Augmented Care Units**).
8. Since I ceased working for Public Health England in 2019, I have started a small consultancy, Walker on Water in the same year. In this capacity I currently work for one other client. I also occasionally consult with water companies and

hospitals. My main focus at the current time is my work as an expert with the Scottish Hospitals Inquiry.

9. I was the Chair of the Central Sterilisation Club (2021 – 2024) and am a Fellow of the Royal Society of Public Health, and a member of the Water Safety Management Society and HealthCare Infection Society.

Involvement with the QEUH and the meeting 5 June 2014

10. Prior to attending the meeting in question, I had had no direct involvement in any capacity with the Queen Elizabeth University Hospital (QEUH) or with any of its staff members related to the water system at QEUH.

11. I first became involved with the QEUH in June 2014 when I was working for Public Health England shortly after we had been involved in investigating a number of outbreaks including those in Northern Ireland associated with water system components.

12. Public Health England was at that time [2012-2014] in the process of working with the Department of Health in writing guidance, (**DHSC Health Technical Memorandum, HTM 04-01: Safe Water in Health care Premises. Part C: Pseudomonas Aeruginosa – Advice for Augmented Care Units**) as mentioned above.

13. I was invited to attend the meeting at the QEUH by way of an email in order to provide information as a Public Health England representative in relation to our experiences and learning in the context of our investigations in respect of the above-mentioned Northern Ireland infection outbreaks. I cannot remember who it was that sent me the initial invitation to speak at the relevant meeting at the QEUH.

14. Public Health England had been involved in the Northern Ireland hospital infection outbreaks from a very early stage [December 2011/ January 2012)], both in providing advice and as well as conducting investigations in using its research

and scientific laboratory capabilities to assess a large number of plumbing components removed from the hospitals' water distribution systems under what might be described as almost forensic conditions.

15. The meeting in question was held in the Laboratory FM Block at the South Glasgow Hospital on the QEUH site. In attendance at the meeting were representatives from the NHS GGC Departments of Estates, Infection Control, and senior Management as listed on the meeting minutes. The meeting was chaired by Ian Stewart of Health Facilities Scotland. In attendance were Lisa Richie (HPS); Paul Southworth (HPS); Alan Gallagher (NHS GGC); Ian Powrie (NHS GGC); Jim McFadden (JMCF); Jim McFadden (NHE); Gerry Cox (Golden Jubilee Hospital); Iain McNally (NHS Ayrshire & Arran); Jimmy Walker (PHE); Ian Storrar (HFS); Angus Horne (Horne Engineering Ltd); and John Horne (Horne Engineering Ltd). Apologies received from Eddie McLaughlan and Geraldine O'Brien. There was no affiliation for Eddie McLaughlan and Geraldine O'Brien in the minutes of the meeting. These were the types of people you would expect to find in a water safety group.

16. I had been invited to the meeting as a representative of Public Health England to share information and learning at QEUH with staff in respect of PHE's involvement in the Northern Ireland hospital infection outbreaks and investigations (**JT Walker and others, 'Investigation of Healthcare-Acquired Infections Associated with P. Aeruginosa Biofilms in Taps in Neonatal Units in Northern Ireland' (2014) 86 JHI 16.**) This was particularly relevant in respect of the Optitherm Horne taps that contained plastic outlets that had already been procured for use by NHS GGC. The duration of the meeting was approximately two hours.

17. At that meeting I gave a Power Point presentation in relation to our investigations into contamination of plumbing components found in a wide range of different taps across a number of hospitals in Northern Ireland. I explained that the investigations, which I was personally involved in conducting, included the microscopic visualisation of microorganisms found on the surfaces of many different water system components as well as the microbiological recovery of live

organisms for enumeration and typing. I also provided background information about *Pseudomonas aeruginosa* – which the investigation team found to be growing on the plumbing components under investigation. I described the investigation team as having a background knowledge of microbiology and plumbing components (though the latter to a lesser extent), and how it was established that particular structures were found to be positive for microorganisms from inlet components (strainers) to outlet components (flow straighteners) of various water system structures. I also discussed the implications of the plumbing components testing positive for microorganisms which had infected the patients as *P. aeruginosa* isolates recovered from tap biofilm from three taps at one hospital had VNTR (Variable Number Tandem Repeat) profiles, which are techniques used to compare isolates from water and patients, that were typed as being indistinguishable from the strain found in both patients and tap water from that hospital (**JT Walker and others, 'Investigation of Healthcare-Acquired Infections Associated with *P. Aeruginosa* Biofilms in Taps in Neonatal Units in Northern Ireland' (2014) 86 JHI 16.**). In particular how organisms which had been identified on such components had been shown to relate specifically to those organisms recovered from patients.

18. It was very clear to me, and the investigation team, that the taps and the contaminated water were the most likely exposure route and transmission risk to the children in the hospitals in Northern Ireland, and this is what I wanted to get across to the team in Scotland.

19. I gave my presentation based on my experience as a water microbiologist and a biofilm expert of 25 – 30 years standing. The findings were that a number of tap outlet fittings which had a large surface area to volume ratios. were heavily contaminated with microbial organisms that were typed as being indistinguishable from the clinical strains. It was striking how much material (biofilm) was attached to the components. Such microbial colonisation would present an infection risk to patients if the risk were not monitored and effectively managed.

20. Inside the taps on the metal components there can sometimes be quite rough areas. The rough areas can become filled with debris. The rougher the area is

the more debris can become attached. Prior to the water coming into a tap there is a component called a strainer (which is a little mesh). The mesh is there to protect the water quality. However, debris and particulate matter in the water system will attach to that mesh and biofilm can build up on the strainer and thereby contaminate the rest of the tap. Further, people washing their hands which may be contaminated from a variety of sources may then contaminate the outlet tap components. This is made possible by the components having large surface areas to volume ratios which encourages microbial growth.

21. After I had given my presentation Angus and John Horne of Horne Engineering Ltd (the sole provider of taps to the Hospital) gave a presentation in relation to its taps which had already been procured by the QEUH and which had been engineered to prevent microbial contamination. They used videos and smoke graphics to demonstrate how they believed that Horne tap components would not become contaminated in use i.e. if the tap was full of water the smoke would not enter the tap outlet fitting. They likened the smoke to air containing bacteria i.e. if the air could not enter the tap, then neither could the bacteria. They used videos and smoke graphics to demonstrate how they believed that Horne tap components would not become contaminated in use. That is, if the tap outlet was full of water, then smoke would not enter the tap outlet fitting. Conversely if the tap outlet did not contain water, then the smoke would enter the tap body and hence contaminate the tap body. They also explained how the outlet fittings in their taps would be less likely to become contaminated because of the nature and design of the mesh material and due to the retention of water within in the spout of the tap i.e. they believed they had designed a tap and outlet fitting that would not become contaminated with waterborne pathogens but were not able to provide any microbiological evidence from laboratory studies to support these claims.

22. Such companies often have their own hypotheses based on their own engineering and design without having carried out a microbiological study. I could not see any evidence of scientific reasoning to why the Horne taps in question with the large surface area to volume ratio of their outlet fittings would not become microbiologically contaminated.

Outcome and Decision

23. My task as an external expert in this field (water microbiology and biofilms) was to explain the risks associated with tap components in the context of what we had learned during our investigations of the hospitals in Northern Ireland, and in particular the extremely high risks posed in relation to immunocompromised groups of patients (**JT Walker and others, 'Investigation of Healthcare-Acquired Infections Associated with P. Aeruginosa Biofilms in Taps in Neonatal Units in Northern Ireland' (2014) 86 JHI 16. (DHSC Health Technical Memorandum, HTM 04-01: Safe Water in Health care Premises. Part C: Pseudomonas Aeruginosa – Advice for Augmented Care Units) (Jacqui Wise, Three Babies Die in Pseudomonas Outbreak in Belfast at Neonatal Unit (2012) 344 BMJ e5920) (RQIA Independent Review of Incidents of Pseudomonas Aeruginosa Infection in Neonatal Units in Northern Ireland – Interim Report – 31 May 2012 – Bundle 18 – Volume 2 of 2 – Document 85)** My ultimate advice was to remove the outlet components from the taps in the wards accommodating immunocompromised patients who are particularly vulnerable to infection.

24. In the light of my presentation and that of Horne Engineering's, a decision had to be made as to whether or not use the Horne taps that had been procured for the whole of the Hospital, and if so where they should and should not be used. Various options were considered during the course of the meeting. They were 1. to fit the taps as procured (even though it had been concluded during the NI investigations that such taps with large surface area to volume ratios readily accumulated microbiologically contaminating material (biofilm) in the absence of proper maintenance, 2. to fit the taps in the Hospital and remove the outlet fittings or 3. to purchase new taps for the wards/rooms that accommodated clinically vulnerable/immunocompromised patients only.

25. The attendees unanimously agreed at the meeting that they would proceed with taps as fitted/to be fitted as purchased.

26. "That unanimous decision was based on earlier guidance (Scottish Health Technical Memorandum 04-01: The control of Legionella, hygiene, 'safe' hot water, cold water and drinking water systems Part A: Design, installation and testing 2008) i.e. the taps that had been installed within the new build development had complied with guidance at the time of its specification and briefing and that as the hospital was in the process of being commissioned it should be regarded as being in the "retrospective" category, and not "new build". Therefore, those representing NHS GGC decided that the guidance in the Scottish Health Technical Memorandum 04-01: Water safety for healthcare premises Part A: Design, installation and testing 2014 i.e. "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" did not apply in these circumstances".

27. I know from my own perspective I felt disappointed with that decision. Following discussion those present took the decision that (i) the taps would stay in place and (ii) that risk assessments based on commissioning procedures, operational management, seasonal influences and personnel involved may reduce the risk of *P. aeruginosa* contamination and patient infections and that this risk assessment strategy would be sufficient to protect patients. I just felt that they had not taken on board the risk to patients. My whole reason for attending the meeting was to present the background work that we had carried out in Northern Ireland in connection with the infection outbreaks and infant deaths (which were publicised widely) and to explain the above-mentioned Department of Health England guidance in the context of risk to patients and users. This guidance is universally applicable and is not simply confined to any one country in the same way that outbreaks can occur widely across countries.

28. I was left sitting in the position thinking that I was not sure that I had done my job well enough here for them to appreciate the risk of these components to people who were going to be in these hospitals.

29. Emails of a general nature were exchanged between myself and various individual staff members in relation to potential contamination risks, but I cannot remember whether these were sent before or after the meeting. I cannot confirm any details of any of these emails as I no longer have access to my PHE emails.
30. It seemed to me that the overall understanding by the attendees was that there would not be a microbial risk in respect of installing the Horne taps as they seemed to believe that any inherent risk could be managed. I was not sure that there was an understanding of the microbial risk of the water to the patient had actually been accepted by the attendees.
31. The unanimous decision to accept the use of the taps for the Hospital in question was my disappointing 'take away' from the meeting.
32. Here we are today eleven years post the Northern Ireland investigations and multiple publications demonstrating water microbiology associated with taps, and outlet fitting as being an issue in terms of infections and patient fatalities.
33. My ultimate advice was given through my presentation. It was the responsibility of the attendees to take forward their decision as they saw fit in the light of the information provided to them.
34. The cost in relation to the taps was not considered during the course of the meeting.
35. I cannot remember precisely how the decision to use the taps was arrived at, but the decision was made at the meeting there and then, taken forward by the Chair.
36. Having presented on what I thought the real microbial risks were in relation to the tap components and in the context of the lack evidence from the Horne company, it was, I thought, an unusual way to make such a decision. At the end of the day the attendees made that decision to base patient safety on risk assessments

during that meeting and had their own reasons for doing so. I was not party to those reasons - financial or contractual.

37. 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.