



Debates in Infection Prevention

Subspecialisation within infection prevention and control: the argument in favour

Michael Weinbren^{a,*}, Teresa Inkster^b

^a Department of Microbiology, King's Mill Hospital, Sutton-in-Ashfield, UK

^b Department of Microbiology, Queen Elizabeth University, Hospital, Glasgow, UK

ARTICLE INFO

Article history:

Received 25 May 2021

Accepted 29 September 2021

Available online 6 October 2021



Infection prevention and control of healthcare settings is increasingly complex, therefore IPC practitioners should routinely sub-specialise to develop expertise in smaller topic areas (for example, water safety, ventilation, surveillance, decontamination): the argument in favour.

Recent issues in two Scottish new build hospitals have highlighted the requirement for experienced Infection Control Doctors (ICD) and/or Microbiologists to be part of the design and construction team from the outset [1,2]. Issues with ventilation and water systems in these new builds have led to an ongoing public enquiry and legal proceedings with many of the identified issues being preventable [3]. COVID-19 has further highlighted the importance of ventilation, decontamination, appropriate PPE use and the requirement for infection control teams to have detailed knowledge in these areas (alongside experience of building local relationships).

Built environment problems in relation to new build hospitals are not new. The issues with infection control and new builds was recognised and raised by Jane Stockley *et al.* in 2005 in relation to the first wave of PFI newbuilds [4]. This paper identified many significant problems which needed to be addressed. Subsequent to this, the publication of HTM 04 – 01 (2013) placed significant responsibility on infection control teams for water safety [5]. Since 2013 there has also been

increasing recognition of the role of wastewater in the transmission of highly antibiotic resistant organisms.

As infection control specialists (with appropriate training and experience) we have much to offer to improve the standard of new build healthcare premises, subsequent patient care and antibiotic usage. England is about to embark on a new hospital build programme. This is a major concern, coming so soon after the new Liverpool hospital and the Scottish new build hospitals, as any proposed changes to the healthcare construction industry will not have filtered through to practice.

There is an expectation that infection control specialists have a very broad and deep knowledge base. Such expectations then become embedded within guidelines/guidance. However, infection control personnel have not been adequately trained in the built environment (let alone for a new build which is perceived as a 'once in a lifetime/career' opportunity). Most of the learning in the built environment is reactive and in relation to incidents in existing premises or around a new hospital build. Issues relating to the latter are rarely disseminated so it is not uncommon to see the same issues from one new build to the next. HTM 04 – 01 laid responsibility for water safety with infection control (amongst other staff groups) within hospitals but without ensuring training was available. Some infection control staff attend short ventilation or water training courses, these are no substitute for competency-based training, which the HSE emphasises should be attained. Compare this with the German model for training of a 'Hygienist' (equivalent of our ICD), which is a post graduate apprenticeship working under supervision of an existing Hygienist to develop the necessary skills relating to the built environment. UK training might be said to be semi-professional at best.

Although Kohn highlighted the risks of transmission of *Pseudomonas aeruginosa* (PA) by water in 1967 [6], this only became an accepted route of transmission following the neonatal incident in Belfast (2012). For the microbiology folklore that organisms went from the patient to the sink and not vice versa to have persisted so long required an ally; the inability to reliably detect transmission of sensitive strains of PA. This is

* Corresponding author. Address: Department of Microbiology, King's Mill Hospital, Sutton-in-Ashfield, NG17 4JL, UK. Tel.: +44 (0) 16236225156.

E-mail address: michael.weinbren@nhs.scot (M. Weinbren).



Figure 1. Image of a prep room showing a sink which is very difficult to access for hand hygiene. The area around the sink is very cluttered with splash risk evident to blue trays, medicine vials, gloves etc.

borne out by more recent whole genome sequencing publications showing ongoing transmission in hospitals [7]. As the name implies, IPCTs should be proactive in preventing these exogenous infections. With water/drainage systems a lack of robust surveillance has held back the impetus for development of the necessary preventative systems. For those who have been trained the risks can be glaringly obvious (see [Figure 1](#)). Current guidance takes a single organism approach, focusing on PA. It does not consider other opportunistic premise plumbing pathogens and the possibility of multiple pathogen outbreaks reflecting a biofilm source.

Whilst some in depth expertise in areas such as water safety, decontamination and ventilation has been developed amongst infection control specialists, this is by no means widespread and there is a need for more individuals to be trained with succession planning being a priority.

Delivering infection control training is inherently more complex than medical microbiology, as practical experience for the latter is available daily but for infection control is often acquired from managing outbreaks. Some training programs are trying to address this by allowing trainees to manage incidents under supervision. An additional challenge is combined infection training, whereby trainees spend less time in microbiology laboratories and opportunities for training in IPC may be less in comparison to historical training programmes. Having been dual specialty trained, new Consultants are keen to have sessions for both microbiology and infectious diseases in job plans, with less potential for sessions devoted to specialist areas such as water safety.

One way to approach this problem is to develop sub-specialisation within infection control (as has happened in many

other medical and surgical disciplines). Sub-specialisation would allow individuals to build up expertise in the built environment e.g. water, wastewater, ventilation, interpretation of typing results in relation to the environment etc. The difficulty might arise that in smaller hospitals there is not enough work to gainfully employ an individual. This could be solved by providing a service at a regional level. Such specialists might attend water safety committees on several sites, imparting their knowledge to local teams. Learning networks offer the potential for sub specialists to further develop their expertise.

Sub specialisation is important to users of the service. Without this there can be no guarantee that the infection control presence requested at meetings has the relevant knowledge/skills, but more importantly if this is not the case it will not be recognised. Knowing an infection control specialist in the built environment/decontamination/ventilation/surveillance is available and required should prevent such situations arising and may prevent outcomes such as those pictured ([Figure 1](#)).

Conflict of interest statement

The authors have none to declare.

Funding

None received.

References

- [1] Queen Elizabeth University Hospital review. June 2020. [finalreportpublishedversion458529_sct0220167968002_queenelizabethuniversityhospitalindependentreview_p3-1.pdf \(emap.com\)](#), [Accessed 28 September 2021].
- [2] Royal Hospital for Children and Young People and Department of Clinical Neurosciences: review of water, ventilation, drainage and plumbing systems. 11 Sept 2019. <https://www.gov.scot/publications/nhs-national-services-scotland-review-water-ventilation-drainage-plumbing-systems-nhs-lothian-royal-hospital-children-young-people-department-clinical-neurosciences/>. [Accessed 28 September 2021].
- [3] Inquiry into the construction of the QEUH, Glasgow and the RHCYP/DCN, Edinburgh: terms of reference. 15 June 2020. <https://www.gov.scot/publications/inquiry-into-the-construction-of-the-qeuh-glasgow-and-the-rhcyp-dcn-edinburgh-terms-of-reference/>. [Accessed 28 September 2021].
- [4] Stockley JM, Constantine CE, Orr KE. Building new hospitals: a UK infection control perspective. *J Hosp Infect* 2006;62: 285–99.
- [5] Department of Health. Water systems. Health Technical Memorandum 04-01: Addendum. 2013. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/140105/Health_Technical_Memorandum_04-01_Addendum.pdf. [Accessed 28 September 2021].
- [6] Kohn J. Pseudomonas infection in hospital. *BMJ* 1967;4:548.
- [7] Halstead FD, Quick J, Niebel M, Garvey M, Cumley N, Smith R, et al. Pseudomonas aeruginosa infection in augmented care: the molecular ecology and transmission dynamics in four large UK hospitals. *J Hosp Infect* 2021;111:162–8.