



Letter to the Editor

Role of the kitchen environment



Dear Sir or Madam,

We read with interest the article by Prescott et al. initiating a debate on the involvement of the ward kitchen environment in transmission events to patients. [1].

Ward kitchen sinks were implicated in an E. coli outbreak in Manchester. [2] A hospital wide CPE outbreak linked to salads becoming contaminated within the main kitchen has also been described by Professor Exner. [3] In this instance, contamination of kitchen drains was thought to have arisen following the use of a coil to unblock the kitchen sink which had previously been down the main sewage stack in the hospital.

Whilst much thought goes into the design of clinical hand wash stations, the same processes are not applied to other types of sink within a healthcare environment. Water directly hitting a drain sieve is at high risk of dispersing drain organisms, but this is not uncommon in kitchen sink design. [4] Disposal of carbon sources down the drain promote bacterial growth and biofilm formation which can subsequently grow up a drain at the rate of 1 mm/h. Whilst it may be possible to minimise such practices with clinical hand wash stations, kitchen sinks are necessarily used to dispose of food/drink waste which will support bacterial multiplication.

Washing/rinsing of any equipment in a sink (kitchen or otherwise) incurs a risk of acquiring and transmitting drain organisms if the item does not go through a recognised subsequent decontamination process. Ward dishwashers are an important method for decontaminating utensils but often lack the appropriate regulatory oversight. In one outbreak (M Weinbren, personal communication) of a highly resistant strains of *Pseudomonas aeruginosa*, a causative factor was the ward dishwasher being out of use; necessitating washing of patient water jugs in a kitchen sink (from which the outbreak strain was isolated). The dishwasher had been out of action for over a month. We suggest infection control teams should make enquiries into the timeframe specified in service level agreements for repairing of dishwashers. As it is unlikely service providers will be able to repair all dishwashers on the same day, we suggest the safest policy is to have spare functioning dishwashers on site which can be swapped with ones that have failed in order to ensure wards have continuity of use.

Whether dishwashers are located in wards or centralised locations, they should be subject to regular cleaning and maintenance as per manufacturer's instructions, with

responsibilities for such clearly defined. A risk assessment should be undertaken before installing a dishwasher in a ward kitchen and they should be avoided in wards housing immunosuppressed patients e.g. haemato-oncology units, cystic fibrosis wards. Dishwashers were removed from high risk wards in one Scottish hospital following a waterborne outbreak and the identification of pathogenic moulds including *Exophiala dermatitidis* from them. [5] Eight patients in one cancer centre developed fungaemia secondary to the pathogenic yeast *Saprochaete clavate* from a contaminated dishwasher. [6] Where installed, dishwashers should be allowed to cool before opening as release of pressure and steam may enhance dissemination of fungal spores. Plumbed in water coolers may also be present in ward kitchens and should also be subject to risk assessment and regular cleaning/maintenance. [7].

We would also like to highlight the issue of how water is collected for patients. Common practice is to place a bowl or a jug in the sink whilst filling the receptacle which is likely to result in contamination of the base with drain organisms which may subsequently be transmitted to patients (or other surfaces and then onto patients). Whilst point of use filters provide a simple solution to provision of safe water they often incur the same issues because the receptacle comes into contact with the drain below the filter.

Drainage systems provide a superhighway for the transmission of organisms around the healthcare setting. [8] Highly antibiotic resistant organisms are providing information about deficiencies in current design and practices of water/drainage systems. The resistant strains are not thought to possess any special attributes for dispersal from the sources but merely attract our attention unlike sensitive strains. There is a pressing need to learn and improve on design to stem spread of antibiotic resistance but also in light of the new national programme to build new healthcare facilities in England.

Conflict of interest statement

The authors have no conflicts of interest to declare.

Funding

No sources of funding were received for this article.

References

- [1] Prescott K, Billam H, Yates C, Clarke M, et al. Outbreak of New Delhi Metallo-Beta-lactamase Carbapenemase Producing Enterobacterales on a bone marrow transplant unit: Role of the

- environment. *Infection Prevention in Practice* Volume June 2021;3(Issue 2):100125.
- [2] Decraene V, Phan H, George R, Wyllie D, et al. A Large, Refractory Nosocomial Outbreak of *Klebsiella pneumoniae* Carbapenemase-Producing *Escherichia coli* Demonstrates Carbapenemase Gene Outbreaks Involving Sink Sites Require Novel Approaches to Infection Control. *Antimicrobial Agents and Chemotherapy* 2018;62(Issue 12). e01689-18.
- [3] Weinbren MJ. Dissemination of antibiotic resistance and other healthcare waterborne pathogens. The price of poor design, construction, usage and maintenance of modern water/sanitation services. *Journal of Hospital Infection* 2020;105(Issue 3):406–11.
- [4] Aranega-Bou P, George R, Verlander N, Paton S, Bennet A, Moore G. Carbapenem-resistant Enterobacteriaceae dispersal from sinks is linked to drain position and drainage rates in a laboratory model system. *J Hosp Infect* 2019. <https://doi.org/10.1016/j.jhin.2018.12.007>.
- [5] Inkster T, Peters C, Wafer T, Holloway D, Makin T. Investigation and control of an outbreak due to a contaminated hospital water system, identified following a rare case of *Cupriavidus pauculus* bacteraemia. *J Hosp Infect* 2021;111:53–64.
- [6] Menu E, Criscuolo A, Desnos-Ollivier M, Cassagne C, D’Incan E, Furst S, et al. *Saprochaete clavata* Outbreak Infecting Cancer Center through Dishwasher. *Emerg Infect Dis* 2020;26:2031–8.
- [7] Jung J, Choi HS, Lee JY, Ryu SH, Kim SK, Hong MJ, et al. Outbreak of carbapenemase-producing Enterobacteriaceae associated with a contaminated water dispenser and sink drains in the cardiology units of a Korean hospital. *J Hosp Infect* 2020;104:476–83.
- [8] Breathnach A, Cubbon M, Karunaharan R, Pope C, Planche T. Multidrug-resistant *Pseudomonas aeruginosa* outbreaks in two hospitals: association with contaminated hospital waste-water systems. *J Hosp Infect* 2012;82:19–24.

M. Weinbren^{a,*}, T. Inkster^b

^aDepartment of Microbiology, King’s Mill Hospital, Sutton-in-Ashfield, UK

^bDepartment of Microbiology, Queen Elizabeth University Hospital, Glasgow, UK

* Corresponding author. Address:

E-mail address: mweinbren@outlook.com (M. Weinbren)

Available online 16 June 2021