

Looking deeper

The Journal of the Water Safety Forum

Issue 5 | August 2019

Inside this issue

Risk assessing basins and taps
pg 6-8

Water hygiene training for
'responsible persons'
pg 8-9

Hospital hand wash basin usage
pg 10-12

The power of red: inclusive design
pg 14



Bringing the ‘basics’ back into focus

Looking Deeper Editor, **Susan Pearson**

This issue of Looking Deeper sees the launch of our new ‘Back to Basics’ supplements, a series of quick reference guides on some of the issues in infection control that we all – clinical, ward and facilities staff alike – sometimes need to be reminded about.

“There is significant scope for improving awareness of the key waterborne pathogens.”

The inspiration for these supplements came out of numerous conversations, often at conferences and seminars, which suggested there is significant scope for improving awareness of the key waterborne pathogens – *Pseudomonas*, *Legionella* and mycobacteria – amongst some healthcare and facilities personnel in order to better understand how good hygiene practices maintain water safety for patients. All these discussions, across a wide range of organisations, emphasised just how crucial a thorough understanding of

the mechanism by which these microorganisms are transmitted to patients, how water outlets can become contaminated and cross-contaminated and the potential consequences of “getting it wrong” is for everyone involved in looking after patients, particularly those in augmented care units.

This first guide puts the spotlight on *Pseudomonas aeruginosa*, now listed by the World Health Organisation (WHO) as one of 12 antibiotic-resistant “priority pathogens”. In the UK, *P.aeruginosa* is the cause of around 10% of all hospital-acquired infections (HAIs).

Following supplements will cover *Legionella*, the bacteria that causes Legionnaires’ disease, and topics such as aseptic technique and hand washing. As each supplement is intended as a ‘stand alone’ guide, there will be some crossover in the information covered.

However, while the supplements bring the ‘basics’ back into focus, the main Looking Deeper journal

will continue to delve more deeply into the latest thinking on water hygiene and safety. In this summer issue, our interview with authorising engineer Harry Evans discusses the latest requirements for ‘water hygiene training’, while independent consultant Elise Maynard explains how appropriate risk-assessment is as important as tap design in preventing bacterial contamination of these outlets.

A copy of the latest supplement will be included in subsequent issues of Looking Deeper, but extra copies (both print and PDFs) are available separately. For further copies, email us with your contact details at: editorial@lookingdeeper.co.uk

Another opportunity to explore water safety issues and hear discussions on specific case studies, relevant research and practical solutions from leading experts will be the next Armitage Shanks/Pall Medical water hygiene Masterclass in Glasgow in October. See page 16 for further details.

Contents

02

Editorial

05

Diary

10/12

Wash hand basin usage study

15

Latest research

03

Editorial Contributions

06/08

Risk assessing hospital basins and taps

12/13

Public toilet closures - new data

16

Identifying sepsis

04/05

In the News...

08/09

Why ‘water hygiene training’?

14

The power of red

Editorial Contributions



Harry is an Authorising Engineer (AE) with 30 years' experience including the design and maintenance of commercial, industrial and healthcare premises. He has worked as a Mechanical AE for the facilities management company Engie since 2016, providing a water quality maintenance service to the NHS. He previously worked within the NHS, at the Salford Royal NHS Foundation Trust from 2000, where he was Head of Operational Estates for over 12 years.

Harry Evans



Elise is an independent consultant to the water and medical device industries and a former Chair of the Water Management Society (WMSoc). She is a state-registered microbiologist and a Fellow of WMSoc, IHEEM, RSPH and IBMS. She chairs and presents at numerous international conferences.

Elise Maynard



Susan is an independent journalist and communications specialist with a background in biology, medical research and publishing. She has been writing on medical issues for over 30 years and on waterborne infection and water management since 2010. She has been a frequent contributor to IHEEM's Health Estate Journal, WMSoc's Waterline and the Clinical Services Journal.

Susan Pearson

Share your thoughts with us in the next issue

To keep the conversation on water safety flowing we would really value your reactions to this latest issue of Looking Deeper — we would appreciate hearing from you about what you liked, what you feel could be improved on, what topics you want to see discussed. We intend to publish some letters (with your permission) and would also welcome suggestions for contributions from our readers. You can contact us at editorial@lookingdeeper.co.uk



*Armitage
Shanks*

For commercial applications, Armitage Shanks, is the definitive British brand with pioneering solutions in washroom fixtures, fittings and water conservation. These solutions extend to bacteria sensitive healthcare environments, where the safe management and delivery of water is critical to controlling the spread of infection control and infectious diseases. Now leading the industry in safe water management, Armitage Shanks is committed to supporting the Water Safety Forum.

In the news...

Revised British Standard on *Legionella* risk assessment

A significant revision to the 2010 British Standard guidelines for combating the risk of Legionnaires' disease from contaminated water has recently been released by the business standards company BSI.

British Standard BS 8580-1:2019 *Water quality, risk assessments for Legionella control – Code of practice* now provides further recommendations and guidance on the assessment of the risk of Legionellosis originating from artificial water systems. Legionellosis is a collective term for diseases, including Legionnaires' disease, caused by *Legionella* bacteria, opportunist pathogens that inhabit aquatic and warm moist environments.

The revised standard aims to enable anyone with responsibility for the health and safety of others in any public premises, to undertake the



necessary risk assessments and adopt adequate prevention measures, as required under the Management of Health and Safety at Work Regulations 1999, and the Control of Substances Hazardous to Health Regulations 2002.

The revision of the 2010 British Standard was prompted by changes to the HSE's ACoP L8, which was finalised in 2014. Factors that prompted this revision included the shift from a single description of the risk assessment process and outputs to the recommendations for the frequency of inspection in each industry group.

National and global focus on hand hygiene

Hand hygiene has recently been under the spotlight - both nationally and internationally - with launches of NHS England and NHS Improvement's new national hand hygiene policy and the World Health Organisation's (WHO) global hand hygiene campaign.

The new NHS hand hygiene strategy aims to support a "common understanding" among healthcare personnel. Its development has been led by Dr Lisa Ritchie, infection control nurse consultant at Health Protection Scotland, who presented the policy at the Chief Nursing Officer for England's recent Summit.

Dr Ritchie said: "The primary aim is to support a common understanding making the right thing easy to do for every patient, every time. [The new policy] aims to reduce variation of practice and standardise care processes.... [to provide]...consistent messaging on IPC, including effective hand hygiene."

The policy sets "the how, the when and the what" around decontaminating hands in healthcare settings, a "once for England" approach that should save time wasted on duplicating hand hygiene policy.

The WHO 'Clean Care for All' campaign is inspired by the global movement to achieve universal health coverage. Its call to action includes: a global survey on infection prevention and control and hand hygiene; an implementation manual to prevent and control the spread of carbapenem-resistant organisms; and a series of downloadable posters.



Rebel over antibiotic resistance says Chief medic

Sit-ins, road blocks and individuals glued to the gates of Downing Street are just some of the non-violent actions carried out by the climate change campaigning group Extinction Rebellion — but the threat to humanity from antibiotic resistance is also so great that it too needs this style of campaigning to garner attention, according to England's chief medical officer, Dame Sally Davies.

Davies's comments followed the release at the end of April of a new UN report saying that failing to take urgent action on antibiotic resistance would result in 24 million people being forced into extreme poverty by 2030, leading to 10 million deaths a year by 2050 and making routine hospital procedures like knee-replacement surgery and childbirth far riskier than they are today.

Davies stressed: "It would be nice if activists recognised the importance of this... This is happening slowly and people adjust to where we are, but this is the equivalent [danger] to extreme weather."

"[Yet] there is not the appetite [among pharmaceutical companies] to develop new medicines," she also said. "There is a systemic failure. We need something similar to the IPCC."

The landmark report was published by the UN's Interagency Coordination Group on Antimicrobial Resistance (IACG).

IACG director Haileyesus Getahun called the threat of antimicrobial resistance "a silent tsunami" of which the public are largely unaware. However, it could yet be solved if people were educated about the dangers, he said.

Davies noted that a series of problems have been allowed to build up globally, from overuse of antibiotics to the unconstrained use of the drugs on animals, by far the widest antibiotic use worldwide.

Bad sanitation and lack of clean water that affects more than two billion of the world's population in developing countries is also fuelling the rise of antibiotic resistance.

The report calls for the use of antibiotics as growth promoters in farm animals to be abolished globally, and for the strongest antibiotics to be reserved for human use. The authors also called for pharmaceutical companies to "prioritise public good over profit", because drug development does not make companies money.



Dates for diaries...

Eurobiofilms 2019

3-6/09/2019 Glasgow, UK

biofilms.ac.uk/eurobiofilms-2019

5th International Conference on Prevention & Infection Control (ICPIC)

10-13/09/2019 Geneva, Switzerland

conference.icpic.com

NSF Legionella Conference 2019

11-13/09/2019 Los Angeles, USA

legionellaconference.org/

Infection Prevention 2019

22-24/09/2019 Liverpool ACC, UK

ips.uk.net/conference/about

Healthcare Estates Conference

9-10/10/2019 Manchester, UK

healthcare-estates.com/mm-agenda/

Armitage Shanks / Pall Medical Water Hygiene Masterclass

23/10/2019 Glasgow, UK

idealspec.co.uk/events.html

Designing Out 3

20/11/2019 London, UK

wmsoc.org.uk/conferences.php

What is the future of water in public health?

12/12/2019 Sheffield, UK

rsph.org.uk/events.html

Risk assessing hospital wash hand basins and taps

With the increase in knowledge and potential prevalence of multi-drug resistant (MDR) bacteria there is often an assumption that hand wash facilities, particularly the design and functionality of the tap, basin and waste designs are to blame for many of the waterborne infection outbreaks within hospitals.

By Elise Maynard

Since the media attention surrounding the *Pseudomonas aeruginosa* cases in neonates in 2012 and the ensuing intense research activities, there are now manufacturers supplying the healthcare sector who are focused on producing products that not only meet basic needs, but are also designed to reduce opportunities for bacteria to colonise and spread. Risk assessing such installations requires appropriate knowledge and often multi-disciplinary skills.

Taps

A tap (or terminal end fitting to give it its full title), is positioned at the end of the cold and/or hot water supply. There is now considerable research proving that taps can be infected via the water supply or by cross-contamination through the way they are used. This puts taps in a very vulnerable position and they can easily be affected by poor hygiene practices.

There is a train of thought that thermostatic mixing valves (TMVs) are more prone to biofilm formation than manual taps, as the water after mixing is the ideal temperature to promote bacterial growth.

In older building designs the TMVs are often hidden behind panels where they are somewhat “out of sight and out of mind” and sometimes difficult to access for accurate risk assessment. Newer tap designs however, may feature TMVs at the point of use. These should be referred to as thermostatic mixing taps (TMTs) and should not be confused with behind-the-panel TMVs, which are installed with a potentially vulnerable deadleg. Some designs also feature self-draining spouts, which have been developed in response to HBN 00-09¹ advice that swan-neck tap outlets are not recommended because they do not empty after use.

There is a debate surrounding the optimal temperature that water should be delivered to promote thorough hand washing — according to HTM 04-01² effective hand washing is best performed under running water at a safe, stable and comfortable temperature over basins/sinks. This is more accurately delivered by thermostatic fittings than by trying to manually mix water from hot and cold feeds. HBN 00-09 advises: “*non-TMV taps (commonly used in kitchens and on sinks in cleaners’ rooms/dirty utilities) allow the user free rein to determine the temperature of the water delivered at the point of use; however, a risk assessment should be undertaken first*”.

From a manufacturing perspective there is no general rule of thumb regarding the materials used between TMT and manual taps as it would depend on what type of valve and mechanism are being compared. A sequential operated TMT, which has been accepted as best practice in hospitals for over 20 years, would be most typical in a healthcare environment. TMTs deliver flow and temperature on a rotational control, and pull cold supply before hot, thus reducing stagnancy risk in both the cold and hot water supplies. They typically have a temperature control stop commissioned on installation to deliver the desired outlet temperature balanced against local variances of water temperature and pressure. Manual mixing valves could also be manufactured of very similar, or conversely, very different materials.

Healthcare specifiers should therefore be taking materials into consideration when making their choices – more brass and less polymers in all components would make common (microbiological) sense. HBN 00-09 notes that strainers, aerators and

flow restrictors should not be used as they become colonised with bacteria.

HTM 04-01 part C³ advises that: *“Taps, components and fittings should be removable and easily dismantled for cleaning and disinfection. When replacing taps, also consider fitting:*

- *taps that are easy to use*
- *taps to which a filter can be attached to the spout outlet”.*



When risk assessing, for example:

- A TMV positioned in a tap with a self-draining spout, where the residual water content is minimalised, cannot be compared with a TMV mounted behind a panel that has ≥ 1 metre

deadleg pipework from TMV to tap. However, all too often both fittings (albeit fundamentally different) are often referred to and risk assessed under the same generic term;

- TMVs should be maintained in accordance with HTM 04-01 supplement.⁴ There should be recorded evidence of inspections/audits. Note the in-service test procedure was significantly reduced in the 2017 HTM 04-01 supplement, which lightens the burden on Estates teams;
- The risk of scalding should be compared to the risk of a patient contracting a waterborne pathogen and an informed decision made in a proportionate manner i.e. considering if there is likely to be full-body immersion or whether the patient has an impairment;
- The presence of scale or damage to the tap and its general condition should be clearly noted, as well as whether aerators etc. are fitted;
- The presence of flexible-hoses should be noted and where they are being used e.g. augmented care, clinical areas or public wash-rooms. The priority for their removal should be rated against the comparative risk and it may be more practical and cost-effective to replace on life-cycle. However it should be noted that non-flexible hoses are EPDM lined. Responsible manufacturers prefer hoses lined with PEX as it is more widely used and accepted and as such may not require replacement;
- Check that taps have been installed correctly, with levers positioned so that they can be used with the elbow, if applicable and that check-valves etc. are fitted correctly.

Wash hand basins

Wash hand basins (WHBs) also need to be risk-assessed carefully — many of the examples highlighted in risk assessments are actually non-clinical basins that have been incorrectly fitted in clinical areas. HBN 00-10 Part C: ‘Sanitary Assemblies’⁵ clearly defines the difference between a clinical and non-clinical basin. Adhering to these best practice guidelines is essential and may require replacing old basins with new. This strategy itself also needs to be risk-assessed, to take into account the local patient susceptibility, the locale, e.g. ward or washroom, and the lifecycle of the tap.

In broad terms the basin could be considered the funnel to the waste pipework — and splashing from the waste has to be minimised. Back-outlet WHBs have been specifically designed and specified for use in clinical areas. Newer back-outlet WHB’s are now available that are designed to minimise splash by utilising smarter geometry and surface finishes.

The flow of water evacuation from the basin and outlet connector to the trap and any evidence of blockage or potential blockage with materials that should not be present (wipes, food-stuffs) should also be noted during the risk assessment.

Positioning of WHBs is also key. It may not always be possible to position 50 cm or 60 cm wide basins in all room layouts, although, they have been demonstrated to splash less than smaller hand-rinse WHBs (which are often found in wash-rooms), particularly as mixer taps should not contain flow-straighteners to soften water flow. It is essential to note the proximity of WHBs to patient beds, other items of equipment or anything that will present a risk if splashed, such as sterile packs. Installation must be checked to ensure that tap washers are not bulging and in contact with the water flow and that there is no excess of sealing compounds.

Example of non-clinical WHB and TMV mixer tap demonstrating splash risk from waste. Is the hand wash space sufficient for the user to wash their hands effectively without splashing and/or contamination from the open waste outlet? This may not be suitable on a ward but the risk is likely to be lower in a public wash-room.



Example of a small basin with a single lever non-TMV mixer tap in a clinical installation, resulting in splash. The scald risk needs to be assessed depending on patient contact and susceptibility.



Water safety groups and education

Education outlining what the clinical WHB should be used for is crucial. Studies by Public Health England (PHE) have shown a wide variety of materials within drain-traps including chewing gum and fruit debris. Cleaners have reported used needles and *Chlamydia* dip-sticks via their water safety groups (WSGs). Cleaning the basins themselves can be a challenge and risk assessments or audits should review cleaning protocols, how the cleaning staff are educated and how that knowledge is assessed. Ideally taps and basins should be cleaned and the taps run daily – this minimises the risk of stagnation, however responsibilities and records need to be defined and demonstrated.



It is clear that the WHB is being used for a lot more than washing hands and perhaps that is the biggest challenge. Informative risk assessments, infection control audits and good communication will advise the WSG in order to communicate to the various stakeholders effectively.

References

1. HBN 00-09: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/170705/HBN_00-09_infection_control.pdf
2. HTM 04-01 Part A: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/524880/DH_HTM_0401_PART_A_acc.pdf
3. HTM 04-01 Part C: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/524884/DH_HTM_0401_PART_C_acc.pdf
4. HTM 04-01 D 08 Supplement: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/607739/Health_tech_memo_0401_supp_D08.pdf
5. HBN 00-10: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/148497/HBN_00-10_Part_C_Final.pdf

‘Water hygiene training’ enhances microbiology awareness



Susan Pearson talks to Authorising Engineer Harry Evans about the importance of specific ‘water hygiene training’ for estates and facilities ‘responsible persons’.

Harry Evans has over 30 years’ experience as an Authorising Engineer (AE). As an AE for the facilities management company Engie he provides water quality maintenance to the NHS, following his previous roles within the NHS, including as Head of Operational Estates at the Salford Royal NHS Foundation Trust.

Harry emphasises how ‘water hygiene training’ (WHT) offers estates engineers a broader understanding of the issues around bacterial contamination and cross-contamination.

Who are ‘responsible persons’ for water safety in healthcare facilities?

Water systems in healthcare environments are large and complex with numerous outlets, both clinical and non-clinical (taps and showers) serving users that include the most vulnerable patients. Safe delivery of water in this context is down to an organisation’s multidisciplinary water safety group (WSG), who deliver a water safety plan (WSP) based on a “risk-management approach to the microbiological safety of water [that] establishes good practices in local water usage, distribution and supply.”¹

The WSG will generally include representatives from the infection prevention and control team, senior nursing staff from relevant augmented care units and estates/facilities personnel, including the ‘responsible person’ (RP) for water. The RP is highly trained to identify, control and manage risks through their in-depth knowledge of water ‘installations’ and should be the member of the WSG most ‘competent’ to make informed risk-based decisions.

My role as an AE at Engie is to carry out annual compliance audits on water safety for the

PFI Trusts I cover, which include competency assessments of the water RPs and deputy RPs (DRPs).

All RPs and DRPs, according to the Department of Health HTM 04-01 guidance (Part B on operational management),¹ must hold an accredited qualification from a recognised training provider. On top of this, they should be assessed to check they fully understand the specifics of the particular water system at their site — for example, how the water flows through their buildings — as well as being regularly monitored to verify that they continue to retain knowledge from their original training. For example, RPs must always be fully conversant with the control measures most fundamental to the health service — such as the use of temperature control for preventing growth of *Legionella*.

As most RPs are engineers by default, it is also important to review their knowledge of microbiological specifics, such as detection and alert levels for the most significant disease-causing waterborne bacteria.

However, this auditing of RPs' capacities has acquired a further dimension; since 2016, an update of the HTM best practice guidance now demands further specific 'water hygiene training' (WHT).

Why do RPs need 'water hygiene training'?

Facilities management has traditionally regarded WHT only in relation to training on the control of *Legionella* bacteria in the prevention of Legionnaires' disease. However, the WHT referred to in the HTM guidance focuses expressly on the prevention of contamination and cross contamination of water distribution systems, water outlets, components and associated equipment in healthcare environments — plus the crucial impact of "getting it wrong".



Salmonella typhi bacteria cause typhoid fever

WHT training in this context is a new departure for the Department of Health, yet water companies have been running such WHT courses for decades. These hark back to 1937, to a tragic epidemic of typhoid fever in Croydon, South London, which resulted in nearly 300 cases and the deaths of 43 people. The outbreak was traced back to a drinking water

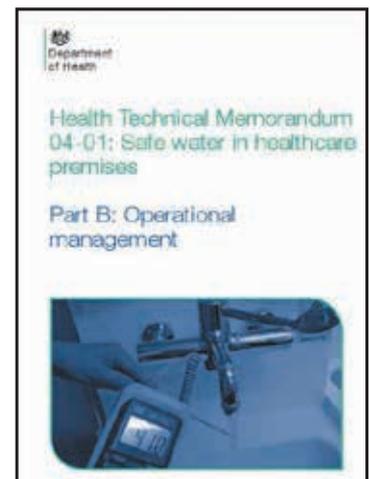
well that had been undergoing repairs. The subsequent investigation considered the infection likely to have been caused by one of the workers who was found to be a typhoid carrier.

As a consequence, individual water companies each introduced their own WHT course.

In 2006, these separate programmes were rationalised to become one national training, which was updated again in March this year. The EUSR (Energy and Utility Skills Register) National Water Hygiene Card is now mandated for anyone entering a clean water site or engaged in operations on the clean water network.

I came across this national WHT course some years ago and immediately realised its usefulness in the NHS context. I subsequently put all the engineers, electricians and even joiners at the Salford Royal NHS Foundation Trust, where I was in charge of Estates, through the water industry WHT. However, it also became clear that WHT needs to be more specifically tailored for healthcare environments.

Following the requirement in the 2016 HTM update, at Engie we decided to design and develop a course for our own PFI personnel. Taking the National Water Hygiene training as its model, this WHT includes a medical surveillance questionnaire to check if personnel might be carriers for any waterborne diseases. It then looks at issues such as poor design and good design, with the focus being: to create an understanding of contamination and how cross-contamination occurs; the significance of contaminated water and how and where 'biofilm', the slime in which pathogenic bacteria grow and multiply, occurs and proliferates; the importance of good hand hygiene; how to store equipment and fittings; and the role of the main three waterborne disease bacteria in addition to *Legionella*, namely, *Pseudomonas aeruginosa*, *Stenotrophomonas maltophilia* and non-tuberculosis mycobacteria.



Reference

1. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/524882/DH_HTM_0401_PART_B_acc.pdf

Hospital wash hand basins – a study on usage

An area of research in infection control currently throwing up numerous studies is looking at the impact of users' behaviour in relation to water outlets on the transmission of waterborne infections to vulnerable patients and nursing home residents.

This is a concern that was raised in several contexts in the last issue of Looking Deeper and is likely to keep recurring. For example, wash hand basin (WHB) and sink traps are increasingly recognised as reservoirs of infection — and ever more so from multi-antibiotic-resistant organisms. This is because of the traps' potential to build up debris that provides nutrients for bacterial growth — debris which can include food and other substances, even antibiotics and other pharmaceuticals, that have been inappropriately flushed down outlet drains.

At a leading teaching hospital, a recent investigation to analyse how clinical WHBs are being used across several augmented care units revealed that basins are at times used for activities other than hand washing. It also shows that the most frequently used outlets are likely to suffer damage to plugholes and sealants, where limescale can build up, with the potential to harbour microbial growth.

This data illustrates once again the importance of better education for healthcare staff on the correct way to use WHBs, as well as emphasising the need for more training on best practice cleaning.

Methods

The study carried out an audit of 54 WHBs across three wards, plus an in-depth observational analysis of WHBs on one ward. The three wards assessed were: 1) Haematology/Oncology day unit (23 basins), 2) Neonatal intensive care unit (NICU, 12 basins) and 3) Cardiac intensive care unit (CICU, 19 basins). The audit was carried out between 8 am and 11 am in order to cause the least disruption to staff and patients.

All basins were assessed for: limescale; mould; damage to the sealant between the basin and the panel, to the panel behind the sink and to the plughole; improper storage of items on sink; and signage to indicate *Pseudomonas*-positive results linked to that sink.

The in-depth analysis observed four NICU ward WHBs three times a day (morning, afternoon and evening) on three consecutive days, for a total of 54 hours.

All interactions with the WHB were observed for 90 minutes at a time and categorised as: hand washing; using of alcohol rub; and 'other', i.e. any activity that the WHB should not be used for.

Results

WHB audit results

Different WHB designs were found across the wards (see Figure 1) but none of the WHBs were found to be unhygienic or unsafe.

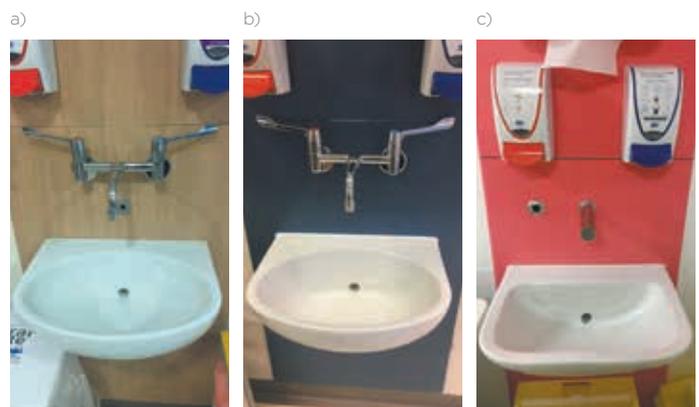


Figure 1. Design of WHBs found in audited wards: a) ward 1, b) ward 2 and c) ward 3.

The most frequently observed issue (32.8% of WHBs) was damage to the sealant between the basin and the panel, while limescale and dirt and damage to the sink panel were also frequent, at 18% for each. Damage to the plughole was seen in around 10% of the audited WHBs (Figures 2 and 3).



Figure 2. Example of damage to a basin plughole.

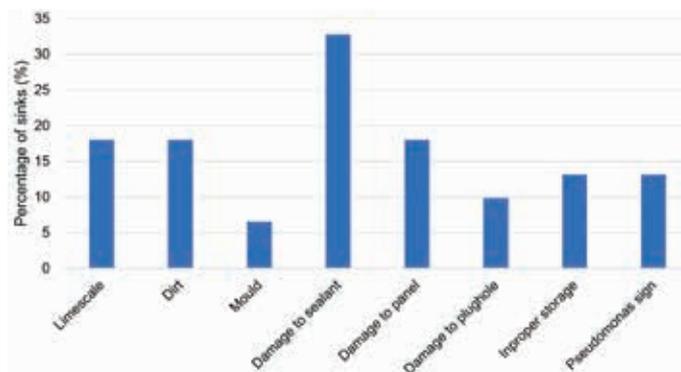


Figure 3. WHB audit findings showing the number of stations not in ideal condition.

Significantly, around 13 % of the basins were providing improper storage space for personal care products for the staff, plus bottles of formula and other feed, as well as pharmaceutical products (Figure 4).

More specific trends were seen in each of the wards audited:

- *Ward 1* had the worst figures for limescale and dirt and damage to sealant between the bowl and the panel, as well as damage to the plughole and improper storage;



Figure 4. Examples of use of sinks for improper storage.

- *Ward 2* also had a high proportion of basins with some visible dirt, as well as being used for improper storage;
- *Ward 3* had a high proportion of WHBs with damage to sealant between the bowl and the panel, the most WHBs with damage to the back panels (33.3 %) and was the only ward which contained WHBs with *Pseudomonas* signage (38.1 %). Other observations noted use of an unsuitable WHB design; an out-of-use WHB in a treatment room that had been converted to a staff office; and storage of contaminated toys in a bag on an equipment sink.

WHB use observation results

Damage to the sealant (four out of four) and damage to the panel (three out of four) were very common on these particular WHBs. Overall, the basins were used to wash hands three and four times in any 90-minute period and for alcohol rub once each period. However, they were also used for 'other' activities (Figure 5), which most often involved disposal of pharmaceutical products contained in medical devices, such as IV bags. Instances of clinical staff disposing of washing fluid after cleaning the patient have also been reported.

Table showing overall HWB use per 90-minute observation period.

	Overall		
	Hand washing	Alcohol rub	Other
Mean	3.54	1.04	0.48
Standard deviation	1.71	0.41	0.36
Maximum	6.08	1.50	1.00
Minimum	2.42	0.50	0.17

Figure 5. Mean number of instances of each activity during each 90-minute observation period.

Only clinical staff, predominantly nurses, were observed using the study WHBs. Patients and their visitors did not use the WHBs: the NICU patients are immobilised so are not able to use WHBs, while visitors used WHBs elsewhere.

A clear variation was revealed between the numbers of times each basin is used for different activities. One WHB was used significantly more than the others for all activities throughout the observation period, probably because the severity of the condition of the patient in that bed required more care and therefore higher levels of hand hygiene.

WHBs were also found to be used more for all activities on day two of the study, perhaps because the seriousness of the patients' condition on that day required more frequent interventions.

Different activities were also found to take place according to time of day. Hand washing appears to occur slightly more frequently in the morning, as does the use of alcohol rub. The use of WHBs for non-hand washing activities is more likely to occur in the evening, perhaps because the ward round takes place in the morning resulting in higher frequency of hand hygiene instances. The morning is also when daily interventions, such as washing, take place (Figure 6).

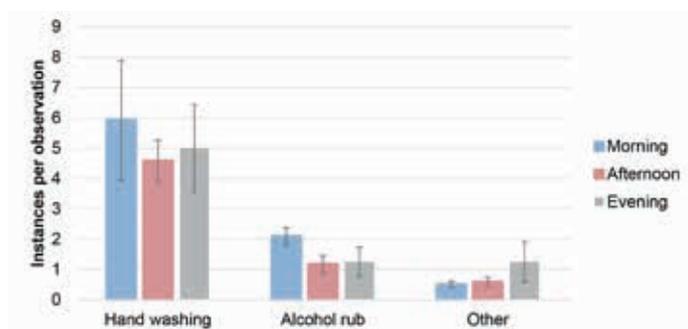


Figure 6. Mean number of instances of each activity during each of the three daily 60-minute observation periods.

Discussion and recommendations

The WHBs observed in this study had undergone a high level of wear and tear, most likely due to the high-dependency status of the patients on this ward. This demonstrates that patient population is likely to be a strong driver for hand hygiene and variation in the frequency of use should be taken into account when designing WHBs. A recommendation would be to improve WHB design to increase longevity.

It is also important to take into account the type of ward where a WHB will be stationed, the probable frequency of hand hygiene and the type of use it is likely to get when deciding which design to select.

Overall, while the WHBs were found to be generally in good condition and used predominantly for hand washing, the study concurred with other investigations that there is room for improvement in how these basins are used.

The full study can be found at: idealspec.co.uk

Public toilet closures

In the last issue of Looking Deeper, we reported on the public health impacts of the closure of public toilets highlighted by new research from the Royal Society for Public Health (RSPH). This data has now been released in a newly published RSPH policy paper, 'Taking the Piss', which calls for urgent action on what is argued is a population health issue that has been overlooked for too long: the state of our public toilets.

This is an issue that affects everyone in society and yet, the report argues, there is a stubbornly persistent 'toilet taboo' that stands in the way of a serious policy discussion that needs to be had. Dwindling public toilet numbers in recent years has a health impact we cannot afford to ignore and, what's more, this burden tends to fall disproportionately on already disadvantaged groups.

In recent decades an increasing pressure on local authority budgets has led to the privatisation or closure of many public toilets. Many now are sub-contracted or privately operated and make a charge. The wider picture is that between 2011 and 2016 as many as four in every five UK councils cut spending on public toilets, leading to what a 2016 BBC report described as 'deserts of inconvenience', identifying ten areas of the UK which had no council-run toilets whatsoever, now risen to 37.



Former public toilet building in Clevedon, North Somerset, reduced down to one toilet.

Yet more is at stake than simple *inconvenience*. For those with medical conditions such as diabetes, or related to the bladder, bowel or prostate, this need is far greater in both urgency and frequency. Likewise

s – new data on ‘Taking the Piss’

for parents who require nappy changing facilities, as well as for older people. For many, fear of or knowledge of a lack of facilities nearby can tie people to within a small distance of their home, acting as a ‘loo leash’. It is deeply concerning that at a time when public health policy is to encourage outdoor exercise, partly to reduce obesity and also to keep our increasingly elderly population fit and engaged with the community, our declining public toilet provision is in fact encouraging more people to stay indoors.

Restricting exercise and fluid intake

The RSPH research, based on a nationally representative 2,000 strong sample, found that one in five of the public (20%) are ‘not able to go out as often as [they] would like because of concerns around a lack of public toilets.’ For those with an illness or condition requiring more frequent toilet use, this figure rose to above two in five (43%).

The data also revealed that over half the public (56%) report restricting fluid intake either occasionally or frequently, specifically due to concern that they might not find a toilet. This can be a harmful practice for anybody, but for those with existing medical problems it can seriously exacerbate them. Altogether, these are alarming statistics with regard to health impact, and not insignificant obstacles to wider attempts to curb obesity, increase fitness and reduce health inequalities.

The report also looked into gender differences in the usage and perceptions of public toilets, for example with regards to why people sometimes choose not to use public toilets, and what people do when there is none available (see Figures 1 and 2).

Percentage using alternative toilets

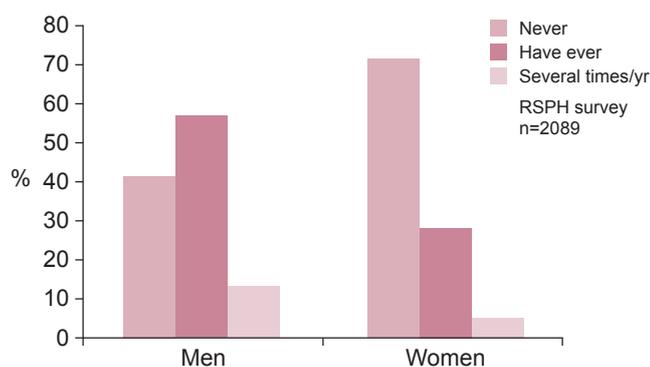


Figure 1. Percentage of men and women reporting use of a back alley or bush when no public toilet is available.

Reasons given for not using a public toilet

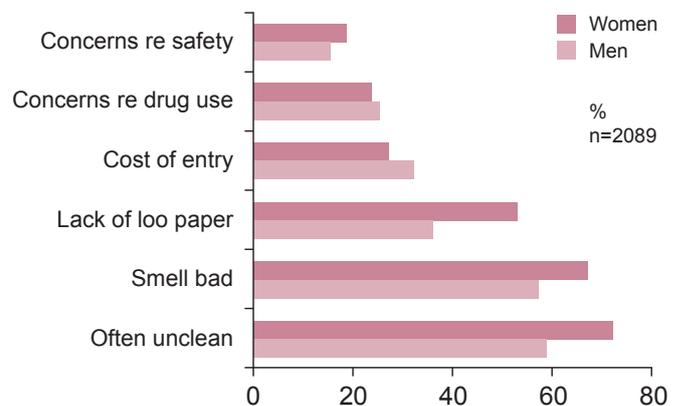


Figure 2. Reasons given for not using a public toilet, by gender.

Call for legislative action

The report’s most ambitious call is for legislative action on the part of Government, to make the provision of public toilets compulsory on a well planned and regulated basis. Although a resounding 85% of the public backed this call, the authors also recognised that public enquiries to date have failed to identify this as a funding priority at either local or national level. However, statutory provision would place a financial burden on local authorities that, given years of sustained cuts to funding from central government, would be very difficult to take on. The RSPH is therefore urging that it is crucial for the Government to use the forthcoming Spending Review to adequately resource local authorities. In the absence of other short term funding prospects for public toilet provision, the report suggests that radical and innovative methods for paying for them are piloted. One proposed scheme is a ‘Spend a Penny’ campaign — a one-pence charge drawn from the price of every train and bus ticket to finance free toilets in the local area.

The lack of public toilets disproportionately affects people with ill health or disability, the elderly, women, outdoor workers and the homeless. As the report argues, this is a threat to health, mobility, and equality, and it is high time these services are considered as essential as streetlights and waste collection.

You can read the full report and its recommendations at: <https://www.rsph.org.uk/uploads/assets/uploaded/55dc0c70-b719-4b35-a937cbc5144f2262.pdf>

The power of red: dementia-friendly design in healthcare



The number of people in the UK with vision problems is growing as the proportion of over-65s increases. When the sight loss often caused by dementia is taken into account, the design of healthcare settings needs to consider the ability of this group to access and navigate these buildings.

This is the thinking behind the introduction of Armitage Shanks's new range of red rails and seats as part of its accessible healthcare offering, as research shows red to be the most effective contrast colour for people with sight loss and dementia.

Kate Sheehan, Occupational Therapist and Director of The OT Service, said:

“All over the world we associate red with warning and danger, as we can see it more clearly than other colours. Recent evidence suggests that red can help people with dementia and sight loss recognise and navigate different rooms and environments.”

For those affected by poor vision and coordination, activities of daily life, such as using the bathroom, can become very difficult and sometimes dangerous. However, when a person suffers from dementia as well as sight loss, wayfinding and orientation issues are magnified. Difficulties a person with dementia and sight loss may experience may include less sensitivity to differences in contrast and being less able to identify different colours.

There are solutions available that support partially sighted people in using the bathroom, such as grab rails, back rests, slip mats and inclusive showers.

However, for those living with both dementia and sight loss, extra provisions, such as greater levels of colour contrast, need to be made due to the complications of these combined conditions.

A number of studies, such as the research by region of Peel Public Health,¹ indicates that effective use of colour and contrasts for walking loops in dementia care homes can have therapeutic effects for a person with dementia and assist with their wayfinding.

In the bathroom, contrast should be applied to differentiate areas of concern, such as toilet seats, grab rails, and edges. Useful contrast in these areas is gained by placing coloured products against a lighter background, such as the floor or walls.

The Office for National Statistics estimates that in 50 years' time there will be an additional 8.6 million over-65s in the country. On top of this, according to the Royal National Institute of Blind People (RNIB), the current 360,000 people in the UK currently registered as blind or partially sighted, plus two million with severe hindered vision, is set to rise to more than 2.7 million by 2030 and to nearly four million by 2050.

This combination of a growing elderly population, the associated increase in poor vision and the prevalence of dementia means that the design of hospitals and residential care properties must maximise levels of inclusivity and accessibility in bathrooms.

Reference

1. Region of Peel Public Health “Dementia Friendly Design Features for Walking Paths: A Focused Practice Question”, 2017.

For more information on the Armitage Shanks inclusive range of products, visit:
www.idealspec.co.uk.

Int J Hyg Environ Health.

2019 Mar;222(2):315-318. doi: 10.1016/j.ijheh.2018.11.001. Epub 2018 Nov 27.

Probable reinfection with *Legionella pneumophila* – a case report. Buchholz U *et al.*

In Germany community-acquired Legionnaires' disease is usually caused by the species *Legionella pneumophila*. Recurrent cases of Legionnaires' disease are rarely reported and are due either to a second infection (re-infection) or a relapse of a previous case. We report a case of recurrent Legionnaires' disease in an 86-year-old female patient infected with *L. pneumophila* serogroup 1, monoclonal antibody-subtype Knoxville, sequence type unknown. Between the two disease incidents the patient had completely recovered. *L. pneumophila* was detected with the monoclonal antibody-subtype Knoxville, sequence type 182, in the drinking water of the patient's apartment. Exposure to contaminated drinking water was interrupted after the first incident exposure through the application of point-of-use water filters. The filters were later removed due to low water pressure, and the second illness occurred thereafter. It is unclear if immunological predisposition has contributed to this case of probable re-infection of Legionnaires' disease. Clinical, microbiological and epidemiological information combined suggest this is a case of re-infection of Legionnaires' disease. In cases of recurrent Legionnaires' disease, complete collection of patient and water samples is necessary to differentiate relapse from re-infection cases.

Healthcare (Basel).

2019 Mar 8;7(1). pii: E39. doi: 10.3390/healthcare7010039.

A proactive environmental approach for preventing Legionellosis in infants: water sampling and antibiotic resistance monitoring, a 3-year survey program. Alexandropoulou I *et al.*

A proactive environmental monitoring programme was conducted to determine the risk and prevent nosocomial waterborne infections of *Legionella* spp. in infants. Sink taps in a neonatal intensive care unit (NICU) and two obstetric clinics were monitored for *Legionella* spp. A total of 59 water samples were collected during a three-year period. Twenty of them were found colonised with *Legionella pneumophila*. Standard culture, molecular and latex agglutination methods were used for the detection and identification of *Legionella* bacteria. Hospital personnel also proceeded with remedial actions (hyperchlorination and thermal shock) in the event of colonisation. The minimal inhibitory concentration values of erythromycin, ciprofloxacin was determined for *Legionella* isolates using the e-test method. The data indicate that the majority of neonatal sink-taps were colonised at least once during the study with *Legionella* spp. Among 20 isolates, five were considered as low-level resistant, three in erythromycin and two in ciprofloxacin, while no resistant strains were detected. Environmental surveillance in neonatal and obstetric units is suggested to prevent and reduce the risk of nosocomial waterborne infections in neonates.

Emerg Infect Dis.

2019 Mar;25(3):473-481. doi: 10.3201/eid2503.180336.

Mycobacterium avium in community and household water, suburban Philadelphia, Pennsylvania, USA, 2010-2012. Lande L *et al.*

We investigated MAC colonisation of household plumbing in suburban Philadelphia, Pennsylvania, USA. We used variable-number tandem-repeat genotyping and whole-genome sequencing with core genome single-nucleotide variant analysis to compare *M. avium* from household plumbing biofilms with *M. avium* isolates from patient respiratory specimens. *M. avium* was recovered from 30 (81.1%) of 37 households, including 19 (90.5%) of 21 *M. avium* patient households. For 11 (52.4%) of 21 patients with *M. avium* disease, isolates recovered from their respiratory and household samples were of the same genotype. Within the same community, 18 (85.7%) of 21 *M. avium* respiratory isolates genotypically matched household plumbing isolates. Six predominant genotypes were recovered across multiple households and respiratory specimens. *M. avium* colonising municipal water and household plumbing may be a substantial source of MAC pulmonary infection.

Promoting awareness to prevent sepsis deaths



Waterborne infections with *Pseudomonas aeruginosa* cause around 10% of all UK hospital-acquired infections each year. These are frequently severe and can lead to sepsis, the body's overreaction to an infection where, instead of

fighting an infection, the immune system attacks the body's own organs and tissues.

Sepsis can occur as a result of any infection, from a small cut or insect bite to a chest infection or urinary tract infection. It is more common than heart attacks and kills more people than bowel, breast and prostate cancer and road accidents combined – and its diagnosis and treatment could be costing the UK economy annually as much as £15.6 billion.

Sepsis affects at least 250,000 people in the UK every year. Around 52,000 of these people will lose

their lives to the condition, while 79,000 will suffer life-changing after-effects, be they physical, mental or emotional.

Despite these statistics, awareness is still far too low – yet with early diagnosis, sepsis is treated easily with antibiotics. It is estimated that better awareness could lead to as many as 14,000 fewer deaths in the UK every year.

2012 saw the foundation of the UK Sepsis Trust, which was set up with a clear mission: to save lives and improve outcomes for survivors of sepsis by instigating political change, educating healthcare professionals, raising public awareness and providing support for those affected. The Trust was set up by Dr Ron Daniels, after seeing too many needless deaths from sepsis in his role as a NHS consultant. Its goal is to end preventable deaths from sepsis and transform the way sepsis is handled in the UK.

For further information or support, visit: www.sepsistrust.org, call 0800 389 6255 or email info@sepsistrust.org

Healthcare Estates 2019

8th – 9th October, Manchester Central

At this year's event Armitage Shanks will be showcasing:

- How the design of fixtures and fittings can help reduce bacterial growth
- Integrated design solutions for clinical settings
- Looking Deeper issue 6 will be available on the stand

Stand Number D32

Armitage Shanks – Pall Medical Water Hygiene Masterclass

23rd Oct 19 Hampden Park, Glasgow

The masterclass offers the latest thinking on the management of water in healthcare from leading experts in the field.

A must for anyone involved in ensuring the safe delivery of water.

Book your free place here

https://www.idealspec.co.uk/events/water-hygiene-masterclass-oct-2019_26.html

Would you like to receive a regular copy of this Journal?

To receive a copy or online version of Looking Deeper, please email editorial@lookingdeeper.co.uk

