

Pseudomonas Addendum - report from RSPH conference 30 May 2013

The elegant name of the microorganism, *Pseudomonas aeruginosa*, deriving from the Greek for 'false unit' and the Latin for verdigris or copper rust, belies its ability to cause ailments from the unpleasant 'hot-tub rash' to fatal blood stream infections. The 'mon' [unit] part of the name was often used in the early days of microbiology, telling us that this gram-negative rod shaped bacterium has been known for a long time. The verdigris descriptive name for the species probably refers to the distinctive blue-green pigment seen in laboratory cultures, although other species occur. This miniature beauty was at first thought to be of little clinical importance, as it is ubiquitous in soil and water and lives harmlessly amongst other microflora on our skins. Although commonly isolated from wounds, burns and urinary tract infections, other more obvious invaders held the centre stage for attention until its ability to attack the very vulnerable, such as premature babies and seriously ill patients, was established in the 1970s. The development of specialised units for such patients gave the 'Pseudomonads' the opportunity to emerge as a cause of lethal infections, but control has been a problem and factors such as the low numbers in hospital outbreaks and "little off site contact" delayed definitive guidelines on the particular risk from these bacteria. Multi-resistant strains have emerged, with surveys indicating *P.aeruginosa* contamination of two thirds of random tap water samples in different types of intensive care units. In 2010, two Welsh hospital outbreaks were associated with colonization of water outlets by this versatile pathogen and in February 2013, wide publicity of a police investigation into four baby deaths at two Northern Ireland hospitals underlined the urgency needed for preventing infection. Case studies of these incidents and others were examined in detail for the conference.

Recent advice from the Chief Medical Officer and the report on evidence of tap and water system contamination in 2012, followed by the Addendum on water systems in March 2013ⁱ, made the RSPH conference timely, focusing on the risk assessments and water safety plans that are now advised, particularly in augmented care facilities such as neonatal units and intensive care. Speakers and delegates discussed the difference between mere compliance with advice and ensuring that systems are really safe. The latter means "regular and thorough" risk assessments that identify the range of potential contamination and cross infection in particular health care settings. Examples include: seeking changes and innovations in the design of hygiene and water facilities;

protocols for water/ tap sampling, testing and hand cleansing; screening for *aeruginosa* and regular updated training; as well as attention to changing tap filters, investigating poor engineering/ plumbing and the biofilms that may be present in pipework close to the outlet, the outlets themselves and fittings, particularly where flexible hoses are used and especially in augmented care units.

The adoption of water safety plans (WSP) includes the need for assessments to identify points within the system and any associated equipment where contamination could occur, as well as where appropriate controls can be effective. The WSP approach includes: the appointment of a multidisciplinary water safety group who have input into assessing the vulnerability of patients to waterborne infection; dealing with water quality issues; setting priorities and advising on remedial actions. This helps to ensure that resources are used to deal with problems on a priority basis. The WSP is systematic, for example, beginning by assessing the incoming water quality, including checks for cross connections if a borehole supply is present, along with the mains water from outside, through to ensuring training; communication and surveillance are all in place and kept under review.

These measures should help to control a range of opportunist waterborne microbes, such as *Stenotrophomonas maltophilia*, environmental *Mycobacterial* species and *Klebsiella*, with the water system guidance also applicable to that other bacterial scourge, *Legionella*, that emerged from the environment to stalk the corridors of hospitals. But the naming and shaming of the Pseudomonads is long overdue and this important meeting provided both clear advice and a chance for lively discussion with experts and practitioners in the field. Chaired by the convenors of the new special interest water group at RSPH and with speakers from clinical care, microbiology, public health, the Departments of Health, the Health and Safety Executive and facilities and water management, this was a well focused symposium and a topic that will benefit from future review as the 'Addendum' is applied in our care units.

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ⁱ Department of Health, England. HTM 04-01 - Addendum: *Pseudomonas aeruginosa* – advice for augmented care units. Best Practice Guidance for Water Systems, March

2013. Available online at:

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