Journal Watch

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The *Journal Watch* feature is provided as a service to our readers. The intention is to highlight new research and other developments in infection prevention and control and related fields, published elsewhere. A brief description of each article and its main findings are given here; readers are encouraged to refer to the full published article for the details of the work. The editorial management group would welcome feedback and recommendations for articles to feature in this column; for comments and recommendations please contact the editor: editor@ips.uk.net

The scope of infection and prevention and control practice is as wide as the scope of health and social care itself. The articles in this *Journal Watch* reflect this diversity. From what might be considered 'bread and butter' infection prevention, such as *Clostridium difficile* infection, through the technicalities of *Pseudomonas* in water systems, to less directly obvious topics such as organisational and professional culture or the merits of mandatory influenza vaccination of healthcare workers, infection prevention reaches a long way. Before all of these, an exploration of the value of infection prevention practitioners in nursing homes:

Wagner LM, Roup BJ, Castle NG (2014) Impact of infection preventionists on Centers for Medicare and Medicaid quality measures in Maryland nursing homes. *American Journal of Infection Control* 42: 2-6

The authors of this cross-sectional study have attempted to identify the effect on routinely collected quality indicators of the presence in nursing homes of dedicated infection prevention (IP) staff. Or at least that's the first impression that this paper gives; in fact, reading in more detail, a UK-based practitioner would probably see this as a study of link practitioners. The study involved a questionnaire assessment of IP resources in 127 nursing homes (NH) in Maryland, USA (54% response rate of 234 homes) combined with existing quality data. Full data were available for 123 homes. Using existing data sources means the outcome measures are a mixed set, including those not obviously directly related to IP, such as pressure ulcer incidence; others include resident influenza and pneumococcal vaccination, urinary catheter use and urinary tract infection (UTI) incidence. The results are mixed; there was a significant association between IP staff (by full time equivalent) and pressure ulcers and influenza vaccination but not the other outcomes as measured. A further result suggested that specialist training for the IP staff was not associated with improvement in any of the outcomes. An important point about cross-sectional studies is that it's not possible to infer the *direction* of any relationship from these data. So, it's possible that having IP staff improves quality outcomes – it's also possible that NH with good quality systems (and therefore good quality outcomes) are more likely to have IP staff in post. It's important to note that, according to the authors, all of the 'IP

staff' had other responsibilities, at least one and often three or four other roles; thus my view that this relates more to link practitioners than dedicated infection prevention practitioners as we understand them. In care homes that may well be the most likely scenario, so this study provides some support to the view that identifying link roles in these settings may have some quality benefits.

The first of two papers from *Journal of Hospital Infection* is a useful 'state of the art' summary of the difficult issue of *Pseudomonas aeruginosa* in the water systems.

Loveday HP, Wilson JA, Kerr K, et al. (2014) Association between healthcare water systems and *Pseudomonas aeruginosa* infections: a rapid systematic review. *Journal of Hospital Infection* 86(1): 7-15

The authors of this rapid systematic review bring an impressive array of expert, technical, clinical and methodological skills to this topic, which is causing significant ongoing difficulties for UK infection prevention and control teams. High profile outbreaks and incidents and the resulting changes to guidance in the UK have increased the need for an understanding of the relationship between hospital water systems and transmission of *P. aeruginosa*, particularly in high risk patient populations such as those receiving care in 'augmented care units'. The authors have reviewed the available evidence using a modified and rapid, but nonetheless rigorous, systematic approach and present results in three overall themes. A relatively small number of papers (25) were considered both relevant and of sufficient quality to include in the findings and only 11 of these provided what the authors describe as 'plausible' evidence. Briefly, the authors confirmed that *P. aeruginosa* is transmitted between water systems and patients and vice versa, although exactly how is unclear. Effective interventions identified were point of use filters and increasing chlorine disinfection; whereas some aspects of water system design, such as materials used, and the use of non-touch taps increased the risks of biofilm formation and transmission. Finally the authors were unable to find 'plausible' evidence to confirm that lapses in hand hygiene or contact precautions are potential contributory risk factors for transmission; though this seems a reasonable theory. For those investigating possible clusters of cases and their relationship to water systems, this paper makes some useful points about the limitations of standard microbiological methods to identify epidemiological links between patient and water system isolates. Most IP teams will read this for the content, and rightly so, but it's also worth reading as a guide to how to conduct a rapid systematic review of the literature in an area with limited high quality evidence available.

The second *JHI* paper of two in the same issue is about as different from the paper by Loveday and colleagues as it could be, but it's equally important to the work of IP teams.

De Bono S, Heling G, Borg MA. (2014) Organizational culture and its implications for infection prevention and control in healthcare institutions. *Journal of Hospital Infection* 86(1): 1–6

In recent years there has been a considerable shift in the roles of many working in IP, from technical expertise (though this is still necessary), to change agents. An understanding of organisational and professional culture(s) will be very helpful to IP teams in this aspect of their role; the authors of this article provide a useful summary. The article draws on the literature from infection prevention and control but also much more widely from healthcare and non-healthcare management, leadership and change management sources. After an introduction to the concepts of organisational culture and professional culture and their interplay, the article addresses the implications for infection prevention and control. Under headings such as 'leadership roles', 'innovation' and 'behaviour change' the authors describe the evidence for the influence of culture on health systems and outcomes; and where such evidence is lacking, for example in identifying the determinants of innovation in larger healthcare organisations. This summary of the theory and empirical evidence in this area is a very useful 'primer' for the infection prevention practitioner wishing to understand this topic and merits reading in full as well as exploration of the source materials. The paper continues with a description of reported strategies to achieve organisational culture change, focusing on the multi-modal and multi-dimensional aspects of the most ostensibly successful approaches to date. The authors conclude that considerable challenges remain in understanding organisational culture and subsequently identifying approaches to modify elements of organisational culture that impede effective infection prevention practice. It would seem that this is a challenge that IP teams need to take up if we are to achieve transformational change in our own settings.

In the January issue of *Journal Watch* I reported on a study of whole genome sequencing of *C. difficile* which cast some doubt on the relative importance of transmission (Wigglesworth, 2014), so by way of balance:

Landelle C, Verachten M, Legrand P, et al (2014) Contamination of healthcare workers' hands with *Clostridium difficile* spores after caring for patients with *C. difficile* infection. *Infection Control and Hospital Epidemiology* 35(1): 10–15

This article and the related commentary (Pop-Vicas and Baier, 2014) remind us, if we needed reminding, of some of the basics about infection prevention and control and *C. difficile* in particular. The results of this single centre study should serve as a useful aid in convincing clinical colleagues of the vital role of appropriate glove use and hand washing, when dealing with patients with known or suspected *C. difficile* infection. The authors sampled the hands of healthcare workers after an episode of clinical care (after removing gloves where worn but before hand hygiene). The study compared healthcare workers (HCW) caring for known cases of *C. difficile* (exposed) with controls whose contact was with patients not known to be *C. difficile* positive (unexposed). The authors also separated the episodes of contact into high and low risk contacts on the basis of the likelihood of contamination with faecal material. The results are interesting if not entirely surprising; *C. difficile* spores were recovered from the hands of 24% of

exposed HCW and none of those unexposed. In the exposed group the factors significantly associated with hand contamination with spores were high risk exposures and failure to wear gloves. Interestingly nearly half of those whose hands were contaminated failed to wear gloves for at least one care activity, and this is despite the fact they were aware they were being observed. The messages from this, albeit relatively small single centre study, are clear; hand contamination is a significant risk, gloves are necessary and do help when worn for the correct purposes, but they are not sufficient and hand washing is vital after their removal. Although the study was conducted in France, the associated commentary focuses on the USA, where they report that many states are still struggling to reverse the dramatic rise in *C. difficile* incidence they have been experiencing, contrasting this with the recent dramatic reductions seen in the UK.

Finally in this issue, not all IP practitioners will be involved in influenza vaccination campaigns, but whether you are or not, this head to head piece from the *BMJ* provides food for thought...

Behrman A and Offley W. (2013) Head to Head: Should influenza vaccination be mandatory for healthcare workers? *BMJ* 347:f6705 doi: 10.1136/bmj.f6705

This is a short piece and a thoroughly entertaining read. It summarises very neatly the arguments on both sides of the mandatory influenza vaccination debate. Whichever side of this argument you sit on it's worth reading both sides and reflecting on the points made. Amy Behrman for the 'yes' camp puts forward these arguments; influenza is a serious problem, nosocomial transmission is well recognised and those most likely to suffer the worst outcomes are those most likely to be admitted to hospital and benefit least from getting the vaccine (limited immune response). Perhaps her most persuasive outcome is that voluntary approaches generally have dismally poor results, with vaccination rates below 50% being the norm. She concludes that the risks of vaccination are so low and the potential benefits to patients so obvious that mandatory vaccination is an ethical priority for healthcare organisations – 'first do no harm'. Will Offley (who, relatively unusually for the *BMJ* is a nurse) puts the counter arguments. Quoting a Cochrane review he points out the lack of evidence of efficacy, he disputes the impact of seasonal influenza, questions the efficacy of the vaccine itself, quoting a low of 4.6% among a range of figures for the efficacy of the seasonal vaccine to prevent influenza and noting that protection may wane before the end of the influenza season. Offley's main point is one of ethics and the right to refuse medical treatment, which he argues staff, as well as patients, should have. So an ethical duty for the safety of patients or a personal decision based on the primacy of informed consent? The debate will go on!

If I had to point out one ethical duty that we all have as infection prevention practitioners, it would be the duty to keep our knowledge and skills up to date. I hope the *Journal Watch* section helps in a small way with that objective.

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- Pop-Vicas A, Baier R. (2014) Healthcare workers' hands and *Clostridium difficile* spores: making progress? *Infection Control and Hospital Epidemiology* 35(1): 16–17.

- Wigglesworth N. (2014) Journal Watch. *Journal of Infection Prevention* 15(1): 41–3