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 is given here; readers are encouraged to refer to the full published article for the details of the work. The authors and the editorial management group would welcome feedback and recommendations for articles to feature in this column; for comments and recommendations please contact neil.wigglesworth@gmail.com or editor@ips.uk.net.

Once again, this Journal Watch is a mixture of articles with no particular theme; when we can, we try to identify themes that either arise from the literature or correspond to an event such as the annual 5th May hand hygiene events. There is a tension between keeping the content topical and theming the issue; Journal Watch is never going to be a proper review of any subject. Having said that, if readers have any suggestions for themed editions, we would love to hear about them. The first study in this issue looks at simulation as an approach to education in infection prevention and patient safety:

Farnan JM, Gafney S, Poston JT, *et al.* (2015) Patient safety room of horrors: a novel method to assess medical students and entering residents' ability to identify hazards of hospitalisation. *BMJ Quality and Safety*; online first: 10.1136/bmjqs-2015-004621.

If you just glance at the title, this doesn't strike you as an article about infection prevention and control and it would still be valuable if it weren't. If you read on you'll quickly discover it has a very strong theme of infection prevention, placing it, arguably, where it belongs – at the centre of patient safety. This is a study from the field of medical education but I see no reason why its findings couldn't be useful in multidisciplinary training and education and be suitable for pre- and post-qualification situations. The idea of using simulated scenarios isn't new, but this is particularly well structured and the findings are of some interest. Essentially, the authors set up a simulated patient room (bearing in mind that this is a US study where many patients are in single rooms) and added nine patient safety hazards. Importantly this wasn't a simple 'spot the mistake' test, which many of us may have constructed at some point in our infection

prevention career. The test required the student (or intern) to interpret the patient's clinical information such as notes, drug orders and risk assessments as well as examine the clinical environment. Thus the test has some elements of 'situational awareness' included. Reflecting the importance of healthcare-associated infection (HCAI) in patient safety, three of the nine 'hazards' were HCAI-related. These are worth listing in full: patient with inappropriate/unnecessary urinary catheter; empty alcohol-based sanitiser and soap dispensers; and no PPE provided. For the latter two they add 'in patient with presumed/suspected *Clostridium difficile* infection (CDI)'; however, I think that's unnecessary and with regard to the alcohol rub, potentially misleading. The conditions of the test are described quite clearly; each participant had 10 minutes in the room with a clipboard to record every hazard they could identify and 5 minutes to input them to an online form. Their results are mixed, two groups took the test, students and interns, and there were significant variations in their ability to pick up the hazards. Interestingly the students were more likely (60% vs. 20%) than the interns to spot the unnecessary catheter, but less likely to spot the empty dispensers (60% vs. 80%) and much less likely to spot the missing PPE (13% vs. 60%). Obviously these data need to be treated with caution; we don't know how representative the students/interns were, but in a sense it doesn't matter, the value of the approach seems quite clear. The authors didn't give individual feedback or one-to-one debriefs which, if feasible, could increase the educational value of the exercise. Doing this as a patient safety, not just infection, exercise is a good idea practically, in terms of resource and philosophically; too often we artificially separate infection prevention out of patient care and management – this avoids that trap.

The second article in this issue reminds us of the power of vaccination and immunisation as a public health tool and

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also demonstrates the knock-on benefits for providers of acute healthcare:

Marlow R, Muir P, Vipond B, et al. (2015) Assessing the impacts of the first year of Rotavirus vaccination in the United Kingdom. *Eurosurveillance* 20(48): pii=30077. DOI: <http://dx.doi.org/10.2807/1560-7917.ES.2015.20.48.30077>.

Personally, I had forgotten that, here in the UK we have introduced Rotavirus vaccination, which may be a result of the success of the programme. The authors of this study from Bristol Children's hospital remind us that the vaccine was introduced in July 2013 and is given to infants aged up to 24 weeks maximum, in two doses. Data from Public Health England suggest uptake and coverage are good with about 90% of babies completing the two-dose course. These researchers decided to evaluate the impact of the vaccine on A&E attendances and admissions to a children's hospital for gastroenteritis, the year after implementation. They used enhanced surveillance of all children presenting with defined gastroenteritis and looked at a number of outcomes; number of attendances, number of admissions for all-cause gastroenteritis, cases of laboratory-confirmed Rotavirus (using PCR) and they calculated any resultant financial effects. The results are quite remarkable, despite any limitations, which I'll come to. In the first 'Rotavirus season' following the introduction of the programme, there was a 48% reduction in Rotavirus cases and a 53% reduction in admissions for all-cause gastroenteritis (both statistically significant). Similarly, there was a reduction in occupied bed-days in the hospital equal to 1.7 to 2 beds per day for the duration of the season. The proportion of samples positive for Rotavirus fell and, as well as a (calculated) 94% drop in Rotavirus-related attendances in children aged under 12 months, there was a circa 70% drop in older children (age range, 1–4 years) who were too old to have the vaccine. This suggests the possibility of a significant herd immunity protection effect. The authors calculated a fall in the number of admissions likely to be due to Rotavirus from around 180/year to 55 (a 69% reduction, $P < 0.001$). Finally, the financial benefits equated to a national acute care saving of around £7.5 million in the first year, based on A&E attendances and admissions to hospital. There are of course limitations, which the authors fully acknowledge, primarily that there is some evidence that 2014, the first year following introduction of the vaccine, may have been a 'quiet' Rotavirus season. Even if that's true, the results are probably still very impressive and demonstrate once again the power of vaccination and immunisation. We can keep hoping for the day when scientists vaccinate us all out of a job...

When it comes to multi-resistant Gram-negative bacteria we need all the tools in our toolbox. This next study examines whether chlorhexidine bathing should be part of the approach:

Chung YK, Kim JS, Lee SS, et al. (2015) Effect of daily chlorhexidine bathing on acquisition of carbapenem-resistant *Acinetobacter baumannii* (CRAB) in the medical intensive care unit with CRAB endemicity. *American Journal of Infection Control* 43(11): 1171–1177.

This study seeks to answer the pressing question of whether chlorhexidine bathing is effective against Gram-negative bacteria and focuses on whether it has an impact on acquisition of carbapenem-resistant *Acinetobacter baumannii* (CRAB). Although a series of studies have shown that chlorhexidine washes do work in the reduction of Gram positives, the evidence is inconclusive on whether it is also effective against Gram negatives. The study was a single-centre, time-series study carried out in a medical ICU in Korea over 2 years. In the unit, CRAB was endemic and in spite of introducing active surveillance cultures, pre-emptive contact isolation and enhanced cleaning all aiming to control endemicity of CRAB, there was no significant reduction in the rates of acquisition and environmental contamination in the ICU over a 14-month period. The researchers thus looked into 'advanced source control' and studied the impact of daily chlorhexidine bathing using commercially available 2% chlorhexidine body wipes over a 12-month period. The time-series study showed quite an impressive 51% statistically significant reduction in CRAB acquisition. As would be expected, the rates of CRAB contamination in the environment (especially patient-staff gowns and bed rails) were also reduced significantly during the chlorhexidine bathing period. Similar to other studies, chlorhexidine was part of a bundle of interventions to reduce CRAB acquisition; however, since it was introduced at a later stage than the rest of the interventions, its impact can be singled out. Still, one can only conclude that 2% chlorhexidine washing (using wipes) is effective when used in conjunction with active surveillance cultures, enhanced cleaning, pre-emptive isolation together with contact precautions and hand hygiene in reducing acquisition of CRAB. There have been reports of reduced susceptibility of multidrug resistant organisms in units using chlorhexidine washes. Although this study also sought to test for chlorhexidine resistance during the 12 months of chlorhexidine use, the methodology was poor and so the results are not strong, suggesting that further research in this area is required. This study is worth a read and further contributes to the body of evidence on effectiveness of chlorhexidine washes on Gram-negative acquisition and environmental contamination. Further research in this field is required, possibly with a large multicentre trial. Given that several studies have been published on this, a meta-analysis using the available evidence could be helpful, although this may be difficult, possibly due to lack of homogeneity of the studies.

There is a saying (often attributed to the Institute for Healthcare Improvement): 'every system is perfectly designed to get the results it gets'. This next paper suggests

the English NHS may be perfectly designed to over-prescribe antibiotics:

Ashworth M, White P, Jongsma H, et al. (2015) Antibiotic prescribing and patient satisfaction in primary care in England: cross-sectional analysis of national patient survey data and prescribing data. *British Journal of General Practice*; online first: pii: [bjgpjan-2016-66-642-ashworth-fl-p](https://doi.org/10.3399/bjgpjan-2016-66-642-ashworth-fl-p).

I found this study intriguing, mostly as it reports on the perceptions of patients as consumers and the potential impact this could have on GP antibiotic prescribing decisions. The aim of this study was to determine whether patients registered at GP practices that prescribed fewer antibiotics reported lower levels of overall patient satisfaction. The researchers utilised data on patients' satisfaction collected through the General Practice Patient Survey (GPPS) in 2012. This questionnaire is randomly sent out to 2.7 million adult patients across England. Although a response rate of only 36% was achieved, this accounted for almost 1 million responses. Regression models were used to correlate answers from some of the GPPS satisfaction questions with antibiotic prescription data and GP practice data. The study also compared satisfaction data with other prescription data such as other drugs and also cost of drugs prescribed. The study demonstrated that patients registered at practices that prescribe fewer antibiotics report lower levels of overall satisfaction with the care received from the GP. Although this is not the first study to report dissatisfaction following failure to prescribe antibiotics, as expected, the researchers interpret the results with caution and suggest that more research is required. Studies have demonstrated that GPs could tap into interventions such as better consultation skills and patient information booklets to offset any feelings of dissatisfaction by their patients. After this study was published its results made several headlines in the traditional and social media. It is evident that more needs to be done to educate the general public on the risks and threat of antibiotic misuse; this is one key role of infection preventionists. This is the first national study to look at prescribing variables as determinants of the patient experience in GP practices. The results from this study are worrying, as patient satisfaction reviews of GP practices are linked to the amount of reimbursement which the practice receives. In England, GPs receive higher reimbursement if their patients report positive experience of care. It is hoped that results from this study trigger more forward facing messages for patients on the issue of appropriate antibiotic use. It is also hoped that this study incites decision-makers to look at the current system of reimbursement of GPs, with the knowledge that the current system could be counterproductive and possibly consider a system where GPs receive higher reimbursement if they prescribe fewer antibiotics.

The final study in this collection is only a short report and really quite a simple study, but I include it because, quite frankly, it's a bit scary...

Manojlovich M, Saint S, Meddings J, et al. (2015) Indwelling urinary catheter insertion practices in the emergency department: an observational study. *Infection Control and Hospital Epidemiology*; first view article: DOI: <http://dx.doi.org/10.1017/ice.2015.238>.

This is a brief report, only two pages, of what seems to be a well conducted observational study, over 5 months during 2014, of urinary catheter insertion in the Emergency Department (ED) of a trauma centre, that is part of an academic medical centre. Over the period described, the researchers observed 81 insertion attempts involving 65 patients. The observation involved two observers on each occasion completing a validated audit tool that included: information about the inserter; checklists of practice with freehand field notes; and patient characteristics. The researchers also identified bacteriuria (but not urinary tract infection). The study had three objectives: to identify major breaks in aseptic insertion technique; to identify barriers or facilitators to aseptic insertion; and to identify which patients developed bacteriuria following catheter insertion in the ED. The criteria for major break in asepsis were: contamination of sterile field; contamination of catheter; and breach of sterile barrier. The overwhelming majority of insertions were done by registered nurses and the results make for fairly uncomfortable reading. At least one 'major breach' occurred in 48/81 (59%) of insertions. There were, in fact, at least 78 separate breaches as many procedures had more than one breach. Breaches were spread fairly evenly across the categories and some examples are given in the article; I'll quote just one: 'sterile gloved hand used to swab genitalia (without tongs); same hand used to insert catheter'. Seven patients developed bacteriuria of whom five had had major breaches identified. When the authors looked at the barriers, some classic Human Factors/Ergonomics (HFE) issues were identified such as inconvenient or inconsistent locations for hand sanitiser and limited room to establish a sterile field (and presumably work in an ergonomically effective way). This is a single-centre study from a very different health system, but if its findings reflect ED/A&E practice in the UK, we need to look critically at urinary catheters inserted in that setting, as a matter of urgency.

Infection Prevention is as varied and wide-ranging as the health and care settings in which it needs to be practised. This rather eclectic collection of studies illustrates this point very clearly. Whether it's education or practice, hospital or primary care, infection prevention is a key intervention and an important area for research and practice development.

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