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.

There's no particular theme to Journal Watch in this issue, other than it draws from a range of disciplines, rather than simply from infection prevention and control and related fields (though these are represented too). To start with, a review article from *BMJ Quality and Safety*, with some notable names among the authors such as Pronovost and Dixon-Woods. The review gives the reader a 'how to' list for measuring your quality improvement project:

Portela MC, Pronovost PJ, Woodcock T et al. (2015) How to study improvement interventions: a brief overview of possible study types. *BMJ Quality & Safety* 24: 325–336.

The debate about how to measure the effectiveness of quality improvement (QI) interventions has been raging for a number of years, ever since such interventions became 'mainstream' in fact. The authors of this review have summarised the options comprehensively and provide the reader with a ready reference when considering the design and implementation of a QI project. Such QI approaches are popular in infection prevention and control and related specialties, because they allow the measurement of interventions in 'real-life' settings. The first thing to note (albeit with tongue firmly in cheek) is that only authors steeped in the social sciences could describe a 12-page article as a 'brief overview'! The authors note that, despite the number of years these approaches have been used, the literature contains a great deal of editorial, commentary and narrative and very little solid evaluation of outcomes. The paper differentiates between QI projects *per se* and what the authors describe using the umbrella term 'evaluative studies'. QI projects use such methods as process improvement techniques, i.e. Lean, Six Sigma and the Model for Improvement,

sometimes (always with the latter) incorporating cycles of tests of change, such as PDSA (Plan, Do, Study Act). The primary data analysis approach in QI projects is Statistical Process Control (SPC) and the authors give a summary of SPC and how it measures common-cause and special-cause variation. This section is a useful revision of the subject and I recommend reading it in full (note the article is open access). To close this section, the paper notes the value of adding qualitative study to understand the context and mechanism of change and further, notes that despite the existence of reporting guidance (Ogrinc et al., 2008), the data measurement and analysis in QI is still often 'strikingly poor'. One solution may be to 'wrap' a research study around the improvement project. The authors go on to describe the options for doing this: randomised controlled trials, cluster randomised controlled trials, stepped wedge designs and quasi-experimental approaches such as controlled or uncontrolled before and after designs, other time series and longitudinal studies. They finish the article with a mention for systematic reviews, programme evaluation, qualitative research and economic evaluations. Overall, a smorgasbord of study designs for the QI enthusiast. Stepped-wedge and programme evaluation are worth further mention, as they may be less familiar to readers. Stepped-wedge designs allow for the incremental introduction of an intervention/innovation across a range of settings, such that some areas receive it earlier and the change in outcome in relation to the timing of the intervention can be measured consistently. Programme evaluation will be familiar to those in public health settings and examines in detail both what works and how it works in context (for more detail see Box 2 in the article). This article is more detailed than the title suggests and makes a good starting point for someone wanting to understand the range of

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measurement that is possible when designing QI projects. There's no doubt that, on the whole, the reporting of QI projects has been quite disappointing to date; those considering a project would do well to consider this article as part of their planning.

The next article is one that has been chosen as a possible recommendation or suggestion as part of your continuing professional development (CPD), as it summarises the state of current knowledge about latent tuberculosis infections;

Getahun H, Matteelli A, Chaisson RE et al. (2015) Latent *Mycobacterium tuberculosis* infection. New England Journal of Medicine 372(22): 2127–2135.

While this is not primarily an article about infection prevention and control, it serves as an excellent primer for understanding the process of infection in tuberculosis (TB). The focus of the article is on latent infection and because of this, it will broaden the knowledge and understanding of practitioners who normally deal only with cases of active TB infection. The article begins with the pathogenesis of the latent form of TB and subsequent progression to active disease. The key point being that after exposure to *M. tuberculosis*, there is a complex, dynamic process of microbe-immune response interaction that can lead to a number of outcomes, from elimination of the microbe through latent (or persistent) disease, to active TB at some later point in time. The prevalence of latent TB infection is quite dramatic. Although based on modelling undertaken a decade ago, the numbers are startling, with an estimate of over two billion people affected (over one-third of the population of the world). Internationally, prevalence varies dramatically; annual infection rates (presumably for active infection, the article does not specify) are quoted as very low in the United States (<0.1%) to 4.2% in South Africa. Interestingly the rates in South Africa are reported as being affected by an epidemic among miners exposed to silica dust, as silicosis is associated with progression to disease. Other risk factors for the development of active disease will be more familiar; HIV infection and other immune-suppressive factors are well recognised, including end-stage renal disease. Younger children aged under 5 years and infants also develop active disease more rapidly. These and other risk groups such as the homeless, prisoners, drug users, persons from areas of high TB prevalence and health-care workers may need assessment of their exposure to TB and management of latent infection. Our ability to diagnose latent TB infection is relatively limited, the available tests are limited as they only measure host-response to TB infection rather than infection directly. The tuberculin skin tests in particular are poorly discriminative, especially in countries like the UK where BCG vaccine is used, albeit in recent years selectively. In addition the skin tests are poorly reactive in the immune-compromised and require two visits to complete. The alternative tests are interferon gamma

release assays (IGRAs) which are more specific but not perfect and are more expensive. The article goes on to review the treatment and clinical monitoring options for individuals diagnosed with latent TB infection with a focus on ensuring completion of treatment as with active disease. Finally the authors consider the research priorities in this area; noting that modelling suggests that 'if 8% of persons with latent [TB] could be permanently protected each year the global incidence in 2050 could be 14 times lower than in 2013'.

Back to *BMJ Quality & Safety* for the third article in this issue, once again not specifically an IPC article, but one that clearly has relevance to our practice:

Sinuff T, Muscedere J, Rozmovits L et al. (2015) A qualitative study of the variable effects of audit and feedback in the ICU. BMJ Quality & Safety 24: 393–399.

Audit and feedback is an integral part of an IPC programme; to improve we must measure. However as shown in this study, the way the audit process is carried out and how and when feedback is given back to clinicians may not be achieving the desired impact on actual practice. The aim of this qualitative study was to gain a better understanding of the individual and organisational barriers to implementing audit and feedback from the perspectives of ICU clinicians and leaders. ICUs are big players in infection prevention, and audits in these units largely involve practices related to IP such as central line related infections or prevention of ventilator associated pneumonias. The authors hint that given the complexities of the environment in ICU, audit and feedback methodologies may need to be different than other areas in the organisation. The authors carried out semi-structured in-depth interviews with 72 ICU team members including doctors, nurses, respiratory therapists, pharmacists and ICU administrators recruited from 10 ICUs in Ontario, Canada. Participants were recruited until saturation of information was achieved. The overall perception was that audit and feedback was potentially useful but often failed to affect clinical care because of the way that it was implemented. For most participants, auditing was felt to lack transparency and credibility. The audit process was largely associated with negative perceptions such as feeling like Big Brother's watching or feeling marginalised due to lack of information sharing by auditors. Feedback was often circulated by email, posted notices or through staff meetings, none of which were felt to be particularly effective. Clinicians felt that feedback was untimely (thus irrelevant), incomplete and often not actionable. Many said they found it difficult to engage with the feedback provided because it was too abstract, passive and disconnected from care at the bedside. In particular, bedside clinicians who were not research oriented could not relate to the volumes of data presented, showing that some clinicians actually find difficulty in linking numbers to

actual patient care. Several suggestions about how to improve the process of audit and feedback in the ICU emerged. These included improved information sharing about the audit and feedback process and rationale for change, implementation of peer-to-peer discussions about quality improvement to avoid a top-down approach and more positive engagement in audit and feedback by senior management. Participants expressed a strong preference for direct face-to-face communication that would allow for education, discussion and feedback connected to specific patients. This study is a good example of the utility of qualitative research in healthcare. It gives a deep and rich understanding of the issues involved and shows us that audit and feedback is much more than the simple reporting of performance data. Although not IPC specific, it is definitely worth a read. It also incites us to take a good look at the audit and feedback methods our IPC teams are adopting.

Patient and public empowerment is a recurring theme in *Journal Watch*, for good reason. It is an area with huge, as yet largely untapped, potential, this next article explores the issue a little further than previously;

Seale H, Chughtai AA, Kaur R et al. (2015) Ask, speak up, and be proactive: Empowering patient infection control to prevent health care-acquired infections. *American Journal of Infection Control* 43: 447–453.

Several attempts have been made to empower patients to take on an active role in their own healthcare to ensure safe care. Indeed, to date empowerment programs have predominantly been directed at improving hand hygiene compliance among patients and hospital staff, with varying success. This study caught my attention as the authors set out to study the possibility of engaging patients with a wider range of infection control strategies beyond hand hygiene.

This small pilot, randomised controlled trial recruited 60 surgical patients in a major public hospital in Sydney, Australia. Patients were recruited postoperatively over a 4-month period from two surgical wards. The intervention group received the empowerment intervention, whereas the control group was not exposed to any additional material. The authors developed a flip chart and a brochure as empowerment tools; these covered two areas: healthcare-associated infections (HCAI) and the role the patient can play in preventing HCAI. These tools were then utilised with participants in the intervention group during a one-on-one consultation with a study investigator. At this time, information from the empowerment tools was verbally explained to the patients and any questions answered. A survey was used to collect data from all patients at baseline and after discharge. This assessed patient's knowledge, risk perceptions and attitudes toward HCAs and their willingness to ask HCWs questions about infection control

initiatives. Four different aspects of patient willingness were captured in the survey, including willingness to ask factual questions, ask challenging questions, refuse treatment and notify staff of issues related to their wound. At baseline, participants stated they were more willing to ask a doctor or a nurse a factual question than a challenging question. Patients also reported being highly willing to ask general questions about the signs and symptoms of infection but less likely to engage with staff and challenge them about their HH behaviours. Following the intervention, this study reported attempts by patients to be involved in their care and question HCWs however it showed that the method used for engaging patients was not adequate to empower them to actively play a role in preventing infection. Indeed, of the patients followed-up in the study, only three self-reported asking their HCW whether they had washed their hands. More robust patient engagement strategies, perhaps with better utilisation of visual and social media could achieve better results. This pilot study shows that although patients may be willing to be involved in reducing HCAs, they are not yet empowered or do not possess the necessary skills to actively intervene and challenge HCWs. As the authors conclude, for patients to engage with patient empowerment strategies, they must have sufficient knowledge of the problem and the role they can play to improve the situation. One strength of this study was that prior to data collection staff members were involved in mapping out the opportunities where patients could assist with preventing HCAs. This strategy could possibly help improve healthcare professional's acceptability of patient involvement initiatives. Overall this study points towards an area which requires further research, larger studies and more robust methodologies.

The final publication takes us back to more familiar literature. The authors of this paper from The Netherlands contribute to the recent debate that is questioning traditional thinking on Surgical Site Infection (SSI) surveillance:

Koek MB, Wille JC, Isken MR et al. (2015) Post-discharge surveillance (PDS) for surgical site infections: a good method is more important than a long duration. *Euro Surveillance* 20: pii:21042.

This study is based on data from the SSI surveillance system in The Netherlands. The authors are responding to the decision of the US Centers for Disease Control and Prevention (CDC) to reduce the duration of PDS for implant surgery. They also cite unpublished information from the European Centre for Disease Control (ECDC) in which a similar change is proposed. Their response was to review a large database of SSI surveillance data to identify the impact of two factors; reducing the duration of PDS and increasing the validity of the surveillance method used. The latter involved comparing a mandatory 'gold standard' and labour intensive method of PDS, with limited approaches

such as only checking for re-admissions. The ‘gold standard’ includes detailed follow-up of medical records which purports to identify SSI whether re-admitted or not and if admitted elsewhere. The authors had the results from over 100,000 procedures available to them; however 20,000 procedures were excluded from the analysis and it is not possible to know what, if any, bias this could have introduced to the results. The results themselves are quite mixed. Despite the large study size a number of the results had wide (non-significant) confidence intervals, suggesting that the study lacked statistical power for those outcomes. The headline results were that the absolute difference in SSI rates was very low when the PDS follow-up period for implant surgery was reduced from the traditional full year to 90 days. The results for non-implant surgery showed similarly small differences when reducing from 30 days to 21. For the different surveillance methods there were differences between the two methods, but these varied quite dramatically, both by type of surgery and between ‘deep’ and ‘superficial’ SSI types. Generally speaking, both methods identified ‘deep’ infections with the more intensive approach identifying more of the ‘superficial’ infections. The authors have concluded that the duration of PDS can be reduced for implant surgery but not for non-implant surgery and that the resources freed up could be used to support

more intense methods. These conclusions seem a bit too certain when their results are examined in detail and more studies would help to confirm their assertions. Finally, the data used were quite old, up to 2008, because after 2008 the more intensive approach became ‘mandatory’. A prospective study would help clarify the position.

The tools of our trade include; microbiology knowledge, audit and feedback, quality improvement methods, research and evaluation approaches, and of course many more. IPC practitioners can and must draw on a range of scientific and practice disciplines, as we hope this issue of Journal Watch has demonstrated.

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The authors declare that there is no conflict of interest.

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Reference

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