Antibiotic stewardship programmes—what’s missing?

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Inappropriate antibiotic use and antibiotic resistance are now major global issues. Antimicrobial stewardship programmes are increasingly being used to optimize antibiotic prescribing in acute care. The central tenet of these programmes tends to be policy and guidelines aimed at prescribers. However, rules and guidelines alone may not be sufficient to bring about effective and sustainable optimization of practice. Best practice needs to be positively reinforced by an environment that facilitates and supports optimal prescribing choices, i.e. a ‘choice architecture’ that makes prudent antibiotic prescribing the path of least resistance. To make prudent antibiotic management an integral part of the behaviour of all healthcare professionals and to bring about quality improvement it is necessary to adopt a whole-system approach. To do this it is necessary first to understand the factors that influence antibiotic management and prescribing.

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Antibiotic prescribing—a global concern

Inappropriate antibiotic use and the spread of resistance are now global issues. A harsh reminder of this is the rapid spread of the emerging multidrug-resistant bacteria producing New Delhi metallo-β-lactamase (NDM), which are spreading from the Asian subcontinent to Europe and currently showing potential to become a global infection problem.1 In an attempt to highlight the global dilemmas surrounding antibiotic use, the European Centre for Disease Prevention and Control (ECDC) has designated 18 November 2010 as European Antibiotic Awareness Day (EAAD). The goal of this initiative is to establish a wider awareness across Europe of the need to use antibiotics appropriately. This year the focus is on antibiotic use in hospitals.

It is widely accepted that there is a direct correlation between the use of antibiotics and development of antibiotic resistance.2,3 The effective dissemination to healthcare professionals of the significance of the intangible costs and collateral damage associated with antibiotic use remains one of the most compelling challenges. In addition to this, systems need to be developed that raise and sustain an awareness of the principles of prudent antibiotic use among healthcare professionals. One of the reasons for inappropriate prescribing stems from decisions made by prescribers working with poorly designed decision systems, for example poorly designed drug charts, and guidelines that are not up-to-date.4,5 In the case of antibiotics this leads to suboptimal decisions, for example a longer than necessary duration of therapy and the use of broad-spectrum agents where a narrow-spectrum agent would have been sufficient. To challenge these obstacles and optimize prescribing practice, the whole environment and systems around decision making for antibiotic prescribing need to be addressed.

Whole-system approach to optimizing antibiotic use

Prudent antibiotic prescribing can prevent the emergence of resistance6,7 and decrease the incidence of Clostridium difficile-associated disease.6,8 However, introducing rules alone, such as empirical guidelines and policy, is not sufficient to bring about the desired outcomes. For sustainable and effective adherence to best practice, prescribers need to be encouraged to internalize the principles that underpin optimized antibiotic prescribing. In addition, clinical judgement is often required to ascertain the most appropriate course of action for individual patients with complicated clinical scenarios, and occasionally this may result in decisions that legitimately overrule policy and guidelines. Therefore, healthcare organizations need to work towards sustainable systems that promote shared knowledge and provide prescribers with a choice architecture that prompts and facilitates prudent antibiotic prescribing.9

Effective and optimum antibiotic prescribing and management is a measured decision process requiring a fundamental understanding of the key principles of microbiology and the unwanted consequences of antibiotic use. Additionally, successful management of antibiotic therapy requires robust national and local information on usage of antibiotics to enable better understanding of the evolving relationship between antibiotic consumption and the emergence of resistance and prevalence of healthcare-associated infections (HCAIs).
Despite the recognized expertise required to prescribe antibiotics, in reality this decision process is often left to junior staff, who may or may not receive instruction from their seniors, who, although specialists in their own field, will not necessarily have the expertise required to make informed choices about antibiotic prescribing. There are now over 50 specialties in medicine, and medical microbiology and infectious diseases are only two of these. Patients admitted to hospital under any specialty will be at risk of presenting with, or acquiring, infections and may require prompt and targeted antimicrobial therapy. However, often only patients with complicated or severe infections will be referred to specialist medical microbiologist or infectious diseases teams, the majority being treated for their infection by non-specialists. This means that, unlike many other drugs, for which prescribing is kept within a specialty (for example antipsychotics or chemotherapy agents), antibiotics are prescribed universally by all doctors. As a result the quality of antibiotic prescribing may suffer, as prescribers (in an effort to ensure effective therapy and to cover the gaps that exist in their own knowledge) opt for broad-spectrum agents and longer than necessary durations of treatment. This practice has resulted in antibiotics being termed ‘drugs of fear’.

Furthermore, in the acute setting antibiotic prescribing may be influenced by prescribing etiquette, which often leads to prescribers being reluctant to alter their colleagues’ prescriptions, and in the context of the multidisciplinary nature of patient care in hospitals this may inevitably lead to lack of prescriber ownership for the antibiotic prescription. The sub-optimal prescribing decision process has led to widespread inappropriate use of antibiotics, with some studies estimating 25%–68% of hospital antibiotic prescribing to be suboptimal. To address this gap in knowledge and to support prescribers in their efforts to treat patients effectively, antimicrobial stewardship programmes need to advocate a multidisciplinary culture of shared knowledge in which all healthcare workers involved in antibiotic management understand and support the principles of prudent antibiotic prescribing.

Antimicrobial stewardship refers to the multifaceted approach (including policies, guidelines, surveillance, prevalence reports, education and audit of practice) that healthcare organizations have adopted to optimize prescribing. Essentially, antimicrobial stewardship advocates the use of the most suitable antibiotic in the context of the presenting clinical condition and specific patient. Successful antimicrobial stewardship programmes rely on coordination and collaboration between healthcare professionals to ensure consistency in approach, shared knowledge and widespread diffusion of practice.

Over the last 10 years the increasing profile of HCAIs, rising multidrug resistance and a diminishing pipeline of new antimicrobials have propelled the management of HCAIs into the forefront of the media and the political and public arena. This has in turn raised the profile of antimicrobial stewardship programmes within healthcare organizations, which are turning to initiatives that promote the better use of antibiotics in attempts to optimize care, minimize infections and address the inappropriate use of antimicrobials.

Despite the many recommendations on prudent antibiotic prescribing currently available in the UK, there is still no overarching recommendation for an antimicrobial stewardship framework and quality metrics for antibiotic prescribing have not been defined. The missing links in antimicrobial stewardship

To be able to develop effective and sustainable systems that ensure adherence to best practice, antibiotic stewardship programmes need to incorporate in their design an understanding of the cognitive biases that underpin prescribing behaviour. In this context, ‘choice architecture’ refers to being able to steer or nudge prescribers towards desired behaviour by shaping the working environment to make prudent antibiotic prescribing the default outcome. By providing choice to prescribers, their autonomy is not compromised and at the same time it is ensured that outcomes will be according to best practice. In addition to evidence-based hospital antibiotic guidelines and policies, it is necessary to consider the influence that other healthcare professionals have on prescribers. The UK is leading Europe in its use of trained specialist pharmacists as part of the antimicrobial stewardship programme. The specialist antibiotic pharmacist posts can help shape effective frameworks for optimized prescribing and support the multidisciplinary approach to care, and, building on this, it is now plausible to consider whether more should be invested in the training and education of nurses to bring promotion of prudent antibiotic prescribing into the compass of their profession. The responsibility of antibiotic prescribing remains primarily with junior non-expert doctors who represent the most mobile workforce within acute care. Therefore, to shift behaviour, support adherence and provide consistency and sustainability of best practice, the nursing profession in addition to pharmacy needs to be encouraged to take on a more proactive role in antimicrobial stewardship programmes.

The current programmes around antibiotic prescribing that focus on recommendations, guidelines and policy as key influences on prescribing behaviour need also to consider effective systems that nudge prescribers to make prescribing decisions in a way that is beneficial both to the patient being treated and also to wider public health by having least risk of collateral damage. To achieve and sustain this shift in prescribing behaviour and make optimal antibiotic prescribing the default outcome, healthcare professionals need to be involved in the decision-making process to ensure that the resulting systems that shape and guide decisions are multidisciplinary. The development of well-designed decision systems to prompt and support desired antibiotic prescribing practice should be an essential tenet of antimicrobial stewardship programmes.

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Transparency declarations

A. H. and J. C. are members of the Department of Health Advisory Committee for Antimicrobial Resistance and Healthcare Associated Infection (ARHAI). J. C. is Chair of the Prescribing sub-group of that committee. He is a member of the Persons Appointed Panel for the Regulation of
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