Implementation of antibiotic prescribing guidance

A study of Public Health England’s ‘Start smart − then focus’ antibiotic prescribing toolkit concluded that most hospital antibiotic policies in England ‘start smart’ by recommending broad-spectrum antibiotics for empirical therapy in severe infections. However fewer ‘focus’ by reviewing the ongoing need for antibiotics after a couple of days, as recommended.

Overview: Appropriate use of antibiotics is important to reduce the serious threat of antibiotic resistance and the risk of healthcare-associated infections such as *Clostridium difficile*. The concept of antimicrobial stewardship was developed to support optimal prescribing of antimicrobials, prevent overuse, misuse and abuse, and minimise development of resistance at patient and community levels. The term ‘antimicrobial’ includes antifungal, antiviral, and antiparasitic drugs as well as antibacterial drugs (more commonly known as antibiotics).

Healthcare professionals should ensure prescribing is in line with NICE guidance, Public Health England’s guidance for primary care on managing common infections, the organisation’s toolkit for secondary care ‘Start smart − then focus’, and local trust antibiotic guidelines. The total volume of all antibiotic prescribing and broad-spectrum antibiotic prescribing in primary and secondary care should be reviewed against local and national data.

The NICE key therapeutic topic on antibiotic prescribing – especially broad spectrum antibiotics summarises the issues around antibiotic prescribing and is supported by the NICE evidence summary: medicines and prescribing briefing on *Clostridium difficile infection: risk with broad-spectrum antibiotics*.

Current advice: Public Health England’s ‘Start smart – then focus’ toolkit outlines best practice in antimicrobial stewardship in the secondary care setting.

‘Start smart’ states that antibiotics should be started within 1 hour of diagnosis (or as soon as possible) in people with severe and life-threatening infections (particularly where the cause of infection is uncertain), in line with local antibiotic prescribing guidance. In people with less severe infection, local prescribing guidance should recommend narrow-spectrum antibiotics that cover the expected pathogens.

‘Focus’ states that the clinical diagnosis and continuing need for antibiotics should be reviewed within 48–72 hours, with 5 options to consider:
• stop antibiotics if there is no evidence of infection
• switch antibiotic formulation from intravenous to oral
• change antibiotic – ideally to a narrower spectrum, but broader if required
• continue antibiotics and document next review date
• start outpatient parenteral antibiotic therapy.

NICE has produced several guidelines relating to healthcare-associated infections and antibiotic prescribing, including NICE guidelines on respiratory tract infections – antibiotic prescribing and pneumonia. The NICE pathways on self-limiting respiratory tract infections – antibiotic prescribing and pneumonia bring together all related NICE guidance and associated products on the 2 areas in sets of interactive topic-based diagrams.

NICE is also developing guidelines on antimicrobial stewardship (publication expected July 2015) and antimicrobial stewardship – changing risk-related behaviours (publication expected March 2016).

New evidence: Llewelyn et al. (2014) surveyed specialist antibiotic pharmacists in acute hospital trusts in England about empirical treatment of common infections (‘start smart’) and antibiotic prescription reviews (‘focus’). The infections assessed were community- and hospital-acquired pneumonia, pyelonephritis, community-acquired abdominal sepsis and severe sepsis. Antibiotics were categorised as broad spectrum (cephalosporins, quinolones, carbapenems and penicillin combination antibiotics, such as co-amoxiclav and piperacillin-tazobactam) or narrow spectrum (penicillin, amoxicillin, aminoglycosides, doxycycline and trimethoprim). Rates of C difficile infection were obtained from the national mandatory surveillance system.

A total of 105 of the 145 trusts contacted responded to the survey (response rate=72%). Broad-spectrum penicillin combination antibiotics were commonly recommended in hospital trust antibiotic policies for the infections assessed. A substantial number of responding trusts recommended narrow-spectrum antibiotics first line for community-acquired pneumonia (42/105 [40%]) and pyelonephritis (50/105 [48%]). Very few trusts recommended quinolones or cephalosporins for first-line treatment.

Across the indications, 18–28% of policies from responding trusts recommended giving first-line antibiotic treatment for 24–48 hours only. The most commonly recommended treatment duration for community- and hospital-acquired pneumonia, pyelonephritis and community-acquired abdominal sepsis was 7 days or more. Nearly all trust policies (100/105 [95%]) recommended antibiotic prescription reviews, but less than half of the trusts that provided details on reviews (46/96 [48%]) reported monitoring compliance.

Trusts with policies recommending broad-spectrum antibiotics for community-acquired pneumonia had significantly higher rates of C difficile infection than those that recommended narrow-spectrum antibiotics (p=0.06). No increased risk of C difficile was seen with broad-spectrum antibiotics compared with narrow-spectrum antibiotics for other infections assessed in the study.

The study has several limitations. It is possible that the 40 trusts (28%) that did not respond to the survey were less engaged in antimicrobial stewardship than those that did respond. Also, trusts with high rates of C difficile may have introduced antibiotic prescribing policies with greater use of narrow-spectrum antibiotics, which may have reduced the relationship between broad-spectrum antibiotics and rates of C difficile. It is also possible that trust antibiotic policies may not reflect actual use of antibiotics within the organisations.

Commentary: “Antimicrobial resistance remains a major clinical and public health issue. Antimicrobial use is a key driver of resistance. Antimicrobial stewardship, an organisational or healthcare-system-wide approach to promoting and monitoring judicious use of antimicrobials, will help to preserve their future effectiveness (Department of Health 2013). The 3 goals for an effective antimicrobial stewardship programme are:

• Optimising therapy for the individual patient
• Preventing overuse, misuse and abuse
• Minimising development of resistance at patient and community levels (Doran 2011).

“The study by Llewelyn et al. (2014) highlighted that most hospital trust policies recommended using antibiotics for at least 7 days for most indications and less than 50% of trusts monitored 48–72 hour review of antibiotic prescriptions. Such recommendations of at least 7 days of antibiotics for most indications could lead to unnecessary use of broad-spectrum antibiotics. This could increase the risk of C difficile if better systems are not put in place to improve treatment focus at 48–72 hours, as recommended by the ‘Start smart − then focus’ antimicrobial stewardship toolkit.

“The drive to reduce the number of C difficile infections and the risk of antibiotic resistance across the NHS has led to reduced use of cephalosporins and quinolones in recent years; this is reflected in the published data by Llewelyn et al. (2014). In the study, cephalosporins and quinolones were recommended in less than 6% of trust guidelines and only for upper and catheter-associated urinary tract infections. However, co-amoxiclav, potentially a high risk antibiotic for C difficile infection from observational data, was commonly recommended.

“Similarly, a survey of antimicrobial stewardship activities in 2014 by the English Surveillance Programme for Antimicrobial Utilisation and Resistance (ESPAUR) showed that for 10 common infections, co-amoxiclav was 1 of the top 5 antibiotics recommended in trust guidelines. Cephalosporins and quinolones were recommended in less than 2% of trust guidelines. Antimicrobial consumption data reported by ESPAUR highlighted that between 2010 and 2013, co-amoxiclav use increased by 13%, piperacillin-tazobactam by 46% and carbapenems by 31%.

“It is clear that many English hospital trusts are starting smart with their recommended antibiotic prescribing guidelines. However, greater emphasis is required on implementing and monitoring the focus element of ‘Start smart – then focus’ to reduce unnecessary use of broad-spectrum antibiotics.”


Study sponsorship: This study was not funded.

About this article: This article appeared in the June 2015 issue of the Eyes on Evidence newsletter. This free monthly newsletter from NICE Evidence Services outlines interesting new evidence and what it means for current practice. The articles do not constitute formal NICE guidance. The commentaries included are the opinions of contributors and do not necessarily reflect the views of NICE.

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