

## Should Automatic Stop-Order Policies be Used in Hospitals to Promote Rational Use of Antibiotics?

### THE "PRO" SIDE

The activation of an automatic stop-order (ASO) policy can result in premature discontinuation of a patient's medication, as can occur because of other aspects of the medication delivery system.<sup>1</sup> However, several provincial laws and national pharmacy organizations have endorsed ASO policies in hospitals to ensure that drugs are discontinued when they should be.<sup>2,3</sup> The major goals of an ASO policy can be defined as follows:

- encourage reassessment of a patient's clinical condition and response to drug therapy
- review the response to therapy on the basis of laboratory, microbiology, and diagnostic imaging reports
- reassess the need for continuation, change, or discontinuation of pharmacotherapy
- encourage safe and rational drug use by preventing unreasonable and prolonged use of drugs

It has been estimated that up to 50% of antibiotic usage in the hospital setting is inappropriate.<sup>4</sup> Several institutions and authorities have indicated that overuse of antibiotics results in antimicrobial resistance and have called urgently for policies to address this issue.<sup>5,6</sup> A systematic review of 66 studies concluded that well-defined interventions aimed at improving antibiotic prescribing are successful and can reduce antimicrobial resistance and hospital-acquired infections.<sup>4</sup> One such intervention is the ASO policy. Many institutions promote the use of ASOs, among other methods (e.g., antibiotic restrictions and antibiotic order sheets), as an effective strategy to promote judicious antibiotic use.<sup>7,8</sup>

Published reports have described successful use of an ASO policy as a powerful institutional tool for controlling overuse of antibiotics.<sup>9,10</sup> For example, enforcement of an ASO policy, in combination with an extensive education program for physicians and nurses, resulted in a 6% decrease in antibiotic prescriptions in one institution.<sup>10</sup> However, implementation of an ASO policy is not without risks, and the negative consequences of omitting stop dates has also been documented. At one Canadian hospital, the number of antibiotic orders with prolonged duration increased when an ASO policy was stopped.<sup>11</sup> The percentage of patients with prolonged duration of antibiotic therapy (more than 9 days) was 11.8% for those with a 7-day ASO, 17.2% for those with no ASO, and 15.6% for those with a 5-day ASO.<sup>11</sup> The authors concluded that an ASO policy should provide sufficient time and notice to allow information (e.g., laboratory results, patient response) to be gathered, so that clinicians can make decisions with a high degree of confidence.

To determine the appropriate duration of antibiotic therapy and the most appropriate ASO stop-date requires consideration of epidemiologic and patient factors. For example, for intra-abdominal infections, the recommended duration of antimicrobial therapy is 5 to 7 days or less.<sup>12</sup> Certain guidelines clearly spell out the need to evaluate source control, identify any new focus of infection, and investigate the presence of resistant organisms if there is lack of satisfactory response after 7 days of treatment.<sup>13</sup> The need for patient assessment is key but may not occur if there is no forced mechanism for feedback and assessment.

Why are antibiotic stop dates so variable among different institutions (e.g., 3 days, 5 days, 7 days, or 10 days)? Often, shorter stop dates are applied to drugs with restrictions; they are meant to encourage review and follow-up by specialists, usually in a teaching or tertiary care setting. A 7-day ASO is the most commonly applied standard for antibiotic orders. Some institutions are opting for longer stop dates for HIV/AIDS medications and antifungal treatments, while maintaining a 7-day ASO for other anti-infective agents. At institutions with a "no-ASO" policy, there is a well-defined role for clinical pharmacists who perform reassessment and follow-up on antimicrobial therapy.<sup>11</sup> Authorizing pharmacists to continue or stop antibiotic therapy under well-controlled protocols or circumstances has been suggested as a useful strategy for controlling antibiotic use.<sup>3</sup> Clinical pharmacists with appropriate training and experience are capable of this task. However, many hospitals face the difficult issue of lack of adequately trained staff; in particular, the current shortage of clinically trained pharmacists makes it difficult for hospital pharmacy managers to guarantee this role with any degree of assurance.

In this age of technological advances, automation has allowed the efficient implementation of ASO policies that can be tailored to specific drugs or drug classes, as well as providing 24-h to 48-h warnings. Such warnings can appear in the medication administration record and many other reports.

On balance, the evidence suggests that ASO policies have their place in medication systems in hospitals. During these times of shortages of qualified pharmacy, nursing, and medical staff, an ASO policy reinforces messages about pharmacovigilance and timely medication reassessment. Any ASO policy should clearly define the roles of the nursing and medical staff in the successful operation of the policy, with the aim of ensuring appropriate discontinuation of medications when therapy is no longer required. Until we have more clinical pharmacists on the wards, preferably with expanded authority to discontinue, change, and modify orders, there is a place for the ASO in our institutions. Let's not close the book on it!



## References

1. Cleary JD, Taylor JW, Nolan RL. Automatic stop-order procedure for antibiotics needs evaluation [letter]. *Am J Hosp Pharm* 1991; 48(12):2602,2604.
2. Bylaw 8: Hospital pharmacy. Section 85: Patient record and medication order review. In: *Bylaws of the Council of the College of Pharmacists of British Columbia*. Vancouver (BC): College of Pharmacists of British Columbia; [cited 2007 Sep 20]. Available from: <http://www.bcpharmacists.org/legislation/provincial/bylaws/>
3. ASHP Pharmaceutical Services. Urgent-HCFA proposes new hospital conditions of participation [press release]. Bethesda (MD): American Society of Health-System Pharmacists; 1998 [cited 2007 Sep 19]. Available from: [http://www.ashp.org/s\\_ashp/article\\_press.asp?CID=168&DID=2023&id=195](http://www.ashp.org/s_ashp/article_press.asp?CID=168&DID=2023&id=195)
4. Davey P, Brown E, Fenelon L, Finch R, Gould I, Hartman G, et al. Interventions to improve antibiotic prescribing practices for hospital inpatients. *Cochrane Database Syst Rev* 2005;(4):CD003543.
5. Gould IM, Jappy B. Trends in hospital antimicrobial prescribing after 9 years of stewardship. *J Antimicrob Chemother* 2000;45(6):913-917.
6. Lesar TS, Briceland LL. Survey of antibiotic control policies in university-affiliated teaching institutions. *Ann Pharmacother* 1996;30(1):31-34.
7. Guglielmo BJ. Practical strategies for the appropriate use of antimicrobials. *Pharm World Sci* 1995;17(4):96-102.
8. Lawton RM, Fridkin SK, Gaybes RP, McGowan JE Jr. Practices to improve antimicrobial use at 47 US hospitals: the status of the 1997 SHEA/IDSA position paper recommendations. *Infect Control Hosp Epidemiol* 2000;21(4):256-259.
9. Blondel-Hill E, Fryters S. Antimicrobial utilization: Capital Health Region, Alberta. *Can J Infect Dis* 1998;9 Suppl C:26C-29C.
10. Zobebein E, Levy M, Greenwald RA. The effect of quality assurance review on implementation of an automatic stop-order policy. *QRB Qual Rev Bull* 1982;8(8):12-17.
11. Engels DR, Evans GA, McKenna SM. Effect on duration of antimicrobial therapy of removing and re-establishing an automatic stop date policy. *Can J Hosp Pharm* 2004;57(4):214-219.
12. Blot S, De Waele JJ. Critical issues in the clinical management of complicated intra-abdominal infections. *Drugs* 2005;65(12):1611-1620.
13. Mazuski JE, Sawyer RG, Nathens AB, DePiro JT, Schein M, Kudsk KA, et al. The Surgical Infection Society guidelines on antimicrobial therapy for intra-abdominal infections: an executive summary. *Surg Infect (Larchmt)* 2002;3(3):161-173.

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## THE "CON" SIDE

As far back as 1975, the need for an automatic stop-order (ASO) policy has been questioned.<sup>1</sup> Proponents have suggested that such policies promote rational and effective use of antimicrobials, reduce antimicrobial resistance, protect the patient from harm, and protect the payer (be that the patient or the institution) from unnecessary expense.<sup>2,3</sup> However, it can be easily argued that ASO policies for antimicrobials may actually have the opposite effects.

No evidence exists that ASO policies improve the rational use of antimicrobials. Ensuring that the duration of antimicrobial therapy does not extend beyond a predetermined number of days may limit drug costs, but it does little to promote rational use. Rather, rational antimicrobial therapy calls for the minimum duration of administration necessary to obtain the desired clinical outcome, usually cure. Determination of that minimum duration of therapy requires assessment by the individual patient's health care team at a frequency that allows for sound, clinically based decisions regarding continuation or discontinuation of therapy. In contrast, a strictly enforced ASO policy may demand reassessment of antimicrobial therapy at an inappropriate time by clinicians unfamiliar with the patient. Many institutions attempt to minimize the potential for ASO policies to result in premature discontinuation of therapy by providing the clinicians with one or more warnings. However, our local experience suggests that these warnings are not commonly noticed and, furthermore, that the ASO notice plays no role in ensuring the shortest clinically effective course of antibiotic therapy. While attempting to prevent oversights associated with prolonged courses of antimicrobial therapy, the ASO policy may inadvertently produce oversights associated with inappropriate discontinuation of antibiotics, at the patient's expense. If ASO notifications are missed by the health care team, essential antibiotic therapy may be prematurely discontinued without achieving the desired clinical outcome. Cleary and others<sup>4</sup> described 5 patients for whom an antibiotic ASO policy and procedure contributed to premature discontinuation of therapy. Treatment withdrawal was believed to have contributed to one patient's death and to prolongation of the hospital stay in the other 4 cases.<sup>4</sup> The antibiotic ASO policy at the authors' institution was discontinued in favour of other methods of providing rational and effective drug therapy. In 2003, the Institute for Safe Medication Practices (US) reported a near miss involving the premature discontinuation of nafcillin in a patient with endocarditis.<sup>5</sup> Any policy that might increase the frequency of errors of omission should be assessed critically.

One purported benefit of an ASO policy is improved documentation of the rationale for continuation or discontinuation of therapy.<sup>4</sup> It can be argued that poor documentation is just as likely to be the result, particularly if the ASO notification is not a permanent component of the health care record. The ASO notifications at our institution were never considered a permanent addition to the patient's health care record. Therefore, the reason for automatic discontinuation and non-administration of an ordered antibiotic through enforcement of an ASO policy was not stated in the patient's medical record. The order could simply disappear from the medication administration record.

What about reducing the rate of antimicrobial resistance? ASO policies do not improve on the estimated 50% rate of initially inappropriate courses of antimicrobial treatment.<sup>3</sup> There exists no high-level evidence that policies to control antibiotic use, including ASOs, reduce the rate of antimicrobial resistance. Intensive study would be required to tease out the effect of ASO policies relative to other strategies on resistance rates.

Believing that the disadvantages outweighed the advantages, we eliminated the 7-day ASO on antimicrobials at our institution in July 2000.<sup>6</sup> Disappointingly, an audit



performed 1 year later demonstrated a statistically significant *increase* over the baseline value in the proportion of antimicrobial courses lasting more than 8 days (17.2% and 11.8%, respectively). We theorized that this was the result of prescribers specifying longer durations of antibiotic therapy in their initial orders, rather than writing open-ended orders that would require a discontinuation order at a later date. The elimination of the ASO policy occurred at a time of increased pharmacist vacancies, so pharmacists were less able to contribute to the assessment of duration of antibiotic therapy.

We responded to this troubling finding by reinstating a 5-day ASO, perhaps a more-than-reasonable point at which to reassess most courses of antibiotic therapy. Surprisingly, the duration of courses of antimicrobial therapy did not decrease to even pre-intervention norms: the proportion of courses longer than 8 days was statistically significantly higher than when the 7-day ASO was in place (15.6% and 11.8%, respectively).

With a patient care and safety focus in mind, we again eliminated the antibiotic ASO policy and explored alternative methods of facilitating rational antimicrobial therapy. Our efforts have included providing pharmacists with a list of patients who are receiving ongoing antimicrobial therapy, with an expectation that the pharmacists will review the list with the health care team. In addition, we have improved prescriber access to pharmacy-maintained patient medication profiles and the utilization of preprinted physician orders (to allow more structured information on which to base the duration of antibiotic therapy). Efforts to limit the postoperative use of antimicrobial prophylaxis in the surgical setting to a maximum of 24 h have helped enormously to contain the duration of antimicrobial therapy in this patient population, which was previously at high risk of excessive use.

We have not yet re-audited the duration of antimicrobial therapy at our institution, but we believe that our current processes are allowing for the exercise of clinical judgement without introducing any significant risk of inadvertent, premature discontinuation of antimicrobial therapy.

#### References

1. Garrison TJ, Puckett CF. The automatic stop order—Is it still needed? [letter]. *Am J Hosp Pharm* 1975;32(10):994.
2. Larson EL, Quiros D, Giblin T, Lin S. Relationship of antimicrobial control policies and hospital and infection control characteristics to antimicrobial resistance rates. *Am J Crit Care* 2007;16(2):110-119.
3. Lesar TS, Briceland LL. Survey of antibiotic control policies in university-affiliated teaching institutions. *Ann Pharmacother* 1996;30(1):31-34.
4. Cleary JD, Taylor JW, Nolan RL. Automatic stop-order procedure for antibiotics needs evaluation [letter]. *Am J Hosp Pharm* 1991; 48(12):2602,2604.
5. ISMP medication error report analysis: unintended discontinuation of drugs. *Hosp Pharm* 2003;38(9):727-728.
6. Engels DR, Evans GA, McKenna SM. Effect on duration of antimicrobial therapy of removing and re-establishing an automatic stop date policy. *Can J Hosp Pharm* 2004;57(4):214-219.

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