Antimicrobial resistance: Journey without end

The theme for the original articles in this issue is antimicrobial resistance. Scriver et al (pages 76-82) report on an in vitro cross-Canada review of activity of selected antimicrobials against nosocomial Gram-negative rods, particularly organisms with inducible chromosomal beta-lactamase. Loo et al (pages 83-87) describe activity of selected antimicrobials against susceptible and intermediate penicillin-resistant Streptococcus pneumoniae isolated in Quebec. Burdge et al (pages 97-101), in Vancouver, describe eradication of pulmonary methicillin-resistant Staphylococcus aureus (MRSA) with clindamycin and rifampin in two cystic fibrosis patients.

Antimicrobial resistance is here—a current and future challenge for Canadian physicians and their patients. Some comfort is found in observing that the extent of resistance seems less than those reported from other countries. For instance, as Scriver et al demonstrate, Klebsiella pneumoniae plasmid-mediated beta-lactamase resistance is not yet a problem in Canada, and vancomycin-resistant enterococci are not yet established. The emergence of MRSA (1) and penicillin-resistant S pneumoniae (see Loo et al) as important clinical problems has been delayed relative to many other countries. Perhaps our widely scattered population impedes transmission, or our antimicrobial and infection control practices are of a calibre that limits acquisition and dissemination of resistant organisms. There is no reason for complacency; the only realistic future is one of escalating antimicrobial resistance.

How should we respond to reports of increasing antimicrobial resistance in Canada? Generally, a threefold front is suggested (2). First, new antimicrobials that circumvent current mechanisms of resistance may be developed. This, of course, is the history of anti-microbial introduction and resistance development of the past four decades. But in antimicrobial development, the distance between the antimicrobial being sought and the pursuing resistance is ever shortening. There may remain unexploited opportunities for antimicrobial development, but a sanguine expectation of scientific progress may be naive—the extraordinary adaptability of microorganisms is certainly cautionary.

The second approach is to ensure ‘optimal’ use of current antimicrobials. But can we agree on what is optimal antibiotic use? Is it using less of an antimicrobial, as suggested by the experience with vancomycin-resistant enterococcal outbreaks in the United States, or is it using more, as in ensuring full treatment of tuberculosis cases or eradication of MRSA carriage? In some settings, such as high intensity specialty care units in tertiary care hospitals (e.g., burn or hematology/oncology units), even optimal antimicrobial use will be associated with emergence of antimicrobial resistance. In addition, available reports describing interventions to modify antimicrobial use are, short of restriction, a saga of failure. Some promising but preliminary initiatives, primarily at the family practice level, are exploring the facilitation of implementation of practice guidelines. These may provide some future models of practice intervention applicable to the difficult problem of achieving ‘appropriate’ antimicrobial use. There are, however, no immediately apparent short term solutions.

The third suggested approach for managing antimicrobial resistance is through strengthening infection control practices. This approach would be targeted to institutional settings, where the goal is to prevent the interpatient transmission of organisms among patients, which is facilitated in the institutional setting. Reports of control of nosocomial outbreaks of multiply resistant tuberculosis and vancomycin-resistant enterococci are convincing evidence that appropriate, intensive, infection control practices are effective in preventing transmission of resistant organisms. These success stories, however, emerge from crisis situations. The dual challenges of resource limitation and of managing human behaviour are substantial impediments, in the non-crisis situation, to the effectiveness of infection control measures in managing endemic antimicrobial resistance.

This is not, however, a time for pessimism. We must get past number counting and handwringing to action and commitment. It is time for a dispassionate, realistic appraisal of the problem, and acknowledgement that we are embarking on hostilities that will shadow the remainder of our professional careers. The measurement of the impact of resistance, in particular, is critical to the development of strategies for management of antimicrobial resistance. How much is it an in vitro phenomenon? What are the clinical morbidity, mortality and cost to our society of antimicrobial resistance? This information is essential to allow us to prioritize competing issues, to measure the impact of interventions, and to understand the trade-offs in clinical management and professional independence necessary in managing this problem of antimicrobial resistance. Our immediate and long term goal is to maintain the
substantial benefits that effective antimicrobial therapy has provided to our population over the past four decades.

REFERENCES
1. Embil J, Ramotar K, Romance L, et al. Methicillin resistant Staphylococcus aureus in tertiary care institutions on the Canadian prairies 1990-1992. Infect Control Hosp Epidemiol 1994;15:646-51.

All-inclusive text on candidiasis
Candidiasis: Pathogenesis, Diagnosis and Treatment, 2nd edn, edited by Gerald P Bodey (1993). Raven Press, Ltd, 1185 Avenue of the Americas, New York, New York 10036, USA. 432 pages, US$95.00

Infections caused by Candida species have emerged as a prominent entity in the latter part of the 20th century. This trend is exemplified by candidemia, which was considered to be rare 40 years ago, but today assumes a significant role as a nosocomial infection. The increasing role of both superficial and systemic candida infections is directly related to the mushrooming population of immunocompromised patients with cancer, organ transplantation, AIDS and on long term immunosuppressive agents.

Writing a textbook on the pathogenesis, diagnosis and treatment of candidiasis is a daunting task. In his second edition on this subject, Dr Gerald Bodey has assembled an array of prominent experts in their respective fields. The compilation of their work is a book that is generally well written and full of pertinent information about candidiasis. The editor has divided the book into sections on the microbiology of Candida species, pathological correlations, epidemiology of candidiasis, laboratory diagnosis, radiological features, clinical manifestations of candida syndromes and, finally, therapeutic options. There are sections of the text, however, that are poorly organized and that present data superficially.

Worthy of praise are the chapters Biology and Pathogenicity, Pathogenesis, Epidemiology, Laboratory Diagnosis, Oral Candidiasis, Genital Candidiasis, Neonatal Candidiasis, Hematogenous and Organ Candidiasis, Candida Ophthalmitis and Central Nervous System Infection, and Antifungal Agents that summarize the state of the art of these subjects. The inclusion of data on candida hypersensitivity syndrome exemplifies the all-inclusive nature of this book.

However, the chapters describing pathological correlations and animal models are superficial and lack the insight one would expect in this type of book. The presentation of the radiological features of candida infections is poorly organized. It is formulated along a radiographic organ system approach rather than according to clinical syndromes. The lateral approach may have proven more useful to clinicians. The authors failed to detail the advantages of one radiographic procedure compared with another in the diagnosis of candidiasis. The use of sensitivity and specificity measures would have been beneficial for the reader in deciding which investigative procedure is warranted. The authors’ report on cutaneous candidiasis is also superficial. Particularly deficient is the treatment of cutaneous candidiasis, although this topic is covered in more detail in a later chapter on antifungal agents. In addition, the chapter on urinary candidiasis should have been expanded to include the current thought on candiduria in intensive care unit patients and the predisposition of these patients to systemic candidiasis. Some thoughts on colonization with Candida species in the intensive care unit setting and the concomitant effect of this colonization on mortality would have been welcome. The inclusion of prophylactic antifungal trials currently underway to prevent candida colonization in this clinical setting would have been prudent. Finally, on more than two occasions, the content of one chapter overlapped with that of another.

Despite its flaws, the second edition of Candidiasis: Pathogenesis, Diagnosis and Treatment offers a comprehensive look at this emerging subject. It is a worthwhile addition to one’s library and serves as a jumping off point for the clinician desiring to probe further into the ever expanding field of clinical mycology.

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