

# Canadian Medication Optimization Briefing

## Antimicrobial Stewardship

### PATIENT EXPERIENCE

Despite coverage of antimicrobial resistance in the news media, many patients are not aware of the limitations and adverse effects associated with antibiotics, such as *Clostridium difficile* diarrhea. Patient and caregiver requests may contribute to unnecessary prescribing of antibiotics. Recently, there have been efforts to educate the public on the consequences of multidrug-resistant infections and to educate patients on how to use antibiotics wisely.

### STEPS YOU CAN TAKE

- It is good practice to educate patients and their caregivers on the role and limitations of antibiotics (e.g., antibiotics cannot be used to treat viral infections).
- In the institutional setting, pharmacists may lead or participate in the development of local guidelines for empiric management of common infections.
- In both outpatient and inpatient settings, include the patient's goals of care in the assessment of antibiotic needs.
- Ensure that the patient's best possible medication history (BPMH) includes antibiotic use for the past 3 to 12 months.
- Confirm the patient's allergy status and clarify any unclear history of reactions. Ensure that allergy status is documented in the patient's health record and provide patient education as appropriate.

### PRACTICE MODEL

An interdisciplinary approach, with strong interprofessional collaboration, is key to successful antimicrobial stewardship because clinical decision-making requires effective interprofessional communication.

### STEPS YOU CAN TAKE

- Assess individual antimicrobial prescriptions on the basis of:
  - intended indication
  - empiric spectrum of activity
  - dose, frequency, route of administration
  - duration of therapy
  - microbiology test results
  - patient-specific factors, such as organ function, allergies, history of exposure to antimicrobials, and colonization or infection with resistant organisms
  - patient's risk of adverse events due to the antimicrobial (e.g., *C. difficile* infection)
- Recommend interventions, such as:
  - appropriate selection of empiric therapy for the intended indication
  - tailoring of the antimicrobial regimen based on investigation results, pharmacokinetic and pharmacodynamic properties, and the patient's clinical status
- Participate in formulary management, and lead development of local treatment guidelines.

### STEWARDSHIP

Recent literature has focused on a "shorter is better" approach by determining the shortest duration of effective therapy (e.g., in pneumonia, intra-abdominal infections, and urinary tract infections).

Antimicrobial stewardship interventions should be tailored to the prescribers' needs, the institution's resources, and the patient population. Examples of tailoring include development of guidelines and clinical pathways specific to the local setting, and use of susceptibility testing and reporting in formulary management.

Guidelines and clinical pathways should also consider how to eliminate or reduce potential sources of infection.

### STEPS YOU CAN TAKE

- Make assessing the use of antimicrobials part of routine pharmacotherapy workup.
- Identify patients whose antimicrobial therapy can be tailored, and make recommendations accordingly.
- Encourage prescribers to determine a timeline for reassessing empiric therapy, on the basis of microbiology results and the patient's clinical status.
- Identify the antimicrobial agent that provides the most appropriate spectrum of activity for the infection. For most patients, this targeted therapy will be the drug with the narrowest spectrum for the identified causative pathogen.
- Once targeted therapy has been initiated, encourage the prescriber to specify the duration of therapy. For most patients, this will be the shortest effective duration possible.

### PARTNERS

Judicious and safe use of antimicrobials applies to all patients, and it is the collective responsibility of all healthcare providers to ensure that it takes place.

The core team should include a pharmacist and a physician. Important partners and collaborators include nonphysician prescribers, nurses, a microbiologist, an infection control practitioner, and local champions for the antimicrobial stewardship cause. Patients and their caregivers are also important to antimicrobial stewardship. Support from hospital administrators is imperative if the antimicrobial stewardship program is to be successful.

### STEPS YOU CAN TAKE

- In the institutional setting, create an antimicrobial stewardship program that has an established reporting infrastructure, with clear leadership support and sponsorship.
- Outside of the antimicrobial stewardship program, collaborate and interact with the primary clinical team, or the primary prescriber, to meet each patient's antimicrobial needs.
- At discharge, work with community partners to ensure seamless care (e.g., clearly communicate duration of therapy or changes to allergy status).
- Continually monitor and report antimicrobial use to all key stakeholders as a quality improvement metric.

## CASE STUDIES

An 82-year-old woman is sent to the emergency department from her long-term care facility for suspected urinary tract infection (UTI). Her oral intake has decreased over the past 24 hours, and her care provider at the facility reported cloudy and foul-smelling urine. The patient is afebrile but appears dehydrated. Urine culture shows growth of *Enterococcus faecalis*. As a pharmacist, what would you recommend for this patient?

Antimicrobial stewardship pearls:

- Decreased oral intake and other changes to an elderly patient's clinical status require a thorough workup. Clinicians should not assume that these changes are due to a UTI.
- Changes in the appearance and smell of urine should not be assumed to be signs of UTI.
- The results of urine culture should be interpreted in conjunction with clinical symptoms and results of urinalysis.
- Asymptomatic patients with positive urine culture results (i.e., asymptomatic bacteriuria) should not be treated with antibiotics, except those who are pregnant and those patients undergoing urologic or gynecologic surgery.

## TIPS FOR SUCCESS

- Always acknowledge and address the concerns of the prescriber and the patient regarding the decision on antimicrobial therapy.
- Encourage collaborative efforts, which are essential to the success of antimicrobial stewardship interventions.
- Avoid claiming early victory (or early defeat) in improving antimicrobial consumption without scrutinizing the validity of the data.
- The choice of data for reporting will depend on available data infrastructure, ease of access, and validity. For example, "antimicrobials dispensed" may be a reasonable metric in some institutions, but where electronic medication administration records (e-MARs) are available, patient-level data on "antimicrobials administered" are preferred.
- Tailoring stewardship communications to meet the audience's needs is important for building strong interprofessional relationships.
- Educational strategies (e.g., group presentations) are of adjunctive benefit when incorporated into a multifaceted approach, but ought not to be the sole strategy if the goal is a sustainable change in prescribing practice.

## RESOURCES FOR PATIENTS

- Do Bugs Need Drugs? [www.dobugsneeedrugs.org](http://www.dobugsneeedrugs.org)
- National Collaborating Centre for Infectious Diseases: [www.nccid.ca/antibiotic-awareness](http://www.nccid.ca/antibiotic-awareness)
- Antibiotic prescribing and use in doctor's offices (US Centers for Disease Control and Prevention): [www.cdc.gov/antibiotic-use/community/for-patients/](http://www.cdc.gov/antibiotic-use/community/for-patients/)
- Antibiotic resistance awareness materials (Public Health Agency of Canada): [www.canada.ca/en/public-health/services/antibiotic-antimicrobial-resistance/antibiotic-resistance-awareness-materials.html](http://www.canada.ca/en/public-health/services/antibiotic-antimicrobial-resistance/antibiotic-resistance-awareness-materials.html)
- Antibiotic resistance project (The Pew Charitable Trusts): [www.pewtrusts.org/en/projects/antibiotic-resistance-project](http://www.pewtrusts.org/en/projects/antibiotic-resistance-project)
- Choosing Wisely: [www.choosingwisely.org/patient-resources/antibiotics/](http://www.choosingwisely.org/patient-resources/antibiotics/)

## LIFESTYLE ADVICE

- Inquire and ensure that patients' vaccinations are up to date.
- Encourage patients to practise good hand hygiene to minimize the spread of infections.
- Encourage patients to avoid going to work when they are sick, to minimize the spread of infections.
- Encourage patients to understand the limitations and risks of antibiotics and the situations when these drugs are actually needed.
- Discourage patients from saving antibiotics prescribed for one illness for future use or self-medication, unless they have instructions to do so from their healthcare providers.

## WEBSITES/RESOURCES

- Antimicrobial Stewardship Program, Sinai Health System and University Health Network (Toronto): [www.antimicrobialstewardship.com](http://www.antimicrobialstewardship.com)
- Antibiotic prescribing and use in hospitals and long-term care (from the US Centers for Disease Control and Prevention): [www.cdc.gov/getsmart/healthcare/index.html](http://www.cdc.gov/getsmart/healthcare/index.html)
- Association of Medical Microbiology and Infectious Disease Canada: [www.ammi.ca](http://www.ammi.ca) (see Antimicrobial Stewardship tab, and pages on Asymptomatic Bacteriuria and Business Case)
- Antimicrobial stewardship in daily practice: managing an important resource (position statement of the Canadian Paediatric Society): [www.cps.ca/documents/position/antimicrobial-stewardship](http://www.cps.ca/documents/position/antimicrobial-stewardship)
- Infectious Disease: Five Things Physicians and Patients Should Question (from Choosing Wisely Canada): [www.choosingwiselycanada.org/infectious-disease/](http://www.choosingwiselycanada.org/infectious-disease/)
- National Collaborating Centre for Infectious Diseases, University of Manitoba: [www.nccid.ca/antibiotic-awareness](http://www.nccid.ca/antibiotic-awareness)
- Antimicrobial resistance & stewardship (from the UK Royal Pharmaceutical Society): [www.rpharms.com/making-a-difference/projects-and-campaigns/antimicrobial-resistance-stewardship](http://www.rpharms.com/making-a-difference/projects-and-campaigns/antimicrobial-resistance-stewardship)
- National Centre for Antimicrobial Stewardship, Australia: [www.ncas-australia.org](http://www.ncas-australia.org)
- Antimicrobial Stewardship Project, Center for Infectious Disease Research and Policy, University of Minnesota: [www.cidrap.umn.edu/asp](http://www.cidrap.umn.edu/asp)
- Public Health Ontario's Antimicrobial Stewardship: [www.publichealthontario.ca/asp](http://www.publichealthontario.ca/asp)

## LEARN MORE

- Barlam TF, Cosgrove SE, Abbo LM, et al. Implementing an antibiotic stewardship program: guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. *Clin Infect Dis*. 2016;62(10):e51-77.
- Hyun DY, Hersh AL, Namtu K, et al. Antimicrobial stewardship in pediatrics: how every pediatrician can be a steward. *JAMA Pediatr*. 2013;167(9):859-66.
- Tackling antimicrobial resistance and antimicrobial use: a pan-Canadian framework for action. Ottawa (ON): Public Health Agency of Canada; 2017 [modified 2017 Sep 12; cited 2017 Oct 2]. Available from: <https://www.canada.ca/en/health-canada/services/publications/drugs-health-products/tackling-antimicrobial-resistance-use-pan-canadian-framework-action.html>
- Society for Healthcare Epidemiology of America, Infectious Diseases Society of America, Pediatric Infectious Diseases Society. Policy statement on antimicrobial stewardship by the Society for Healthcare Epidemiology of America (SHEA), the Infectious Diseases Society of America (IDSA), and the Pediatric Infectious Diseases Society (PIDS). *Infect Control Hosp Epidemiol*. 2012;33(4):322-7.

Acknowledgements: Miranda So for substantial contribution to this publication  
Royal Pharmaceutical Society for its permission to adapt its Medicines Optimisation Briefing template

Published November 2017