

MD Snapshot-Prescribing Educational Resource

1. What are the short and long-term risks and implications of antimicrobial use (AMU) and antimicrobial-resistant organisms (AROs)?

- Adverse effects and outcomes of antibiotics range from less to very serious and include: digestive effects, fungal/yeast infections, drug interactions, photosensitivity to allergic reactions, Stevens Johnson syndrome, QT interval prolongation, C. difficile infections and tendonitis.
- C. difficile infections and related expenses cost the healthcare system more than \$280 million per year (2021 data for Canada).^{kk}
- Increased emergency department visits: at least 16% are due to AMU-related adverse drug reactions, e.g., severe skin reactions, QT interval prolongation, etc.^k
- AROs lead to prolonged symptom duration, increased treatment failure rates, increased deaths and longer hospitalization stays.^{a,b,c}
- Imbalance in gut biome, which can lead to metabolic, immunologic and developmental disorders, e.g., asthma, epilepsy, obesity, type 2 diabetes and colorectal adenoma.
- Antimicrobial resistance (AMR) has a social impact: decreased recreation and travel, quality of life and trust in the healthcare system, as well as increased isolation and discrimination.^d
- AMR costs the Canadian healthcare system at least \$1.4 billion annually, not including costs of lost productivity and income (based on 2018 data).^d
- Inadequate voluntary actions may result in the implementation of more powerful regulatory, fiscal and legislative policies that may be concerning to some.⁹

2. What does the data say about the extent and appropriateness of antibiotic prescribing?

- According to the most recent Tracked Prescription Program report, [TPP Alberta Antibiotic Prescription Atlas 2020](#), approximately 2 million antibiotic prescriptions were dispensed to 1.1 million unique patients in the previous year.
- Prescriptions were written by more than 17,000 prescribers for a rate of 431 prescriptions/1,000 population. Seventy-eight percent (78%) of oral antibiotics were prescribed by physicians.^h
- Over 90% of all human antimicrobial consumption occurs in the outpatient setting.ⁱ
- At least 26% of infections are resistant to the drugs used to treat them.^j
- Over 15% of infectious disease encounters in a Canadian primary care setting resulted in an unnecessary antibiotic prescription. Almost one-quarter of all antibiotic prescriptions were written for conditions where they are never or rarely indicated.^k
- Inappropriate antibiotic prescribing remains common in Canada – estimated at up to 50% of prescriptions for respiratory infections.^l
- While evidence-based strategies to improve antimicrobial use have been identified in hospital settings, few have been implemented in primary care.

3. What are the drivers of inappropriate AMU?

The largest modifiable driver of resistance is antibiotic use.^k

Some factors that drive antimicrobial misuse in primary care are:^{1,m,k}

- The lack of a long-term clinical relationship between the patient and their healthcare provider.
- Miscommunications and misunderstandings.
- Inadequate access to specialized skills and knowledge (e.g., infectious disease-trained physician or pharmacist, microbiologist).
- Limited availability of evidence-based treatment guidelines, based on current and local resistance patterns.
- Disjointed computer systems, which hinder sharing of patient-level information (e.g., allergy history, recent antimicrobial use, and laboratory and microbiology data) and population-level data (e.g., prescribing trends, up-to-date resistance patterns).
- Fewer opportunities for targeted (i.e., narrow) antimicrobial therapy, as microbiological sampling in many community-based infections is either impractical or less likely to produce meaningful results.
- A lack of cost-effective, rapid, point-of-care diagnostic tools to help healthcare professionals differentiate between viral, bacterial, and non-infectious causes of symptoms for use when thorough history-taking, physical examination and clinical assessment are inconclusive.
- Limited ability to closely follow patients given busy practices, resulting in unnecessary prescribing and longer than recommended treatment courses.
- Lack of impetus to challenge ill-defined beta-lactam allergies, resulting in increased use of broad-spectrum alternatives.
- Pressure to prescribe an antimicrobial due to real or perceived patient expectation, lack of patient knowledge about appropriate AMU, parental anxiety, need to return to work, or clinician's desire to "do something".
- Limited time for management of patient expectations and complete discussion of likely risks and benefits of therapy.
- Increased risk for inadvertent or intentional patient self-administration of therapy.

4. What actions can prescribers take to help address AMR?

- A commitment to following appropriate prescribing guidelines, e.g., posting commitment indicators in waiting and examination rooms to help manage patient expectations.
- Completing in-depth patient histories, physical examinations and clinical assessments.
- Using narrow-spectrum antibiotics instead of broad-spectrum to cause the least amount of collateral damage.
- Using oral instead of injectable antibiotics whenever possible.

- Prescribing the shortest duration of therapy.
- Practicing and encouraging infection prevention.
- Not avoiding beta-lactams without a thorough allergy assessment.¹
- Clinical decision support, either computerized or paper-based, to provide non-antimicrobial recommendations when appropriate, with or without a requirement to justify antimicrobial prescription.^{1,t}
- Communication skills training to improve the effectiveness and clarity of dialogue between patients and healthcare professionals.^{1,v}
- Educational campaigns, both for healthcare professionals and general public awareness, when used in combination with other strategies.^{1,w,x}
- If appropriate, delayed prescribing or watchful waiting strategies for certain infections (in limited circumstances).^{1,o,p,q,r,ij}

Sorry, but no amount of antibiotic will get rid of your cold.^y

5. What are some clinical guidelines and references to help guide AMU?

Examples include:

[Accelerating Change Transformation Team](#) (Alberta Medical Association)

[Guideline Central: Infectious Diseases](#)

[Bugs & Drugs](#)

[Infection Prevention and Control](#) (Alberta Health Services)

[Canadian Guidelines on Sexually Transmitted Infections](#) (Health Canada)

[TPP Alberta Antibiotic Prescription Atlas 2020](#)

[NB Antimicrobial Treatment Guidelines for Common Infections](#)

[Choosing Wisely Canada](#)

[Antimicrobials – Handle with Care](#)

[When Antibiotics Fail](#) (poster)

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