

Pharmacist Clinical Tool for Identifying Antimicrobial Therapy Problems

Categories of Common Antimicrobial Drug Therapy Problems

with examples that are by no means an exhaustive list

Therapeutic duplication or drug may not be necessary

- Discontinue antibiotic if prescribed antibiotics have the same coverage.
e.g. Received a new prescription for oral vancomycin for Clostridium difficile infection; discontinue current metronidazole treatment, if appropriate.¹
- Discontinue antibiotic if diagnostic results indicate a viral infection.
e.g. Discontinue antibiotic if chest radiograph indicates viral pneumonia.²

Requires drug; patient needs additional drug therapy

- Add drug therapy if no drug was prescribed for an indication.
e.g. Add prescription analgesic if patient presents with pain while being on an antibiotic treatment for wound infection due to sub-optimal response with OTC pain reliever.

Sub-optimal response to a drug; drug is not working as well as needed

- Change antibiotic if culture and susceptibility report indicates bacterial infection that is not covered by empiric therapy.
e.g. Discontinue penicillin and start azithromycin for community-acquired pneumonia with culture results indicating mycoplasma pneumoniae infection that is susceptible to this antibiotic.³

Dosage is too low

- Increase antibiotic dose if it is incorrect based on patient's weight.
e.g. Child is 15 kg, prescribed amoxicillin 150 mg TID for acute otitis media; recommended dose is 40-50 mg/kg/day divided every 8 hours; give 250 mg TID.⁴

Adverse drug reaction; possibly due to allergy, interaction, side effect

- Change antibiotic if cross-allergenicity between antibiotics is a concern.
e.g. Discontinue cephalexin and start clindamycin for non-purulent cellulitis if patient presents with severe beta-lactam allergy.⁵

Dangerously high dose or accidental or purposeful overdosing

- Decrease antibiotic dose according to renal function.
e.g. Patient creatinine clearance is 20 mL/min, prescribed sulfamethoxazole-trimethoprim for acute urinary tract infection; recommended dose is half of normal dose.⁶
- Decrease length of treatment if prescribed duration of therapy is longer than the standard dosing regimen for the indication.
e.g. Patient prescribed nitrofurantoin x 7 days for cystitis, recommended duration of therapy is 5 days.⁷

Non-compliance; patient is refusing to take drug or taking it improperly

- Consider patient convenience.
e.g. Discontinue amoxicillin TID x 10 days and start azithromycin daily x 5 days for group A streptococcal pharyngitis if patient expresses difficulty with compliance.⁸

Helpful Resources

Healthcare Provider-Facing Resources

- [Association of Medical Microbiology and Infectious Disease Canada](#)
- [Canadian Pediatric Society](#)
- [Canadian Pharmacists Association](#)
- [Canadian Society of Hospital Pharmacists](#)
- [Do Bugs Need Drugs?](#)
- [Life Labs](#)
- [Public Health Ontario](#)

Patient-Facing Resources

- [Choosing Wisely Canada](#)
- [Ontario Pharmacists Association](#)
- [World Health Organization](#)

Common Myths about Antibiotics that Patients may Believe

Antibiotics can cure my cold or flu.

Antibiotics treat bacterial infections, while antivirals treat viral infections.⁹ To effectively treat viral infections, such as the common cold or influenza, keep yourself hydrated and get plenty of rest.⁹ Consider getting vaccinated against viral and/or bacterial infections to prevent the overuse and misuse of antibiotics which drive resistance.¹⁰

I cannot take penicillin because I am allergic to it.

Before reporting a penicillin allergy, have you taken an allergy test? Penicillin allergy is often over-reported, thereby limiting the use of beta lactams and resulting in sub-optimal therapeutic responses and adverse events. Before reporting a penicillin allergy, consider whether the reaction is a true allergy or a side effect, as well as its severity.¹¹

I can stop taking my antibiotic prescription as soon as I feel better.

If you have been prescribed an antibiotic, the medication and duration of therapy selected by your prescriber should be based on best clinical evidence. It is recommended that you complete your course of antibiotics – feeling better may not always mean the bacterial infection has been completely cleared.¹²

References

1. Kelly CP, Lamont JT, Bakken JS. Clostridium difficile infection in adults: treatment and prevention. In: UpToDate. Alphen aan den Rijn, The Netherlands: Wolters Kluwer. [Updated March 2018; Accessed April 2, 2018]. <https://www.uptodate.com/contents/search>
2. Bartlett JG. Diagnostic approach to community-acquired pneumonia in adults. In: UpToDate. Alphen aan den Rijn, The Netherlands: Wolters Kluwer. [Updated December 2017; Accessed April 2, 2018]. <https://www.uptodate.com/contents/search>
3. Loeb M. Community-acquired pneumonia. In: Compendium of Therapeutics for Choices. Ottawa, ON: Canadian Pharmacists Association. [Updated May 2017; Accessed April 2, 2018]. <https://myrxtx.ca>
4. Vayalunkal JV. Acute otitis media in childhood. In: Compendium of Therapeutics for Choices. Ottawa, ON: Canadian Pharmacists Association. [Updated August 2017; Accessed April 2, 2018]. <https://myrxtx.ca>
5. Spelman D, Baddour LM. Cellulitis and skin abscess in adults: treatment. In: UpToDate. Alphen aan den Rijn, The Netherlands: Wolters Kluwer. [Updated February 2018; Accessed April 2, 2018]. <https://www.uptodate.com/contents/search>
6. Sulfamethoxazole-Trimethoprim (CPhA Monograph). In: Compendium of Pharmaceuticals and Specialties. Ottawa, ON: Canadian Pharmacists Association. [Updated October 2013; Accessed April 2, 2018]. <https://myrxtx.ca>
7. Nicolle L. Urinary Tract Infection. In: Compendium of Therapeutics for Choices. Ottawa, ON: Canadian Pharmacists Association. [Updated September 2017; Accessed April 2, 2018]. <https://myrxtx.ca>
8. Steer AC. Streptococcal sore throat. In: Compendium of Therapeutics for Choices. Ottawa, ON: Canadian Pharmacists Association. [Updated June 2017; Accessed April 2, 2018]. <https://myrxtx.ca>
9. Colds, Flu, and Other Respiratory Illnesses: Don't Rush to Antibiotics. Choosing Wisely Canada. [cited 2018 March 29]. Available from: <https://choosingwiselycanada.org/colds-flu-respiratory-illnesses-dont-rush-antibiotics/>
10. Why is vaccination important for addressing antibiotic resistance? World Health Organization. [cited 2018 March 29]. Available from: <http://www.who.int/features/qa/vaccination-antibiotic-resistance/en/>
11. Resources. Public Health Ontario. [cited 2018 March 29]. Available from: <https://www.publichealthontario.ca/en/BrowseByTopic/InfectiousDiseases/AntimicrobialStewardshipProgram/Pages/Building%20a%20Stewardship%20Program.aspx>
12. Does stopping a course of antibiotics early lead to antibiotic resistance? World Health Organization. [cited 2018 March 29]. Available from: <http://www.who.int/features/qa/stopping-antibiotic-treatment/en/>