Antimicrobial Stewardship Strategy:
Empiric antibiotic prescribing guidelines

Multidisciplinary, evidence-based recommendations using local susceptibility data to standardize and improve the selection of initial therapy for common infectious diseases.

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This is a PHO CORE strategy

Priority Level: **A**

Difficulty Level: **2**

Program Stage:

- ✓ Early
- Intermediate
- Advanced

Antimicrobial Stewardship Outcomes:

- Prescribing outcomes

For more information on these criteria and how they were developed, please see the Antimicrobial Stewardship Strategy Criteria Reference Guide.

Updated June 2016

Description

This is an overview and not intended to be an all-inclusive summary. As a general principle, patients must be monitored by the health care team after changes to therapy resulting from recommendations made by the antimicrobial stewardship team.

An important function of antimicrobial stewardship programs is the development of multidisciplinary evidence-based guidelines that incorporate local information. Empiric antibiotic prescribing guidelines lead to quality, standardized care for common infectious diseases by helping prescribers select an initial therapy for a variety of infections.

Empiric treatment guidelines typically provide both first-line and alternative (e.g., in case of severe penicillin allergy) antibiotic recommendations for common infections such as community-acquired pneumonia, hospital-acquired pneumonia, intra-abdominal infections, urogenital tract infections, meningitis, skin and soft tissue infections etc.

Choice of therapy is based on:

- The site of infection.
- Common pathogens encountered.
- Local epidemiology and resistance patterns.
- Evidence and clinician consensus.
- Antimicrobial stewardship principles.
- Formulary availability.
- Antimicrobial costs.

Empiric prescribing guidelines are appropriate for most patients, but they do not replace clinical judgment.

Clinicians should always consider patient-specific information (e.g., prior culture results, recent antimicrobial therapy and immune status) when selecting therapy. They should also reassess their initial treatment choice (continue, modify, de-escalate, discontinue) once cultures are available.

An efficient way to develop local empiric antibiotic regimens is to use established national or provincial guidelines, and/or guidelines from other institutions. It is important to ensure other guidelines are adapted for the institution. Local guidelines should also be updated regularly as new information becomes available.

Consider strategies to facilitate the implementation and adoption of empiric guidelines and overcome potential barriers:

- Stakeholder involvement in the development of the guidelines will improve the uptake of the recommendations.
- Education of prescribers can be done during formal rounds and in informal settings.
- Distribution of the guidelines via a pocket card and/or hospital intranet sites or computerized physician order entry can facilitate compliance.

Advantages

- Improves adherence with standards of care (for some infections, guideline-adherent therapy has been shown to improve patient outcomes).
- Can adapt national/regional guidelines to local practice and antibiogram.
- Multidisciplinary in development.

Disadvantages

- Labour-intensive to develop and periodically review.
- Implementation may be difficult because of resistance from prescribers and unfamiliarity with guidelines.
- Needs buy-in from a majority of stakeholders to be effective.

Requirements

- Personnel with expertise to develop guidelines.
- Strategy to disseminate guidelines (e.g., posters in the emergency department, pocket cards, links to electronic resources).

Associated Metrics

- Proportion of patients on guideline-concordant antibiotic therapy for a given indication.

Useful References

Select articles to provide supplemental information and insight into the strategy described and/or examples of how the strategy was applied; not a comprehensive reference list. URLs are provided when materials are freely available on the Internet.

- Centers for Disease Control and Prevention. Core elements of hospital antibiotic stewardship programs [Internet]. Atlanta, GA: Centers for Disease Control and Prevention; 2015 May 7 [cited 2015 Sep 21]. Available from: http://www.cdc.gov/getsmart/healthcare/implementation/core-elements.html

Tools and Resources (updated June 2016)

- Mount Sinai Hospital and University Health Network Antimicrobial Stewardship Program. Antimicrobial stewardship clinical summaries [Internet]. Toronto, ON: Mount Sinai Hospital, University Hospital Network; c2015 [cited 2015 Sep 24]. Available from: http://www.antimicrobialstewardship.com/sites/default/files/mshuhn_antimicrobial_stewardship_clinical_summaries.pdf
- Antimicrobial stewardship programme treatment guidelines for common infections. Vancouver, BC: Vancouver Coastal Health, ASPIRES; 2014 Jan [cited 2015 Oct 13]. Available from: http://vhpharmsci.com/PagePocket/index.html

Example of treatment guidelines for common infections.

Samples/Examples (updated June 2016)

- Example 1: The Ottawa Hospital - Guidelines for Empiric Antibiotic Therapy 2016
- Example 2: Lignes Directrices de l'Hôpital Montfort pour le Traitement Antibiotique Empiric

These documents have been generously shared by various health care institutions to help others develop and build their antimicrobial stewardship programs. We recommend crediting an institution when adopting a specific tool/form/pathway in its original form.

Examples that contain clinical or therapeutic recommendations may not necessarily be consistent with published guidelines, or be appropriate or directly applicable to other institutions. All examples should be considered in the context of the institution's population, setting and local antibiogram.

The materials and information in this section are not owned by Public Health Ontario. Neither Public Health Ontario nor the institution sharing the document shall be responsible for the use of any tools and resources by a third party.

Links with Other Strategies

- Antibiograms
- Disease-specific treatment guidelines, pathways, algorithms and/or associated order forms
- General antimicrobial order forms
- Prescriber education
- Prospective audit with intervention and feedback

Disclaimer

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Antimicrobial Stewardship Strategy: Empiric antibiotic prescribing guidelines. Toronto, ON: Queen's Printer for Ontario; 2016.

For further information

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Example 1: The Ottawa Hospital - Guidelines for Empiric Antibiotic Therapy 2016

TOH GUIDELINES FOR EMPIRIC ANTIBIOTIC THERAPY

Developed by the Antimicrobial Subcommittee of the Pharmacy & Therapeutics Committee

PHY 221 (03/2016)

Example 1: The Ottawa Hospital - Guidelines for Empiric Antibiotic Therapy 2016 (continued)

BONE AND JOINT INFECTIONS		
	First Line	**Alternate Choice***
Osteomyelitis *NB: Start antibiotics after bone biospy or cultures obtained*		
Diabetes or vascular insufficiency†	Ceftriaxone 2 g IV q24h AND Metronidazole 500 mg PO/IV q8-12h	Vancomycin 1 g IV q12h‡ AND Ciprofloxacin 750 mg PO q12h or 400 mg IV q12h AND Metronidazole 500 mg PO/IV q8-12h
IVDU or MRSA risk factors§	Vancomycin 1 g IV q12h‡ +/- Ciprofloxacin 750 mg PO q12h; OR 400 mg IV q12h	
All other patients	Cefazolin 2 g IV q8h; OR Cloxacillin 2 g IV q4h	Vancomycin 1 g IV q12h‡
Prosthetic joint infection *NB: Start antibiotics after cultures obtained*	Vancomycin 1 g IV q12h‡	
Septic arthritis/septic bursitis		
If gonococcus suspected	Ceftriaxone 1-2 g IV q24h	
All other patients	Cefazolin 2 g IV q8h; OR Cloxacillin 2 g IV q4h	Vancomycin 1 g IV q12h‡
*Alternate choice may be required for patients with allergies, recent antibiotic therapy or risk factors for specific microorganisms. †See TOH clinical pathway under resources/infectious diseases of vOACIS or clinmobile. ‡Vancomycin dose for a 70 kg patient with a normal renal function (recommended dosage: 15-20 mg/kg/dose). §MRSA risk factors: colonization with MRSA, injection drug user, history of substance abuse, homeless in the last year, from crowded living conditions (e.g., correctional facility).		
Note: Recommended doses assume normal renal function. All antibiotics listed in the tables require adjustment in patients with renal dysfunction except for the following: Azithromycin, Ceftriaxone, Cloxacillin, and Metronidazole.		
Ref: Osteomyelitis: Sia IG et al. Best Pract Res Clin Rheumatol 2006;20(6):1065-81; Lew DP et al. Lancet 2004; 364:369-79; Septic arthritis: Coakley G et al. Rheumatology 2006;45:1039–41; Sharff et al. Curr Rheumatol Rep 2013;15(6):332; Prosthetic joint infection: Osmon DR et al. CID 2013;56(1):e1-25.		
CENTRAL NERVOUS SYSTEM INFECTIONS		
	First Line	**Alternate Choice***
Brain abscess		
Post neurosurgery	Ceftazidime 2 g IV q8h AND Metronidazole 500 mg IV/PO q8h AND Vancomycin 1.5 g IV q12h†	
All other patients	Ceftriaxone 2 g IV q12h AND Metronidazole 500 mg IV/PO q8h	

Example 1: The Ottawa Hospital - Guidelines for Empiric Antibiotic Therapy 2016 (continued)

Meningitis		
18-50 y.o.	*Consider steroids at first dose of antibiotics* Ceftriaxone 2 g IV q12h AND Vancomycin 1.5 g IV q12h†	Chloramphenicol 1 g IV q6h AND Vancomycin 1.5 g IV q12h†
More than 50 y.o. or alcoholism or immunocompromised	*Consider steroids at first dose of antibiotics* Ceftriaxone 2 g IV q12h AND Vancomycin 1.5 g IV q12h† AND Ampicillin 2 g IV q4h (for Listeria)	Chloramphenicol 1 g IV q6h AND Vancomycin 1.5 g IV q12h† AND Trimethoprim(TMP)-sulfamethoxazole 5 mg TMP/kg IV q6h
Post trauma or neurosurgery or shunt	Ceftazidime 2 g IV q8h AND Vancomycin 1.5 g IV q12h†	
*Alternate choice may be required for patients with allergies, recent antibiotic therapy or risk factors for specific microorganisms. †Vancomycin dose for a 70 kg patient with a normal renal function (recommended dosage 30-45 mg/kg/day in 2-3 doses).		
Note: Recommended doses assume normal renal function. All antibiotics listed in the tables require adjustment in patients with renal dysfunction except for the following: Azithromycin, Ceftriaxone, Cloxacillin, and Metronidazole.		
Ref: Meningitis: Tunkel AR et al. CID 2004;39:1267-84; van de Beek et al. N Engl J Med 2010; 362:146-54; Shin et al. Expert Opin Pharmacother 2012;13(15):2189-2206; Brain abscess: Brouwer et al. N Engl J Med 2014;371:447-56; Hakan T. Neurosurg Focus 2008;24(6)E4:1-7.		

ENDOCARDITIS

	First Line	Alternate Choice*
Endocarditis *NB: ideally obtain 3 sets of blood cultures obtained from different venipuncture sites with the first and last samples drawn at least 1 hour apart, before starting antibiotics*		
Native valve	Vancomycin 1 g IV q12h† AND Ceftriaxone 2 g IV q24h	Vancomycin 1 g IV q12h† AND Gentamicin 3 mg/kg IV q24h
Prosthetic valve	Vancomycin 1 g IV q12h† AND Ceftriaxone 2 g IV q24h AND Gentamicin 3 mg/kg IV q24h	Vancomycin 1 g IV q12h† AND Ciprofloxacin 500-750 mg PO q12h OR 400 mg IV q12h
IVDU	Vancomycin 1 g IV q12h† +/- Tobramycin 7 mg/kg/day IV q24h	Vancomycin 1 g IV q12h† +/- Ceftazidime 2 g IV q8h
*Alternate choice may be required for patients with allergies, recent antibiotic therapy or risk factors for specific microorganisms. †Vancomycin dose for a 70 kg patient with a normal renal function (recommended dosage: 15-20 mg/kg/dose).		
Note: Recommended doses assume normal renal function. All antibiotics listed in the tables require adjustment in patients with renal dysfunction except for the following: Azithromycin, Ceftriaxone, Cloxacillin, and Metronidazole.		
Ref: Baddour LM et al. Circulation 2015;132(15):1435-86; Habib G et al. Eur Heart J 2015;36(44):3075-128; Additional references for once daily gentamicin: Dahl A et al. Circulation 2013;127(17):1810-7; Buchholtz K et al. Cardiology 2011;119(2):65-71.		

FEBRILE NEUTROPENIA

	First Line	Alternate Choice*
Febrile neutropenia	Piperacillin-tazobactam 3.375 g IV q6h +/- Vancomycin 1 g IV q12h†	Levofloxacin 750 mg IV q24h +/- Vancomycin 1 g IV q12h†
*Alternate choice may be required for patients with allergies, recent antibiotic therapy or risk factors for specific microorganisms. †Vancomycin dose for a 70 kg patient with a normal renal function (recommended dosage: 15-20 mg/kg/dose).		

Example 1: The Ottawa Hospital - Guidelines for Empiric Antibiotic Therapy 2016 (continued)

Note: Recommended doses assume normal renal function. All antibiotics listed in the tables require adjustment in patients with renal dysfunction except for the following: Azithromycin, Ceftriaxone, Cloxacillin, and Metronidazole.

Ref: Freifeld AG et al. CID 2011;52(4) :e56-e93.

GENITOURINARY INFECTIONS

	First Line	Alternate Choice*
Pelvic abscess		
If related to pelvic inflammatory disease	Refer to recommendations for pelvic inflammatory disease	
If secondary to bowel/GI source	Refer to recommendations for intra-abdominal abscess	
Pelvic inflammatory disease (PID)/ endometritis	Clindamycin 900 mg IV q8h AND Gentamicin 5 mg/kg q24h (stepdown to oral Doxycycline or oral Clindamycin)	Ceftriaxone 1 g IV q24h AND Metronidazole 500 mg PO/IV q12h AND Doxycycline 100 mg PO q12h (Doxycycline may be omitted for endometritis unless concern for chlamydia); OR Levofloxacin 500 mg IV q24h AND Metronidazole 500 mg PO/IV q12h *NB: quinolones should not be used for infections involving N. gonorrhoeae*
Pyelonephritis/urosepsis		
All other patients	Ceftriaxone 1 g IV q24h +/- Ampicillin 1 g IV q6h	Gentamicin 3-5 mg/kg IV q24h +/- Ampicillin 1 g IV q6h
Pseudomonas risk factors†	Ceftazidime 1-2 g IV q8h +/- Ampicillin 1 g IV q6h	Tobramycin 3-5 mg/kg q24h OR Ciprofloxacin 400 mg IV q12h, +/- Ampicillin 1 g IV q6h

*Alternate choice may be required for patients with allergies, recent antibiotic therapy or risk factors for specific microorganisms.

†Common *Pseudomonas aeruginosa* risk factors: colonized with *Pseudomonas aeruginosa* or has at least 2 of the following: recent hospitalization, frequent (>4 per year) or recent course of antibiotics (last 3 months), severe disease, or prolonged high dose steroid use.

Note: Recommended doses assume normal renal function. All antibiotics listed in the tables require adjustment in patients with renal dysfunction except for the following: Azithromycin, Ceftriaxone, Cloxacillin, and Metronidazole.

Example 1: The Ottawa Hospital - Guidelines for Empiric Antibiotic Therapy 2016 (continued)

Ref: Genitourinary infections: Gupta K et al. CID 2011;52(5):e103-20; Grabe M et al. Guidelines on urological infections. European Association of Urology 2014; Nicolle LE. Crit Care Clin 2013;29:699-715; Pelvic Inflammatory Disease: Public Health Agency of Canada. Canadian guidelines on sexually transmitted infections. Last updated 2013. Available from: http://www.phac-aspc.gc.ca/std-mts/sti-its/cgsti-ldcits/section-4-4-eng.php; Workowski KA et al. MMWR Recomm Rep. 2015 5;64(RR-03):1-137.

INTRA-ABDOMINAL INFECTIONS

	First Line	Alternate Choice*
Appendicitis	Ceftriaxone 1 g IV q24h AND Metronidazole 500 mg PO/IV q12h	Gentamicin 5 mg/kg IV q24h AND Metronidazole PO/IV 500 mg q12h; OR Ciprofloxacin 500-750 mg PO q12h or 400 mg IV q12h AND Metronidazole 500 mg PO/IV q12h
Cholangitis/biliary sepsis		
If severe	Piperacillin-tazobactam 3.375 g IV q6h	Ciprofloxacin 500-750 mg PO q12h or 400 mg IV q12h AND Metronidazole 500 mg PO/IV q12h AND Ampicillin 1 g IV q6h
All other patients	Ceftriaxone 1 g IV q24h AND Metronidazole 500 mg PO/IV q12h	Ciprofloxacin 500-750 mg PO q12h or 400 mg IV q12h AND Metronidazole 500 mg PO/IV q12h
Cholecystitis		
If severe	Ceftriaxone 1g IV q24h AND Ampicillin 1 g IV q6h	Ciprofloxacin 500-750 mg PO q12h or 400 mg IV q12h AND Vancomycin 1 g IV q12h†
If biliary-enteric anastomosis	Ceftriaxone 1 g IV q24h AND Metronidazole 500 mg PO/IV q12h	Ciprofloxacin 500-750 mg PO q12h or 400 mg IV q12h AND Metronidazole 500 mg PO/IV q12h
All other patients	Ceftriaxone 1g IV q24h	Ciprofloxacin 500-750 mg PO q12h or 400 mg IV q12h
Diverticulitis	Ceftriaxone 1 g IV q24h AND Metronidazole 500 mg PO/IV q12h	Ciprofloxacin 500-750 mg PO q12h or 400 mg IV q12h AND Metronidazole 500 mg PO/IV q12h; OR Amoxicillin-clavulanic acid 875 mg PO q12h or 500 mg PO q8h
Intra-abdominal abscess	Ceftriaxone 1 g IV q24h AND Metronidazole 500 mg PO/IV q12h	Piperacillin-tazobactam 3.375 g IV q6h; OR Ciprofloxacin 500-750 mg PO q12h or 400 mg IV q12h AND Metronidazole 500 mg PO/IV q12h
Peritonitis		
Spontaneous bacterial peritonitis/ primary	Ceftriaxone 2 g IV q24h	Levofloxacin 750 mg IV q24h (unless on quinolone prophylaxis)
Acute perforation/secondary, community-acquired	Ceftriaxone 1 g IV q24h AND Metronidazole 500 mg PO/IV q12h	Gentamicin 5 mg/kg IV q24h AND Metronidazole PO/IV 500 mg q12h; OR Ciprofloxacin 500-750 mg PO q12h or 400 mg IV q12h AND Metronidazole 500 mg PO/IV q12h

Example 1: The Ottawa Hospital - Guidelines for Empiric Antibiotic Therapy 2016 (continued)

Acute perforation/secondary, hospital-acquired or Persistent/recurrent/tertiary	Piperacillin-tazobactam 3.375 g IV q6h	Ciprofloxacin 500-750 mg PO q12h OR 400 mg IV q12h AND Metronidazole 500 mg PO/IV q12h
*Alternate choice may be required for patients with allergies, recent antibiotic therapy or risk factors for specific microorganisms. †Vancomycin dose for a 70 kg patient with a normal renal function (recommended dosage: 15-20 mg/kg/dose).		
Note: Recommended doses assume normal renal function. All antibiotics listed in the tables require adjustment in patients with renal dysfunction except for the following: Azithromycin, Ceftriaxone, Cloxacillin, and Metronidazole.		
Ref: Solomkin JS et al. CID 2010;50:133-64; Doyle J et al. TASC: Toronto Antimicrobial Stewardship Corridor. Best Practice in General Surgery Guideline #4: Management of Intra-Abdominal Infections. April 2011. Available from: http://www.bpigs.ca/images/guidelines/IAI_Guideline_JUNE2012.pdf accessed 7-sept-2015.		
LINE INFECTION		
	First Line	**Alternate Choice***
Line infection	Vancomycin 1 g IV q12h† +/- Ceftazidime 1 g IV q8h	Vancomycin 1 g IV q12h† +/- Tobramycin 5 mg/kg q24h; OR Vancomycin 1 g IV q12h† +/- Ciprofloxacin 400 mg IV q12h
*Alternate choice may be required for patients with allergies, recent antibiotic therapy or risk factors for specific microorganisms. † Vancomycin dose for a 70 kg patient with a normal renal function (recommended dosage: 15-20 mg/kg/dose)		
Note: Recommended doses assume normal renal function. All antibiotics listed in the tables require adjustment in patients with renal dysfunction except for the following: Azithromycin, Ceftriaxone, Cloxacillin, and Metronidazole.		
Ref: Mermel LA et al. CID 2009;49:1-45.		
RESPIRATORY TRACT INFECTIONS		
	First Line	**Alternate Choice***
Aspiration pneumonia†		
Periodontal disease, putrid sputum, necrotizing pneumonia or lung abscess	Ceftriaxone 1 g IV q24h AND Metronidazole 500 mg PO/IV q12h	Levofloxacin 750 mg PO/IV q24h AND Metronidazole 500 mg PO/IV q12h
All other patients	Ceftriaxone 1 g IV q24h; OR Levofloxacin 750 mg PO/IV q24h	
Aspiration pneumonitis	No antibiotics	
Community-acquired pneumonia†		
Moderately ill	Ceftriaxone 1 g IV q24h +/- Azithromycin 500 mg PO/IV X1, then 250 mg PO/IV q24h; OR Levofloxacin 750 mg PO q24h	
Severely ill (e.g., ICU)	Ceftriaxone 1-2 g IV q24h AND Azithromycin 500 mg IV q24h	Levofloxacin 750 mg IV q24h; if ICU: Ceftriaxone 1-2 g IV 24h AND Levofloxacin 750 mg IV q24h
MRSA risk factors‡	Add Vancomycin 1 g IV q12h¶	
Hospital-acquired pneumonia†		
Multidrug resistant risk factors‡§	Ceftazidime 2 g IV q8h +/- Vancomycin 1 g IV q12h¶	Ciprofloxacin 750 mg PO q12h OR 400 mg IV q12h +/- Vancomycin 1 g IV q12h¶
All other patients	Ceftriaxone 1-2 g IV q24h	Levofloxacin 750 mg PO/IV q24h

Example 1: The Ottawa Hospital - Guidelines for Empiric Antibiotic Therapy 2016 (continued)

*Alternate choice may be required for patients with allergies, recent antibiotic therapy or risk factors for specific microorganisms.

†See TOH clinical pathway under under resources/infectious diseases of vOACIS or clinmobile.

‡Common MRSA risk factors: colonization with MRSA, injection drug user, history of substance abuse, homeless in the last year, from crowded living conditions (e.g., correctional facility).

§Common *Pseudomonas aeruginosa* risk factors: colonized with *Pseudomonas aeruginosa* or has at least 2 of the following: recent hospitalization, frequent (>4 per year) or recent course of antibiotics (last 3 months), severe disease, or prolonged high dose steroid use.

¶Vancomycin dose for a 70 kg patient with a normal renal function (recommended dosage: 15-20 mg/kg/dose).

Note: Recommended doses assume normal renal function. All antibiotics listed in the tables require adjustment in patients with renal dysfunction except for the following: Azithromycin, Ceftriaxone, Cloxacillin, and Metronidazole.

Ref: Community-acquired pneumonia: Mandell LA et al. CID 2007;44:S27–72; Mandell LA. Postgrad Med 2015;127(6):607-15; Postman DF et al. N Engl J Med 2015; 372(14):1312-23; Garin N et al. JAMA Int Med 2014;174(12):1894-1901;

Aspiration pneumonia: Marik PE. Curr Opin Pulm Med 2011;17:148-54; Raghavendran K et al. Crit Care Med 2011;39:818-26;

Hospital-acquired pneumonia: Rotstein C et al. Can J Infect Dis Med Microbiol 2008;19(1):19-53; American Thoracic Society. Am J Respir Crit Care Med 2005;171:388-416; Ottosen J et al. Surg Clin N Am 2014;94(6):1305-17; Woodhead M et al. Clin Microbiol Infect 2011;17(Suppl. 6):E1-59.

SEPSIS

	First Line	Alternate Choice*
Septic shock (known source)	Refer to appropriate section (for some infections, may consider a higher dose for first dose only).	
Septic shock (unknown source)	Piperacillin-tazobactam 3.375 g IV q6h +/- Tobramycin 5 mg/kg IV X 1 dose +/- Vancomycin 1 g IV q12h†	Vancomycin 1 g IV q12h† AND Ciprofloxacin 400 mg IV q12h AND Tobramycin 5 mg/kg X 1 dose

*Alternate choice may be required for patients with allergies, recent antibiotic therapy or risk factors for specific microorganisms.

†Vancomycin dose for a 70 kg patient with a normal renal function (recommended dosage: 15-20 mg/kg/dose)

Note: Recommended doses assume normal renal function. All antibiotics listed in the tables require adjustment in patients with renal dysfunction except for the following: Azithromycin, Ceftriaxone, Cloxacillin, and Metronidazole.

Ref: Dellinger RP et al. Crit Care Med 2008; 36:296; 2016 Sanford guide Antimicrobial therapy. Electronic version accessed Jan 13, 2016.

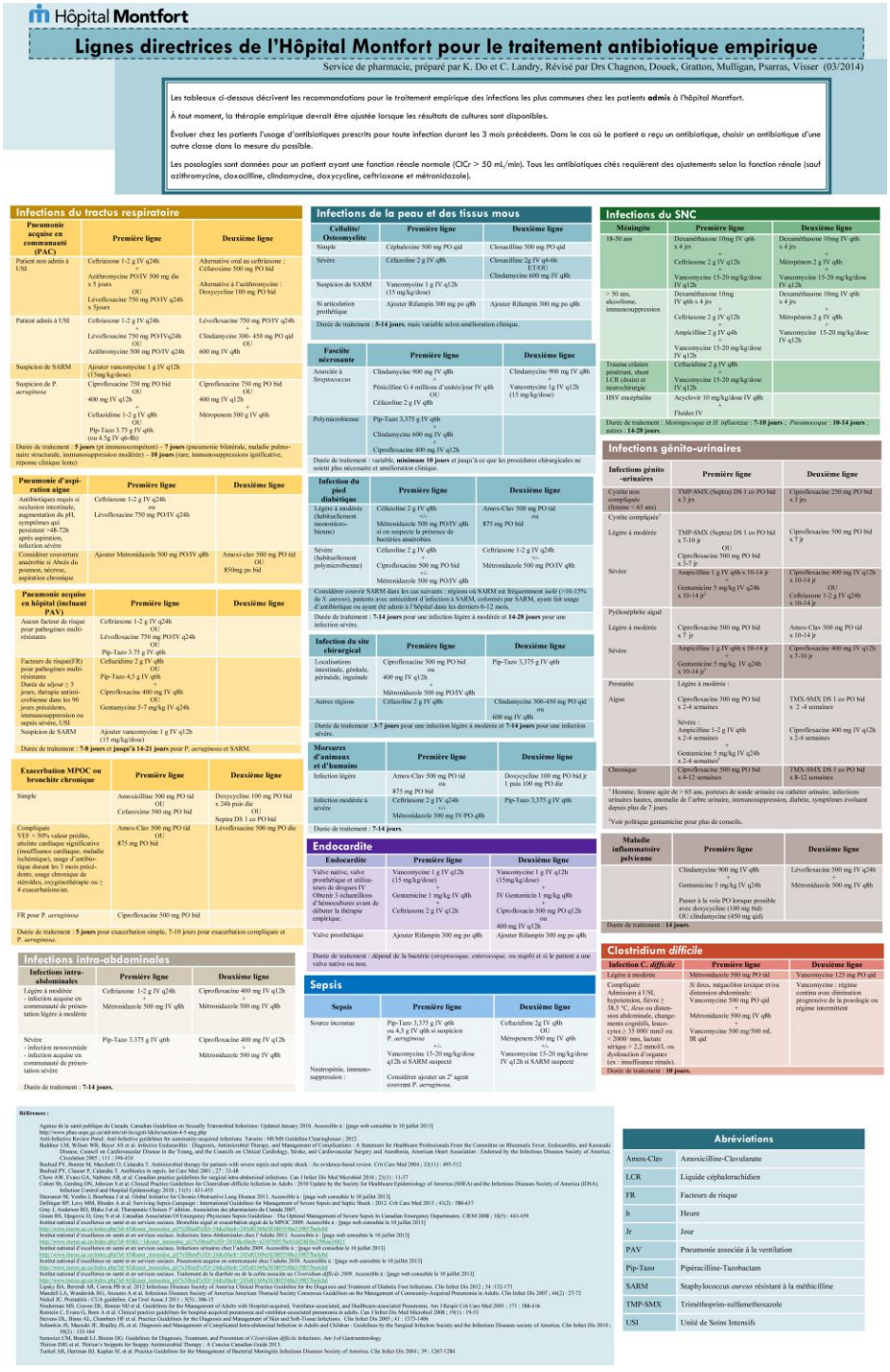
SKIN AND SOFT TISSUE INFECTIONS

	First Line	Alternate Choice*
Cellulitis or erysipelas		
Mild	Cephalexin 500 mg PO q6h	Clindamycin 300-450 mg PO q6h
Moderate	Cefazolin 1-2 g IV q8h	Vancomycin 1 g IV q12h†; OR Clindamycin 600-900 mg IV q8h
Severe	Vancomycin 1 g IV q12h†	
MRSA risk factors‡	Vancomycin 1 g IV q12h†	
Diabetic foot or vascular wound infection, or infected decubitus ulcer		
Mild, or Moderate acute (i.e., onset = days)	Cephalexin 500 mg-1 g PO q6h; OR Cefazolin 1-2 g IV q8h	Clindamycin 300-450 mg PO q6h or 600-900 mg IV q8h *(NB: 21% S. aureus resistant to Clindamycin)*

Example 1: The Ottawa Hospital - Guidelines for Empiric Antibiotic Therapy 2016 (continued)

Moderate chronic (i.e., onset = weeks to months)	PO options Amoxicillin-clavulanic acid 875 mg PO q12h or 500 mg PO q8h; OR Cefuroxime 500 mg PO q12h AND Metronidazole 500 mg PO q12h IV options Ceftriaxone 1-2 g IV q24h AND Metronidazole 500 mg IV q12h	Ciprofloxacin 500-750 mg PO q12h or 400 mg IV q12h AND Metronidazole 500 mg PO/IV q12h AND Vancomycin 1 g IV q12h†
Severe	Piperacillin-tazobactam 3.375 g IV q6h	Ciprofloxacin 500-750 mg PO q12h or 400 mg IV q12h AND Metronidazole 500 mg PO/IV q12h AND Vancomycin 1 g IV q12h†
Necrotizing fasciitis	Piperacillin-tazobactam 3.375 g IV q6h AND Clindamycin 600 mg IV q8h	Meropenem 500 mg IV q6h AND Clindamycin 600 mg IV q8h
Skin abscess		
Mild	Incision and drainage; no antibiotics	
Moderate	Incision and drainage; Cephalexin 500 mg -1 g PO q6h OR Cefazolin 1-2 g IV q8h	Trimethoprim-sulfamethoxazole 1 DS tab PO q12h OR Vancomycin 1 g IV q12h†
Moderate & MRSA risk factors‡	Vancomycin 1 g IV q12h†	
Severe	Vancomycin 1 g IV q12h†	
Surgical site infections		
Involving axilla, intestinal or genital tract, or perineum	Ceftriaxone 1 g IV q24h AND Metronidazole 500 mg PO/IV q12h	Piperacillin-tazobactam 3.375 g IV q6h
All other patients	Cefazolin 1-2 g IV q8h	
*Alternate choice may be required for patients with allergies, recent antibiotic therapy or risk factors for specific microorganisms. †Vancomycin dose for a 70 kg patient with a normal renal function (recommended dosage: 15-20 mg/kg/dose). ‡MRSA risk factors: colonization with MRSA, injection drug user, history of substance abuse, homeless in the last year, from crowded living conditions (e.g., correctional facility).		
Note: Recommended doses assume normal renal function. All antibiotics listed in the tables require adjustment in patients with renal dysfunction except for the following: Azithromycin, Ceftriaxone, Cloxacillin, and Metronidazole.		
Ref: Berbari et al. CID 2015:61(6):e26-e46; Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Can J Diabetes 2013;37:S145-9; Cunha BA. Antibiotics Essentials 2015; Hatzenbuehler J et al. Am Fam Physician 2011;84(9):1027-33; Lew DP et al. Lancet 2004:364:369-79; Lipsky BA et al. CID 2012:54(12):132-73; Spellberg B et al. CID 2012 ; 54(3):393-407; Stevens DL et al. CID 2014;59:147-59; Swartz N Engl J Med 2004; 350(9):904-12; Toronto Central Local Health Integration Network. Management of Uncomplicated Skin and Skin Structure Infections. 25-Jul-2014; Vayalumkal JV et al. CJEM 2012;14 (6):335-43		

Example 2: Lignes Directrices de l'Hôpital Montfort pour le Traitement Antibiotique Empiric



Hôpital Montfort

Lignes directrices de l'Hôpital Montfort pour le traitement antibiotique empirique

Service de pharmacie, préparé par K. Do et C. Landry, Révisé par Drs Chagnon, Douek, Gratton, Mulligan, Psarras, Visser (03/2014)

Les tableaux ci-dessous décrivent les recommandations pour le traitement empirique des infections les plus communes chez les patients **admis** à l'hôpital Montfort.

À tout moment, la thérapie empirique devrait être ajustée lorsque les résultats de cultures sont disponibles.

Éviter chez les patients l'usage d'antibiotiques prescrits pour toute infection durant les 3 mois précédents. Dans le cas où le patient a reçu un antibiotique, choisir un antibiotique d'une autre classe dans la mesure du possible.

Les posologies sont données pour un patient ayant une fonction rénale normale (ClCr > 50 mL/min). Tous les antibiotiques cités requièrent des ajustements selon la fonction rénale (sauf azithromycine, cloxacilline, clindamycine, doxycycline, ceftriaxone et métronidazole).

Infections du tractus respiratoire

Pneumonie acquise en communauté (PAC)	Première ligne	Deuxième ligne
Patient non admis à USI	Ceftriaxone 1-2 g IV q24h + Azithromycine PO/IV 500 mg die x 5 jours OU Lévofloxacine 750 mg PO/IV q24h x 5jours	Alternative oral au ceftriaxone : Céfuroxime 500 mg PO bid + Alternative à l'azithromycine : Doxycycline 100 mg PO bid
Patient admis à USI	Ceftriaxone 1-2 g IV q24h + Lévofloxacine 750 mg PO/IVq24h OU Azithromycine 500 mg PO/IV q24h	Lévofloxacine 750 mg PO/IV q24h + Clindamycine 300- 450 mg PO qid OU 600 mg IV q8h
Suspicion de SARM	Ajouter vancomycine 1 g IV q12h (15mg/kg/dose)	
Suspicion de P. *aeruginosa*	Ciprofloxacine 750 mg PO bid OU 400 mg IV q12h + Ceftazidime 1-2 g IV q8h OU Pip-Tazo 3.75 g IV q8h (ou 4.5g IV q6-8h)	Ciprofloxacine 750 mg PO bid OU 400 mg IV q12h + Méropenem 500 g IV q8h

Durée de traitement : **5 jours** (pt immunocompétent) – **7 jours** (pneumonie bilatérale, maladie pulmonaire structurale, immunosuppression modérée) – **10 jours** (rare, immunosuppressions significative, réponse clinique lente)

Pneumonie d'aspiration aigue	Première ligne	Deuxième ligne
Antibiotiques requis si occlusion intestinale, augmentation du pH, symptômes qui persistent >48-72h après aspiration, infection sévère	Ceftriaxone 1-2 g IV q24h ou Lévofloxacine 750 mg PO/IV q24h	
Considérer couverture anaérobie si Abcès du poumon, nécrose, aspiration chronique	Ajouter Metronidazole 500 mg PO/IV q8h	Amoxi-clav 500 mg PO tid OU 850mg po bid

Pneumonie acquise en hôpital (incluant PAV)	Première ligne	Deuxième ligne
Aucun facteur de risque pour pathogènes multi-résistants	Ceftriaxone 1-2 g IV q24h OU Lévofloxacine 750 mg PO/IV q24h OU Pip-Tazo 3.75 g IV q8h	
Facteurs de risque(FR) pour pathogènes multi-résistants Durée de séjour ≥ 5 jours, thérapie antimicrobienne dans les 90 jours précédents, immunosuppression ou sepsis sévère, USI	Ceftazidime 2 g IV q8h OU Pip-Tazo 4.5 g IV q8h + Ciprofloxacine 400 mg IV q8h OU Gentamycine 5-7 mg/kg IV q24h	
Suspicion de SARM	Ajouter vancomycine 1 g IV q12h (15 mg/kg/dose)	

Durée de traitement : **7-8 jours** et **jusqu'à 14-21 jours** pour *P. aeruginosa* et SARM.

Exacerbation MPOC ou bronchite chronique	Première ligne	Deuxième ligne
Simple	Amoxicilline 500 mg PO tid OU Cefturoxime 500 mg PO bid	Doxycycline 100 mg PO bid x 24h puis die OU Septra DS 1 co PO bid
Compliquée VEF < 50% valeur prédite, atteinte cardiaque significative (insuffisance cardiaque, maladie ischémique), usage d'antibiotique durant les 3 mois précédents, usage chronique de stéroïdes, oxygénothérapie ou ≥ 4 exacerbations/an.	Amox-Clav 500 mg PO tid OU 875 mg PO bid	Lévofloxacine 500 mg PO die
FR pour *P. aeruginosa*	Ciprofloxacine 500 mg PO bid	

Durée de traitement : **5 jours** pour exacerbation simple, 7-10 jours pour exacerbation compliquée et *P. aeruginosa*.

Infections intra-abdominales

Infections intra-abdominales	Première ligne	Deuxième ligne
Légère à modérée - infection acquise en communauté de présentation légère à modérée	Ceftriaxone 1-2 g IV q24h + Métronidazole 500 mg IV q8h	Ciprofloxacine 400 mg IV q12h + Métronidazole 500 mg IV q8h
Sévère - infection nosocomiale - infection acquise en communauté de présentation sévère	Pip-Tazo 3.375 g IV q6h	Ciprofloxacine 400 mg IV q12h + Métronidazole 500 mg IV q8h

Durée de traitement : **7-14 jours.**

Infections de la peau et des tissus mous

Cellulite/ Ostéomyélite	Première ligne	Deuxième ligne
Simple	Céphalexine 500 mg PO qid	Cloxacilline 500 mg PO qid
Sévère	Céfazoline 2 g IV q8h	Cloxacilline 2g IV q4-6h ETOU Clindamycine 600 mg IV q8h
Suspicion de SARM	Vancomycine 1 g IV q12h (15 mg/kg/dose)	
Si articulation prothétique	Ajouter Rifampin 300 mg po q8h	Ajouter Rifampin 300 mg po q8h

Durée de traitement : **5-14 jours**, mais variable selon amélioration clinique.

Fasciite nécrosante	Première ligne	Deuxième ligne
Associée à *Streptococcus*	Clindamycine 900 mg IV q8h + Pénicilline G 4 millions d'unités/jour IV q4h OU Céfazoline 2 g IV q8h	Clindamycine 900 mg IV q8h + Vancomycine 1g IV q12h (15 mg/kg/dose)
Polymicrobienne	Pip-Tazo 3,375 g IV q6h + Clindamycine 600 mg IV q8h + Ciprofloxacine 400 mg IV q12h	

Durée de traitement : variable, **minimum 10 jours** et jusqu'à ce que les procédures chirurgicales ne soient plus nécessaire et amélioration clinique.

Infection du pied diabétique	Première ligne	Deuxième ligne
Légère à modérée (habituellement monomicrobienne)	Céfazoline 2 g IV q8h +/- Métronidazole 500 mg PO/IV q8h si on suspecte la présence de bactéries anaérobies	Amox-Clav 500 mg PO tid ou 875 mg PO bid
Sévère (habituellement polymicrobienne)	Céfazoline 2 g IV q8h + Ciprofloxacine 500 mg PO bid +/- Métronidazole 500 mg PO/IV q8h	Ceftriaxone 1-2 g IV q24h +/- Métronidazole 500 mg PO/IV q8h

Considérer couvrir SARM dans les cas suivants : régions où SARM est fréquemment isolé (>10-15% de *S. aureus*), patients avec antécédent d'infection à SARM, colonisés par SARM, ayant fait usage d'antibiotique ou ayant été admis à l'hôpital dans les derniers 6-12 mois.

Durée de traitement : **7-14 jours** pour une infection légère à modérée et **14-28 jours** pour une infection sévère.

Infection du site chirurgical	Première ligne	Deuxième ligne
Localisations intestinale, génitale, périnéale, inguinale	Ciprofloxacine 500 mg PO bid ou 400 mg IV q12h + Métronidazole 500 mg PO/IV q8h	Pip-Tazo 3,375 g IV q6h
Autres régions	Céfazoline 2 g IV q8h	Clindamycine 300-450 mg PO qid ou 600 mg IV q8h

Durée de traitement : **3-7 jours** pour une infection légère à modérée et **7-14 jours** pour une infection sévère.

Morsures d'animaux et d'humains	Première ligne	Deuxième ligne
Infection légère	Amox-Clav 500 mg PO tid ou 875 mg PO bid	Doxycycline 100 mg PO bid jr 1 puis 100 mg PO die
Infection modérée à sévère	Ceftriaxone 2 g q24h +/- Métronidazole 500 mg IV/PO q8h	Pip-Tazo 3,375 g IV q6h

Durée de traitement : **7-14 jours**.

Endocardite

Endocardite	Première ligne	Deuxième ligne
Valve native, valve prosthétique et utilisateurs de drogues IV Obtenir 3 échantillons d'hémocultures avant de débuter la thérapie empirique.	Vancomycine 1 g IV q12h (15 mg/kg/dose) + Gentamicine 1 mg/kg IV q8h + Ceftriaxone 2 g IV q12h	Vancomycine 1 g IV q12h (15mg/kg/dose) + IV Gentamicin 1 mg/kg q8h + Ciprofloxacin 500 mg PO q12h ou 400 mg IV q12h
Valve prosthétique	Ajouter Rifampin 300 mg po q8h	Ajouter Rifampin 300 mg po q8h

Durée de traitement : dépend de la bactérie (*streptocoque, enterocoque, ou staph*) et si le patient a une valve native ou non.

Sepsis

Sepsis	Première ligne	Deuxième ligne
Source inconnue	Pip-Tazo 3,375 g IV q6h ou 4,5 g IV q8h si suspicion *P. aeruginosa* +/- Vancomycine 15-20 mg/kg/dose q12h si SARM suspecté	Ceftazidime 2g IV q8h OU Méropenem 500 mg IV q8h +/- Vancomycine 15-20 mg/kg/dose IV q12h si SARM suspecté
Neutropénie, immunosuppression :	Considérer ajouter un 2e agent couvrant *P. aeruginosa*.	

Infections du SNC

Méningite	Première ligne	Deuxième ligne
18-50 ans	Dexaméthasone 10mg IV q6h x 4 jrs + Ceftriaxone 2 g IV q12h + Vancomycine 15-20 mg/kg/dose IV q12h	Dexaméthasone 10mg IV q6h x 4 jrs + Méropénem 2 g IV q8h + Vancomycine 15-20 mg/kg/dose IV q12h
> 50 ans, alcoolisme, immunosuppression	Dexaméthasone 10mg IV q6h x 4 jrs + Ceftriaxone 2 g IV q12h + Ampicilline 2 g IV q4h + Vancomycine 15-20 mg/kg/dose IV q12h	Dexaméthasone 10mg IV q6h x 4 jrs + Méropénem 2 g IV q8h + Vancomycine 15-20 mg/kg/dose IV q12h
Trauma crânien pénétrant, shunt LCR (drain) et neurochirurgie	Ceftazidime 2 g IV q8h + Vancomycine 15-20 mg/kg/dose IV q12h	
HSV encéphalite	Acyclovir 10 mg/kg/dose IV q8h + Fluides IV	

Durée de traitement : *Meningocoque et H. influenzae* : **7-10 jours** ; *Pneumocoque* : **10-14 jours** ; autres : **14-28 jours**.

Infections génito-urinaires

Infections génito-urinaires	Première ligne	Deuxième ligne
Cystite non compliquée (femme < 65 ans)	TMP-SMX (Septra) DS 1 co PO bid x 3 jrs	Ciprofloxacine 250 mg PO bid x 3 jrs
Cystite compliquée[1]		
Légère à modérée	TMP-SMX (Septra) DS 1 co PO bid x 7-10 jr OU Ciprofloxacine 500 mg PO bid x 3-7 jr	Ciprofloxacine 500 mg PO bid x 7 jr
Sévère	Ampicilline 1 g IV q6h x 10-14 jr + Gentamicine 5 mg/kg IV q24h x 10-14 jr[2]	Ciprofloxacine 400 mg IV q12h x 10-14 jr OU Ceftriaxone 1-2 g IV q24h x 10-14 jr
Pyélonéphrite aiguë		
Légère à modérée	Ciprofloxacine 500 mg PO bid x 7 jr	Amox-Clav 500 mg PO tid x 10-14 jr
Sévère	Ampicilline 1 g IV q6h x 10-14 jr + Gentamicine 5 mg/kg IV q24h x 10-14 jr[2]	Ciprofloxacine 400 mg IV q12h x 7-10 jr
Prostatite	Légère à modérée :	
Aigue	Ciprofloxacine 500 mg PO bid x 2-4 semaines Sévère : Ampicilline 1-2 g IV q6h x 2-4 semaines + Gentamicine 5 mg/kg IV q24h x 2-4 semaines[2]	TMX-SMX DS 1 co PO bid x 2 -4 semaines Ciprofloxacine 400 mg IV q12h x 2-4 semaines
Chronique	Ciprofloxacine 500 mg PO bid x 4-12 semaines	TMX-SMX DS 1 co PO bid x 8-12 semaines

[1] Homme, femme agée de > 65 ans, porteurs de sonde urinaire ou cathéter urinaire, infections urinaires hautes, anomalie de l'arbre urinaire, immunosuppression, diabète, symptômes évoluant depuis plus de 7 jours.

[2]Voir politique gentamicine pour plus de conseils.

Maladie inflammatoire pelvienne	Première ligne	Deuxième ligne
	Clindamycine 900 mg IV q8h + Gentamicine 5 mg/kg IV q24h + Passer à la voie PO lorsque possible avec doxycycline (100 mg bid) OU clindamycine (450 mg qid)	Lévofloxacine 500 mg IV q24h + Métronidazole 500 mg IV q8h

Durée de traitement : **14 jours**.

Clostridium *difficile*

Infection C. *difficile*	Première ligne	Deuxième ligne
Légère à modérée	Métronidazole 500 mg PO tid	Vancomycine 125 mg PO qid
Compliquée Admission à l'USI, hypotension, fièvre ≥ 38,5 °C, ileus ou distension abdominale, changements cognitifs, leucocytes ≥ 35 000/ mm3 ou < 2000/ mm, lactate sérique > 2,2 mmol/l, ou dysfonction d'organes (ex : insuffisance rénale).	Si ileus, mégacôlon toxique et/ou distension abdominale: Vancomycine 500 mg PO qid + Métronidazole 500 mg IV q8h + Vancomycine 500 mg/500 mL IR qid	Vancomycine : régime continu avec diminution progressive de la posologie ou régime intermittent

Durée de traitement : **10 jours.**

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Abréviations	
Amox-Clav	Amoxicilline-Clavulanate
LCR	Liquide céphalorachidien
FR	Facteurs de risque
h	Heure
Jr	Jour
PAV	Pneumonie associée à la ventilation
Pip-Tazo	Pipéracilline-Tazobactam
SARM	Staphylococcus *aureus* résistant à la méthicilline
TMP-SMX	Triméthoprim-sulfaméthoxazole
USI	Unité de Soins Intensifs

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