

Simmering the Stew: Ingredients for Building and Maintaining an Antimicrobial Stewardship Program



Marion Elligsen and Jennifer Lo
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Presenter Disclosure

- Presenter's Name: **Marion Elligsen**
- I have the Relationships with commercial interests:
 - Speaker/Consulting Fees: **Merck**
- Speaking Fees for current program:
 - I have received no speaker's fee for this learning activity

Presenter Disclosure

- Presenter's Name: **Jennifer Lo**
- I have no current or past relationships with commercial entities
- Speaking Fees for current program:
 - I have received no speaker's fee for this learning activity

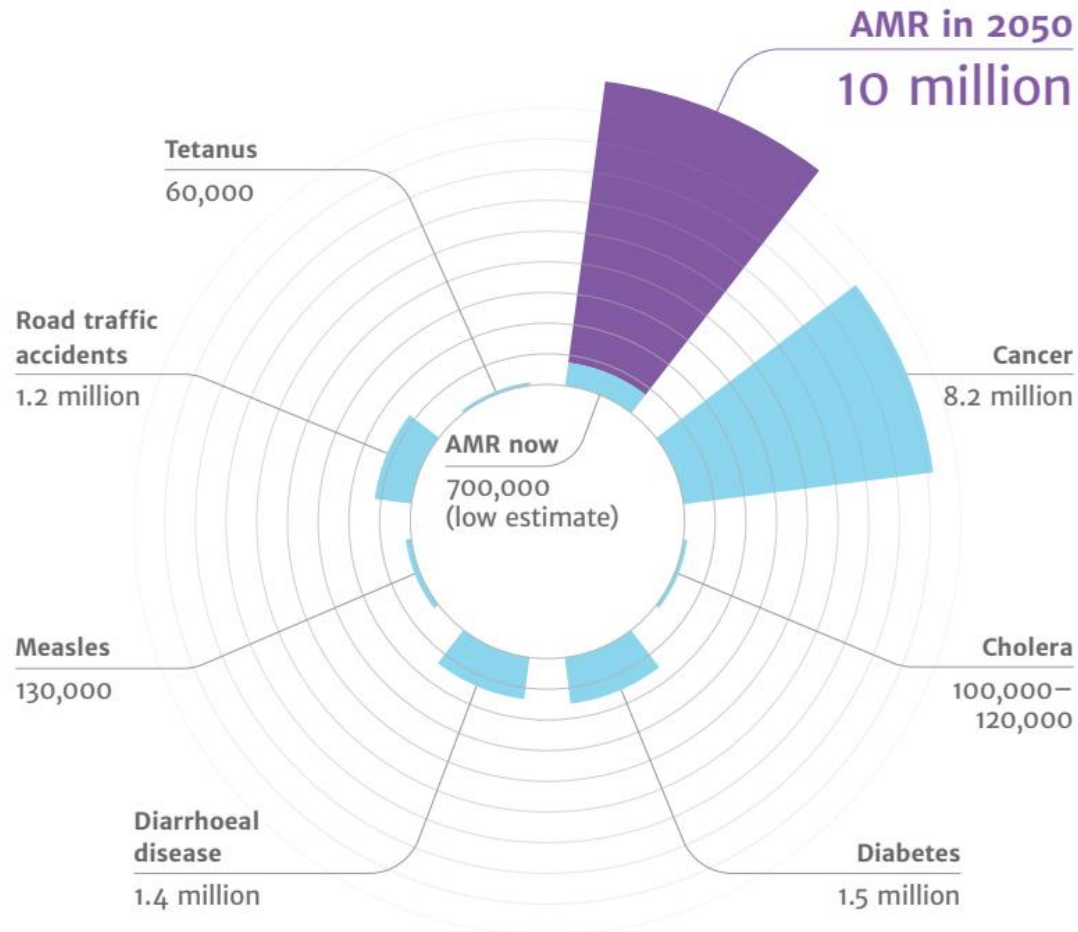
Commercial Support Disclosure

- This program has received no financial or in-kind support from any commercial or other organization

Learning Objectives

- By the end of this session, the learner will be able to:
 - 1. Describe and understand the key aspects of antimicrobial stewardship (AMS)**
 2. Review key components of the Sunnybrook AMS program
 3. Examine eight effective strategies for building and maintaining an AMS program

Antimicrobial Resistance is a Public Health Threat



When Antibiotics Fail

	In 2018...	By 2050...
Resistance	26% of infections are resistant to drugs generally used to treat them	Resistance rate likely to grow to 40%
Lives lost in Canada due to AMR	5,400 per year	13,700 per year
AMR costs to healthcare system	\$1.4 billion per year	\$7.6 billion per year

Managing Antimicrobial Resistance

Antimicrobial Stewardship	Surveillance
<ul style="list-style-type: none">• Prospective audit-and-feedback• Treatment guideline development• Microbiology cascade reporting• Microbiology antibiograms• Formulary restrictions• Prescriber education	<ul style="list-style-type: none">• Antimicrobial resistance• Antimicrobial use
Infection Prevention and Control	Other
<ul style="list-style-type: none">• Hand hygiene• Isolation precautions• Environmental disinfection	<ul style="list-style-type: none">• New antimicrobial therapies• Rapid diagnostics• Public Awareness• Policy changes

What is Antimicrobial Stewardship?

*“Coordinated interventions designed to improve and measure the appropriate use of [antibiotic] agents by promoting the selection of the optimal [antibiotic] drug **regimen** including **dosing**, **duration** of therapy, and **route** of administration”*

Antimicrobial Stewardship Programs in Canada

- Since 2013, antimicrobial stewardship has been an Accreditation Canada Required Organizational Practice (ROP) for facilities providing inpatient acute care, inpatient cancer, inpatient rehabilitation and complex continuing care services.



Accreditation Canada Required Organizational Practice in Acute Care



MAJOR

1. An antimicrobial stewardship program has been implemented.
2. The program specifies who is accountable for implementing the program.
3. The program is interdisciplinary, involving pharmacists, infectious diseases physicians, infection control specialists, physicians, microbiology staff, nursing staff, hospital administrators, and information system specialists, as available and appropriate.
4. The program includes interventions to optimize antimicrobial use.

MINOR

1. The program is evaluated on an ongoing basis and results are shared with stakeholders in the organization.

Learning Objectives

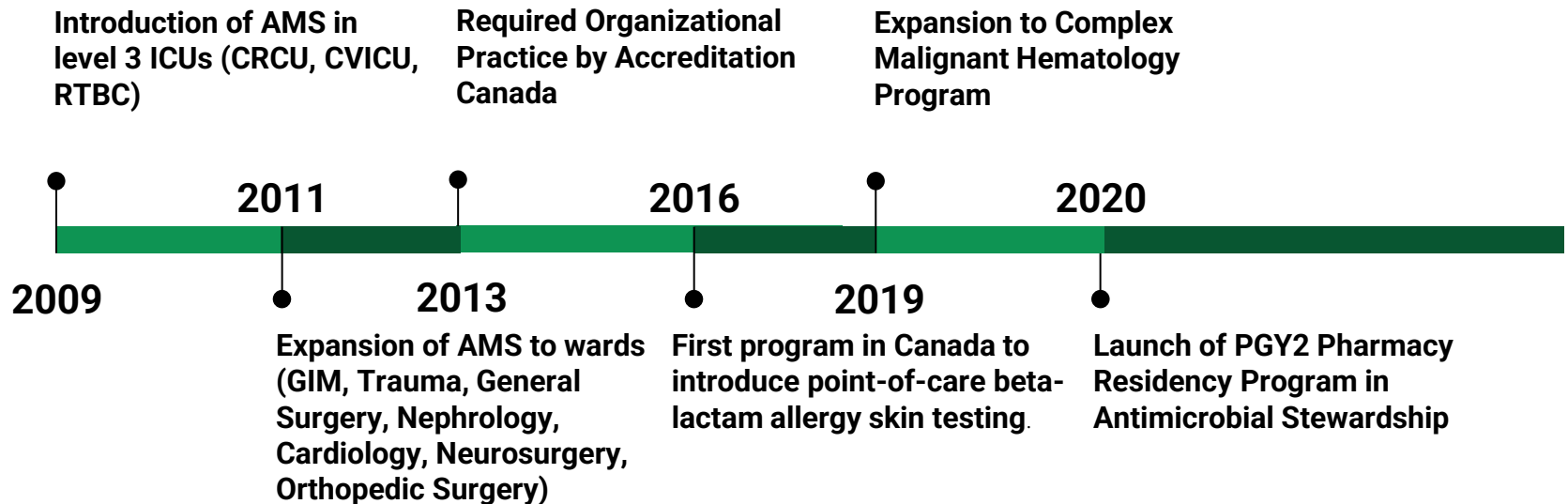
- By the end of this session, the learner will be able to:
 1. Describe and understand the key aspects of antimicrobial stewardship (AMS)
 2. **Review key components of the Sunnybrook AMS program**
 3. Examine various effective strategies for building and maintaining an AMS program

**Q#1. What strategies are used in your
practice setting to promote
Antimicrobial Stewardship principles**

(select all that apply)

- a) Antibiotic Restrictions
- b) Antibiotic order forms or order sets
- c) Audit-and-Feedback
- d) Lab-based interventions
- e) Education
- f) Guidelines
- e) Other

Antimicrobial Stewardship at Sunnybrook Health Sciences Centre



Sunnybrook Audit and Feedback Program



- SPIRIT database identifies all patients admitted to Level 3 ICU and wards on day 3, 7 or 14 of broad-spectrum antibiotics



- AMS Pharmacist work-up of all identified patients via electronic & paper charts
- Identify opportunities to optimize therapy & formulate suggestions



- AMS Pharmacist reviews & formalizes suggestions with ID physician on service



- AMS Pharmacist communicates suggestions to MRP and write assessment note in SunnyCare

Antimicrobial Stewardship Work-Up

Does this patient need an antimicrobial?

YES

NO

Optimize:

- Antimicrobial selection
- Dosing
- Route
- Duration of therapy

To Maximize

Clinical Cure

or

Prevention of Infection

Limit:

- Inappropriate antimicrobial use

To Minimize

Unintended Consequences:

- Emergence of resistance
- Adverse drug events
- Selection of pathogenic organisms (e.g., *C. difficile*)
- Cost

- Dellit T. *et al*, IDSA/SHEA Guidelines for Developing an Institutional Program to Enhance Antimicrobial Stewardship. CID 2007; 44: 159-77.

Antimicrobial Stewardship at Sunnybrook Health Sciences Centre

Clinical

- Audit and feedback program
- Guideline development
- Order set development

Research and Quality Improvement

- IDEAS (1)
- Long-term sustainability and Acceptance of ASP in ICU (2)

Education

- Clinical rotations for pharmacy and medical trainees
- Year 2 residency program
- Education sessions
- Clinical shadowing

1. Clin Infect Dis 2021; 73(2): e417 – e425.
2. Crit Care Med 2021; 49 (1): 19 – 26.

Learning Objectives

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 1. Describe and understand the key aspects of antimicrobial stewardship (AMS)
 2. Review key components of the Sunnybrook AMS program
 3. **Examine various effective strategies for building and maintaining an AMS program**

Q#2. What is the most common cause of inappropriate antibiotic prescribing you observe?

- a) Excessive durations
- b) Treatment of non-infectious presentations with antibiotics
- c) Treating cultures that represent colonization or contamination
- d) Unnecessary prophylaxis

#1. Use system-based solutions for common problems

- Addressing reflexive prescribing
 - Antibiotic prescriptions started in response to a positive culture representing colonization or contamination rather than infection
 - Superficial Wound Swabs
 - Urine Cultures

System based solutions: Superficial Wound Swabs

Background:

- Superficial wound swabs are one of the most common clinical specimens submitted to hospital microbiology laboratories.
- However, their clinical utility is questionable as they often isolate organisms colonizing the external layers of the wounds and may trigger unnecessarily broad therapy.

Q score for rating acceptability of non-sterile swabs:

		Squamous epithelial cells			
Cells/LPF		0	1-9	10-25	>25
WBC cells	0	3	0	0	0
	1-9	3	0	0	0
	10-25	3	1	0	0
	>25	3	2	1	0

Green = Processed Swabs Red = Rejected Swabs

Microbiology Report

Comments from the Lab

Specimen Source: SKIN SWAB
 Special Requests: NONE
 Microscopy: Specimen will not be processed further as the microscopic exam shows epithelial cells with minimal inflammation. Culture may re present colonization. If this was an operative or biopsy specimen, call 4242 within 48 hrs to request workup.
 Report Status: FINAL
 Report Status: 2021/05/05

Impact of Rejection of Low-Quality Wound Swabs on Antimicrobial Prescribing: A Controlled Before-After Study

Xavier Marchand-Senécal¹, Ian A Brasg², Robert Kozak¹, Marion Elligsen¹, Christie Vermeiren¹, Antoine J Corbeil¹, Kevin R Barker¹, Kevin Katz¹, Jeff E Powis^{3 4}, Wayne L Gold^{5 4}, Jerome A Leis^{1 4}

Affiliations + expand

PMID: 33511234 PMID: PMC7813205 DOI: 10.1093/ofid/ofaa609

	Baseline		Intervention	
	Low-quality n=140	High-quality N=82	Low-quality N=242	High-quality N=192
Reflexive antibiotic prescription	14 (10.0)	6 (7.3)	11 (4.5)	18 (9.4)
Discontinuation of antibiotic by Day 5	6 (4.3)	6 (7.3)	23 (9.5)	14 (7.3)

System-based solutions: Urine cultures

Background:

	Low Colony Count (10^4 to 10^5 CFU/mL)	High Colony Count ($\geq 10^5$ CFU/mL)
N	349	333
Clinical status		
Asymptomatic bacteriuria	314 (90)	272 (82)
UTI	35 (10)	61 (18)
Bacteremic UTI	6 (2)	10 (3)
Outcome		
Treatment of ASB	83 (38)	121 (50)
Average DOT per patient for ASB	2.21	2.82

Smith MA, Puckrin R, Lam PW, Lamb MJ, Simor AE, Leis JA. Association of Increased Colony-Count Threshold for Urinary Pathogens in Hospitalized Patients With Antimicrobial Treatment. JAMA Intern Med. 2019 Jul 1;179(7):990-992.

System-based solutions: Urine cultures

Intervention:

Comments from the Lab

Specimen Source: URINE, MIDSTREAM

Special Requests: NONE

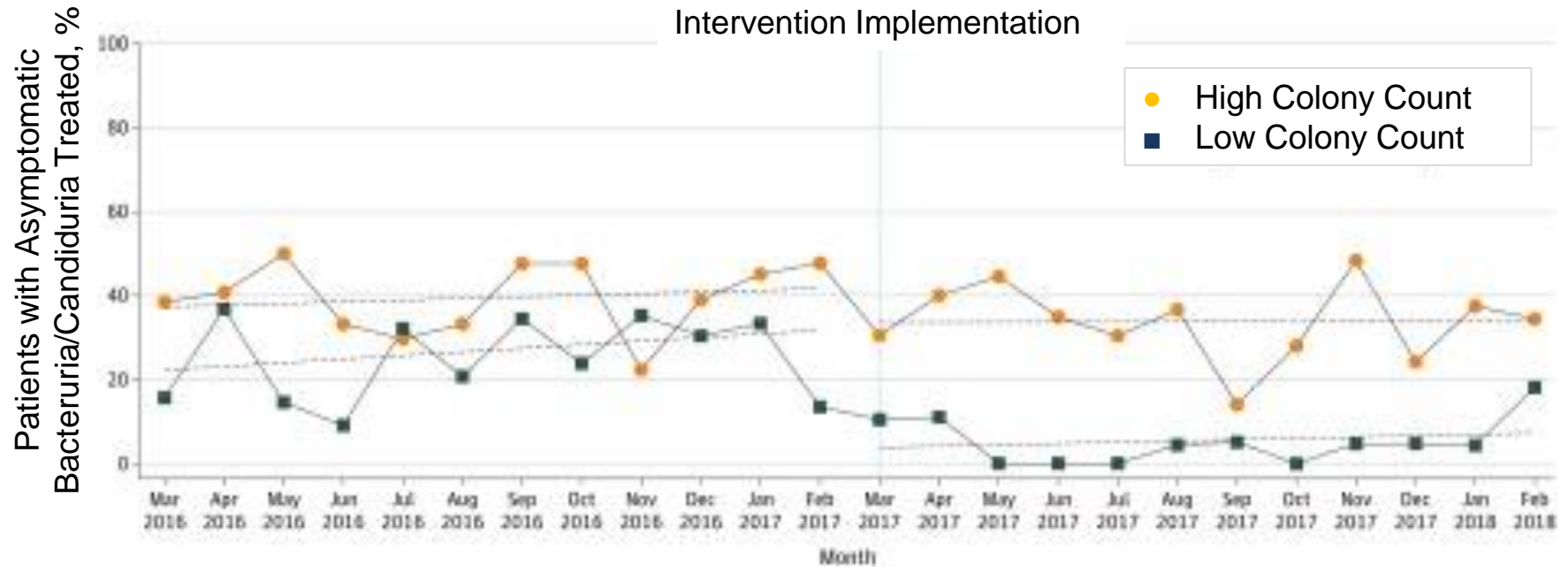
Culture: Low colony counts of organisms. This usually represents asymptomatic bacteriuria or contamination, not requiring treatment. If patient is pregnant, will have a urological procedure or has typical UTI symptoms, call Shared Hospital Laboratory within

Culture: 48 hours to request further workup.

Report Status: FINAL

Report Status: 2020/11/16

System-based solutions: Urine cultures



Smith MA, Puckrin R, Lam PW, Lamb MJ, Simor AE, Leis JA. Association of Increased Colony-Count Threshold for Urinary Pathogens in Hospitalized Patients With Antimicrobial Treatment. *JAMA Intern Med.* 2019 Jul 1;179(7):990-992.

#2. Make friends

- Information Technology/Systems
- Microbiology
- Medical and nursing teams
- Other hospitals



#3. Treat your peer group with respect

- Respect the practices of other pharmacists
- Give them the tools and assistance to apply AMS principles
- Listen to their concerns – we don't know what we don't see, and they see so much more than we possibly can!



#4. Find strong physician champions

- Physician leadership is important
- They should be compensated for their time
- Our model involves all of the ID staff
 - Stipend split among all the ID on-call for their time to review AMS cases
 - Dedicated funding for Medical Director of AMS



Nick Daneman
2009 - 2014



Jerome Leis
2014 - 2020









Philip Lam
2020 - present



#5. Inspire others to be chAMpS

- Examples: PGY2, PGY1 rotations, TTR, ID Fellows
- While a lot of work – pays to have to opportunity to shape their practice early in their career

PGY2 AMS Pharmacy Residents		PGY1 Pharmacy Resident	APPE Pharmacy Students		MSc Pharmacy Student
					
Jenny Curran ASP Pharmacotherapy Specialist, Sinai Health System/ University Health Network	Marina Simeonova CPS - Infectious Diseases and Antimicrobial Stewardship, Island Health	Linda Li ASP Pharmacist, North York General Hospital	Stephanie Hsieh ASP Pharmacist, Scarborough Health Network	Allison Barre Clinical Pharmacist/Infectious Disease Clinic Pharmacist, Southlake Regional Health Centre	Renaud Roy ICU and Infectious Diseases Pharmacist, Jewish General Hospital

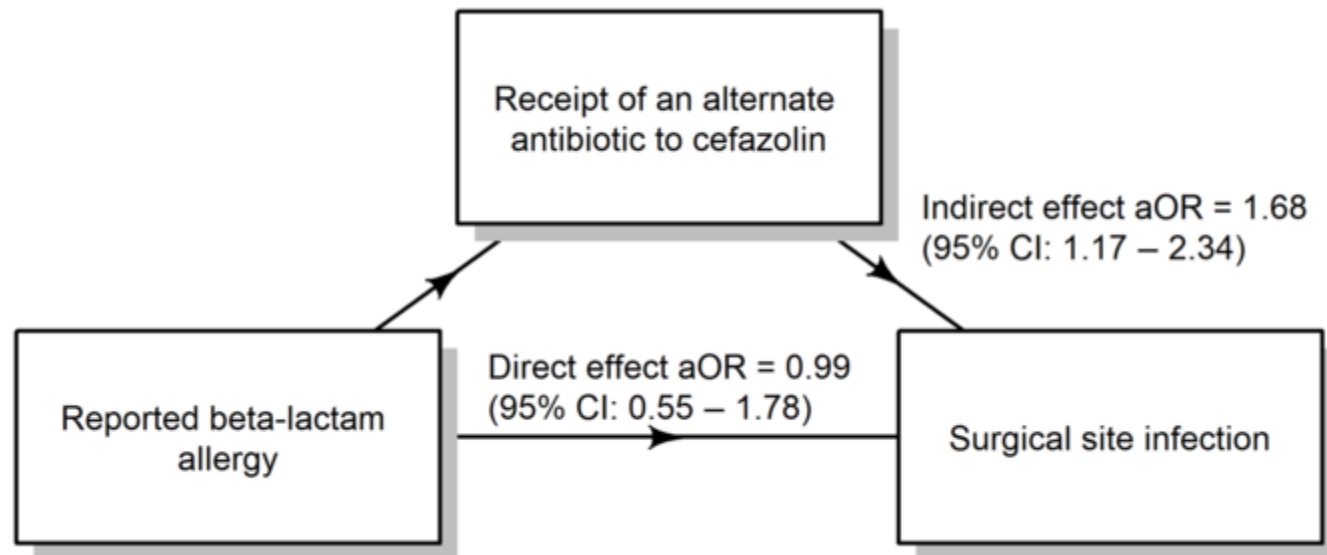
6. Get Data

- IF you think there's a problem – review the charts (students!!), create “the burning platform” for change

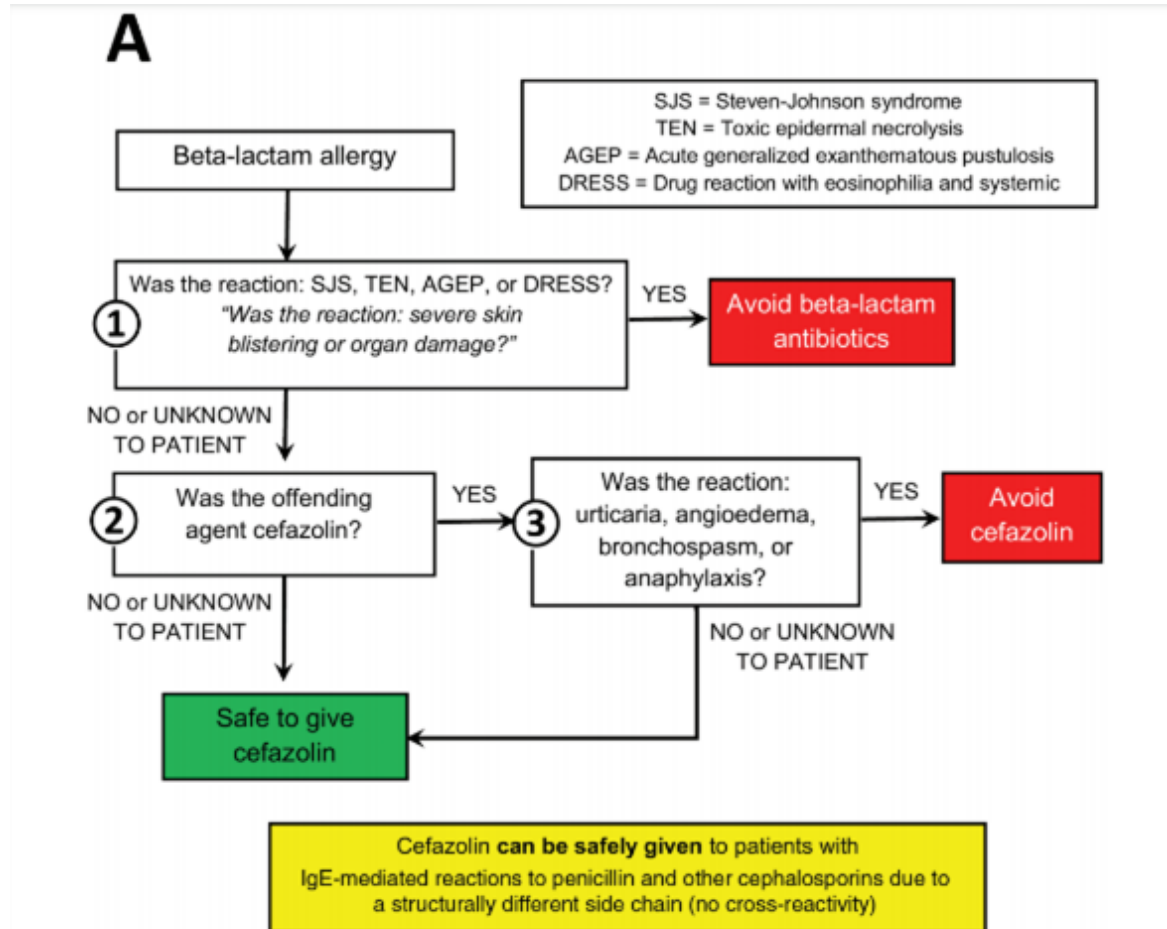


Improving Pre-operative Cefazolin Use in Patients with Reported Beta-Lactam Allergy Undergoing Elective Surgery

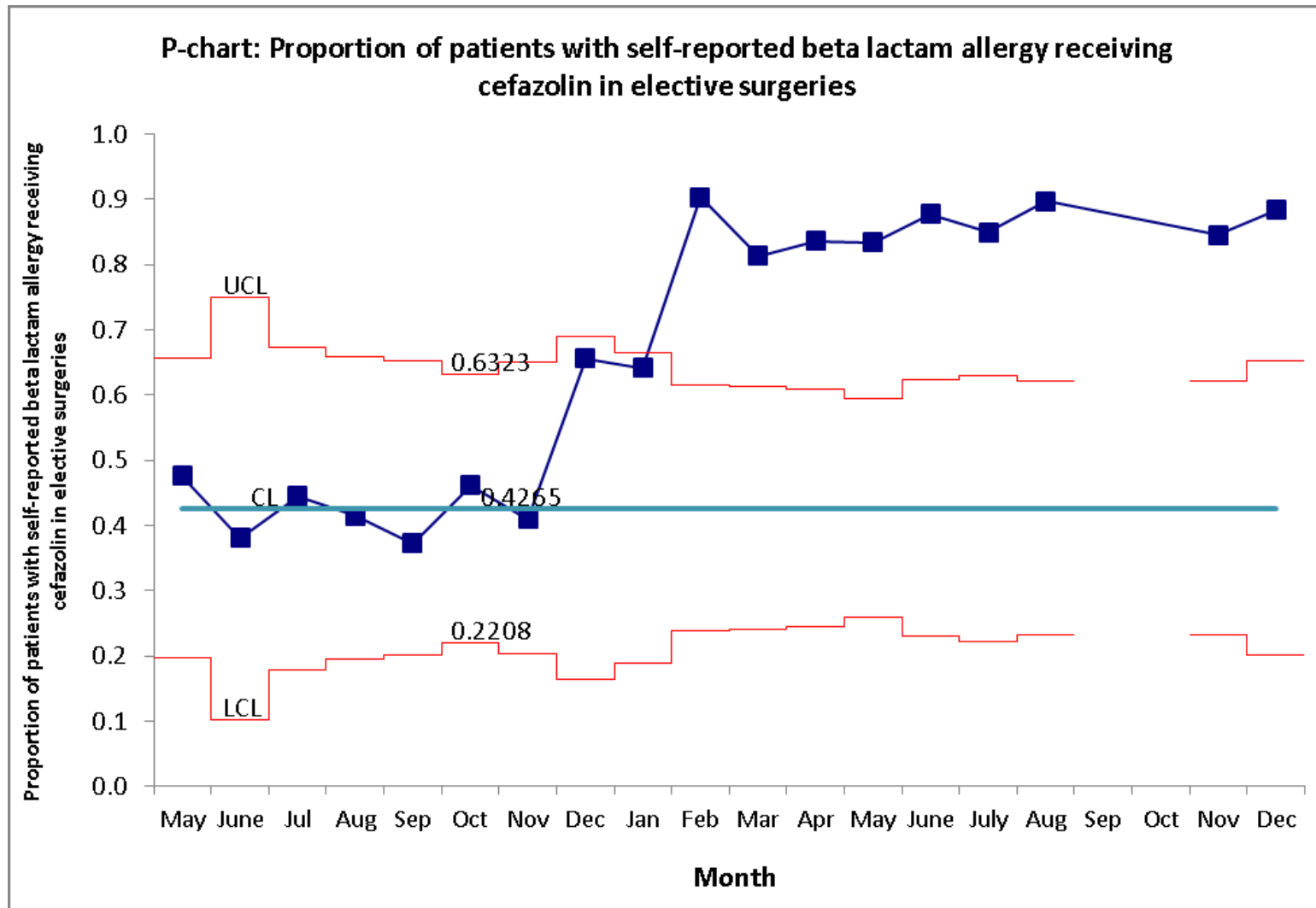
MSc Thesis by: Dr. Philip Lam



Improving Pre-operative Cefazolin Use in Patients with Reported Beta-Lactam Allergy Undergoing Elective Surgery



Improving Pre-operative Cefazolin Use in Patients with Reported Beta-Lactam Allergy Undergoing Elective Surgery



Improving Intrapartum Group B Streptococcus Prophylaxis in Patients with a Reported Penicillin or Cephalosporin Allergy: A Quality Improvement Project Residency project by: Linda Li

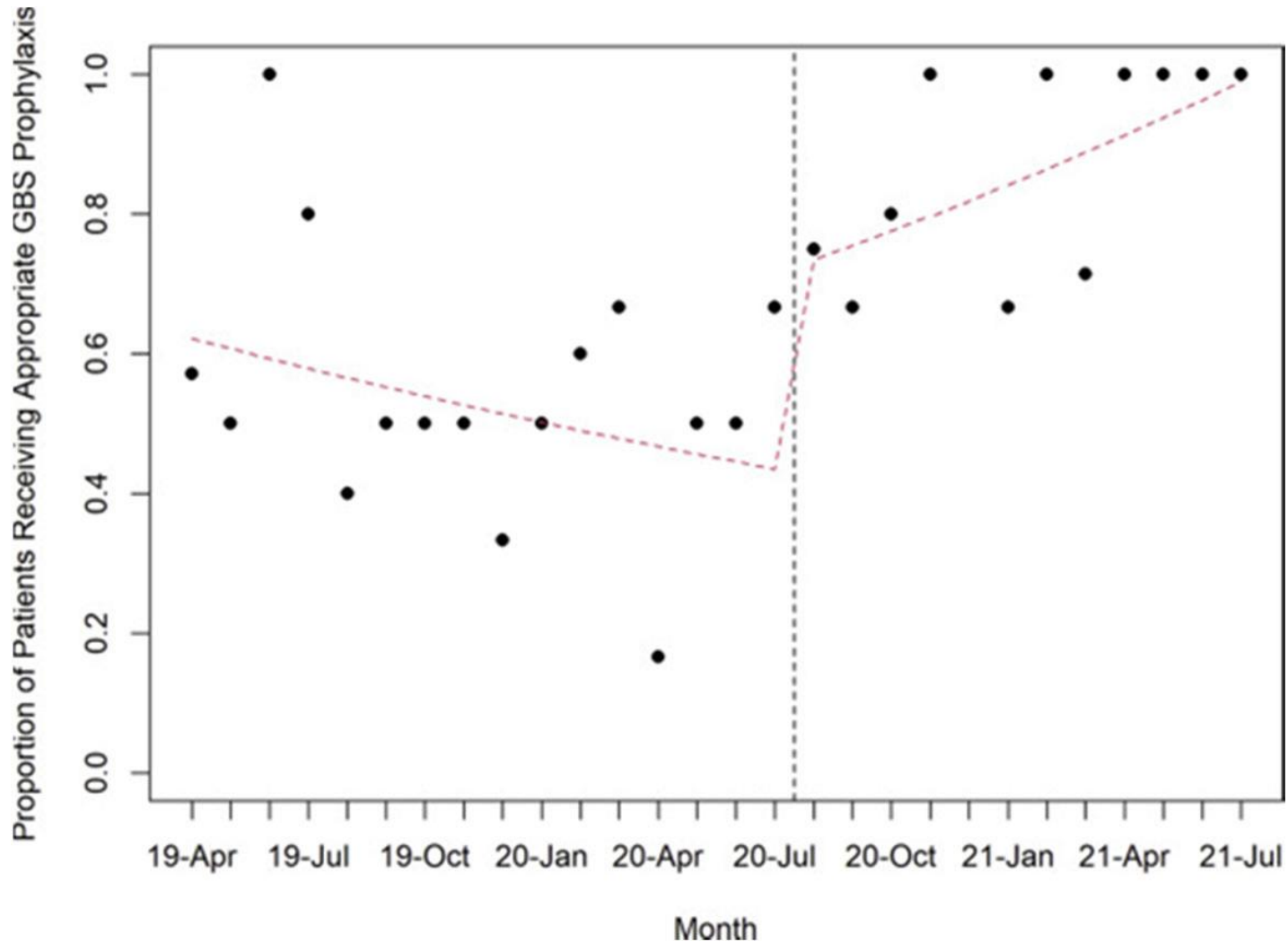
Background:

- Penicillin G is the drug of choice for neonatal Group B Streptococcus (GBS) prophylaxis, while use of non-beta-lactam agents have been frequently used for patients with severe IgE-mediated reactions.
- There is strong evidence that demonstrates cefazolin can be safely used in patients with a history of penicillin allergy.

Intervention:

- Modified order sets and educational interventions were implemented in the Womens and Babies Program in July 2020.

Improving Intrapartum Group B Streptococcus Prophylaxis in Patients with a Reported Penicillin or Cephalosporin Allergy: A Quality Improvement Project



#7. Build Your Resources

- Shared resources
 - Clinical Guidelines
 - Antibiograms
 - Educational Materials
- Reaching out to your AMS/healthcare/other colleagues
 - Twitter
 - FirstLine

Q#3. Do you have access to a local antibiogram?

- a) Yes
- b) Yes - but it's outdated
- c) No
- d) I don't know

Build Your Resources: Clinical Guidelines

National/International
Guidelines

Regional/Local
Guidelines

Institutional Guidelines

AMERICAN THORACIC SOCIETY DOCUMENTS

Diagnosis and Treatment of Adults with Community-acquired Pneumonia

An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America

Joshua P. Metlay*, Grant W. Waterer*, Ann C. Long, Antonio Anzueto, Jan Brozek, Kristina Crothers, Laura A. Cooley, Nathan C. Dean, Michael J. Fine, Scott A. Flanders, Marie R. Griffin, Mark L. Metersky, Daniel M. Musher, Marcos I. Restrepo, and Cynthia G. Whitney; on behalf of the American Thoracic Society and Infectious Diseases Society of America

THIS OFFICIAL CLINICAL PRACTICE GUIDELINE WAS APPROVED BY THE AMERICAN THORACIC SOCIETY MAY 2019 AND THE INFECTIOUS DISEASES SOCIETY OF AMERICA AUGUST 2019

Background: This document provides evidence-based clinical practice guidelines on the management of adult patients with community-acquired pneumonia.

Methods: A multidisciplinary panel conducted pragmatic systematic reviews of the relevant research and applied Grading of Recommendations, Assessment, Development, and Evaluation methodology for clinical recommendations.

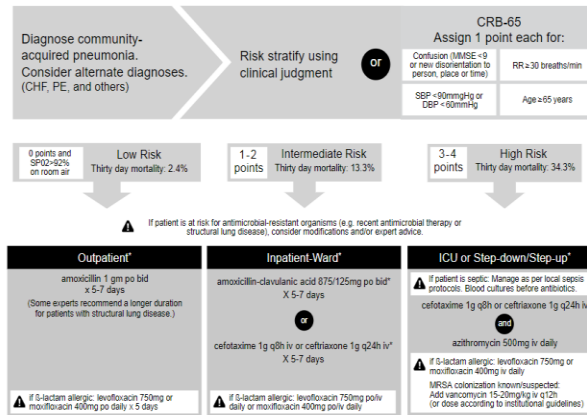
Results: The panel addressed 16 specific areas for recommendations spanning questions of diagnostic testing, determination of site of care, selection of initial empiric antibiotic therapy, and subsequent

management decisions. Although some recommendations remain unchanged from the 2007 guideline, the availability of results from new therapeutic trials and epidemiological investigations led to revised recommendations for empiric treatment strategies and additional management decisions.

Conclusions: The panel formulated and provided the rationale for recommendations on selected diagnostic and treatment strategies for adult patients with community-acquired pneumonia.

Keywords: community-acquired pneumonia; pneumonia; patient management

Management of Community-Acquired Pneumonia in Adults[§]



§ In most circumstances, these guidelines apply equally to patients residing in long-term care institutions (e.g., Nursing Homes).

*Routine coverage of atypical bacteria has not been proven to be of benefit in this setting. In Ontario the highest risk period for Legionella is June to October; during this period consider adding azithromycin 500 mg po or iv. Please see FAQ 2 for explanation.



Pneumonia (community acquired)



Guidelines for Empiric Treatment

- The approach to the management of community-acquired pneumonia (CAP) is dependent on the severity of presentation and individual patient factors (i.e., presence of structural lung disease).
- The following guidelines are for the empiric management of CAP in adults who require hospitalization and are not significantly immunocompromised. Antimicrobial therapy should be modified based upon gram stain and culture results and clinical response.

Organisms

- Streptococcus pneumoniae
- Haemophilus influenzae
- Chlamydia pneumoniae
- Mycoplasma pneumoniae

Treatment: Choose one of the two options below

Regimen	Dosing	Notes
β-lactam + Macrolide	Ceftriaxone 1g IV q24h Azithromycin 500mg IV q24h OR 500mg PO day 1, then 250-500mg PO q24h	Options for oral step-down therapy from ceftriaxone include: <ul style="list-style-type: none"> Cefuroxime axetil 500mg PO BID Amoxicillin/clavulanic acid 875mg PO BID OR 500mg PO TID Cefixime 400mg PO daily

IDSA. <https://www.idsociety.org/>

SHS+UHN ASP. <https://www.antimicrobialstewardship.com>

Sunnybrook AMS App. <https://www.sunnybrook.ca/antimicrobialstewardship>

Build Your Resources: Regional Antibiograms

Ontario Hospital Antibiogram
 % Susceptible 2018-2021 Data
[Consult the Technical Notes for details about how this antibiogram was prepared](#)

Please select the buttons below to view antibiogram data by Gram stain and by LHIN

Gram stain
 Gram-negative (selected)
 Gram-positive

Region
 North West
 South East
 South West
Toronto Central
 Waterloo Wellington

	amikacin	Amoxicillin-Clavulanic acid	Ampicillin / Amoxicillin	Cefazolin	Ceftazidime	Ceftriaxone	Ciprofloxacin	Doxycycline	ertapenem	Gentamicin	levofloxacin	Meropenem	Nitrofurantoin (urine)	Piperacillin- Tazobactam	Tobramycin	Trimethoprim-Sulfamethoxazole																
<i>Acinetobacter sp.</i>	46	100			46	98	46	82		46	91	46	100	46	98	46	87															
<i>Citrobacter sp.</i>	164	100	88	0	164	0	88	0	88	293	93	293	100	53	85	164	93															
<i>Enterobacter sp.</i>	636	100	297	0	636	0	571	0	319	15	336	30	933	90	27	0	297	88	933	97	22	86	933	98	117	40	656	17	933	96	753	32
<i>Escherichia coli - ALL</i>	4441	93	3417	69	6130	37	3713	63	4020	81	5903	80	6131	67	499	18	2486	99	6130	89	146	67	6130	99	1976	95	5977	76	6126	86	6130	70
<i>Haemophilus influenzae</i>			177	66																												
<i>Klebsiella sp.</i>	1666	100	1134	82	2198	0	1653	69	1450	87	2154	83	2290	86			876	99	2290	93	42	96	2290	99	555	32	2240	84	2288	89	2290	85
<i>Morganella morganii</i>	95	100	44	0	96	0	88	0	44	0	96	0	134	83			44	100	134	92			134	99	32	0	96	54	134	93	134	81
<i>Pseudomonas aeruginosa</i>	2209	97							2649	87				85			2649	93		93	44	64	2623	88			2613	83	2649	97		
<i>Serratia sp.</i>	284	100	91	0	284	0	284	0	91	0	240	34	361	96			91	99	361	100			361	100	19	0	284	67	361	97	361	99

Last updated: March 2022

Public Health Ontario. Ontario hospital antibiogram, 2022
<https://www.publichealthontario.ca/en/health-topics/antimicrobial-stewardship/asp-comparison-tool>

Build Your Resources: Regional Antibigrams

Ontario Urinary Antibiogram
 % Susceptible, 2016-2017 Data
[Consult the Technical Notes for details about how this antibiogram was prepared](#)

Setting (select one ...): Inpatient, LTC, **Outpatient**

Age Group (select one o...): <18, 18-64, **65+**

Region (select one only): All LHINs, Central, Central East, Central West, Champlain, Erie St. Clair, Hamilton Niagara Brant, Mississauga Halton, North East, North Simcoe Muskoka, North West, South East, South West, Toronto Central, Waterloo Wellington

Row Labels	# Isolates	Amoxicillin	Cephalexin	Nitrofurantoin	Ciprofloxacin	TMP-SMX
All organisms	233391	45	78	77	85	81
<i>Acinetobacter</i> sp.	348	0	0	0	92	92
<i>Citrobacter freundii</i>	3440	0	0	94	96	88
<i>Citrobacter koseri</i>	3545	0	1	80	99	99
<i>Citrobacter</i> sp. Other	890	0	0	80	97	95
<i>Enterobacter cloacae</i>	4810	0	0	40	96	89
<i>Enterococcus faecalis</i>	2350	100	0	99	75	0
<i>Enterococcus faecium</i>	196	16	1	23	9	1
<i>Enterococcus</i> sp. Other	2884	95	0	95	53	0
<i>Escherichia coli</i>	150665	60	90	97	82	81
<i>Klebsiella aerogenes</i>	2495	0	0	17	98	98
<i>Klebsiella oxytoca</i>	4671	0	49	83	97	95
<i>Klebsiella pneumoniae</i>	28868	0	96	38	97	93
<i>Klebsiella</i> sp. Other	4924	0	93	49	97	95
<i>Morganella</i> sp.	2350	0	0	0	91	84
<i>Proteus mirabilis</i>	9594	86	93	0	95	86
<i>Proteus vulgaris</i>	340	0	0	0	98	87
<i>Pseudomonas aeruginosa</i>	5455	0	0	0	89	0
<i>Serratia</i> sp.	1083	0	0	1	96	97
<i>Staphylococcus aureus</i>	2857	2	81	80	51	99
<i>Staphylococcus</i> sp. Other	893	25	66	83	41	77

Last Updated: March 2022

Urinary “WISCA”

- Weighted-incidence syndromic combination antibiogram
- Urine culture and susceptibility data obtained from Ontario Laboratory Information System (OLIS) via ICES
- Data from Jan 1, 2016 to Dec 31, 2017 included

Public Health Ontario. Ontario hospital antibiogram, 2022
<https://www.publichealthontario.ca/en/health-topics/antimicrobial-stewardship/asp-comparison-tool>

Build Your Resources: Educational Materials

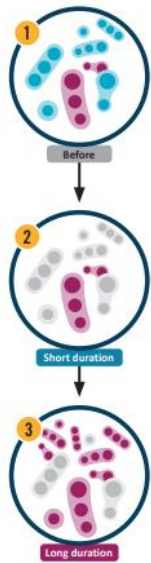
SHORTER IS SMARTER

Public Health Ontario | Santé publique Ontario

Prescribers/Clinicians:
Reducing duration of antibiotic therapy in long-term care

Antibiotic use drives selective pressure

Selective pressure kills susceptible bacteria and allows resistant organisms to thrive and multiply.



Shorter courses are as effective as longer courses

Uncomplicated cystitis		Pneumonia	
Short 3-6 days	Long 7-14 days	Short 5 days	Long 7-10 days

Cellulitis	
Short 5 days	Long 10 days

Based on studies in hospitalized and ambulatory patients for common infections seen in long-term care.

Shorter courses have a lower risk of harm



For more information, see [Reducing Duration of Antibiotic Treatment for Common Infections in Long-Term Care](#) or visit [publichealthontario.ca/ASPInLTC](https://www.publichealthontario.ca/ASPInLTC).



Public Health Ontario | Santé publique Ontario

Shorter is Smarter: Reducing Duration of Antibiotic Treatment for Common Infections in Long-Term Care

Cystitis

≤ 7 days

Key Points¹⁻³

- For uncomplicated cystitis, evidence supports 3 days of TMP-SMX (Septra, Bactrim) or ciprofloxacin, or 5 days of nitrofurantoin.
- For complicated cystitis, evidence supports 7 days of treatment. This includes males with cystitis, catheterized residents and urological abnormalities.
- For pyelonephritis, longer courses of 7 to 14 days is appropriate.
- Asymptomatic bacteriuria should NOT be treated in long-term care.

For more information see [Duration of Antibiotic Treatment for Uncomplicated Urinary Tract Infection in Long-Term Care](#).

Cellulitis

5-7 days

Key Points⁴

- Treatment for 5 to 7 days is appropriate as long as there has been some improvement in erythema, warmth, tenderness, or edema.
- Longer courses may be required for severe infections or infections without source control (e.g. requiring debridement).
- Diabetes alone is not an indication for a longer course.

For more information see [Duration of Antibiotic Treatment for Uncomplicated Cellulitis in Long-Term Care](#).

Pneumonia

5-7 days

Key Points^{5,6}

- Treatment for 5 to 7 days is appropriate in residents with pneumonia who are clinically stable and afebrile for 48-72 hours.
- Residents with extra-pulmonary infections or those with documented infections caused by *Pseudomonas* or *Staphylococcus* may require longer courses of treatment.

For more information see [Duration of Antibiotic Treatment for Pneumonia in Long-Term Care](#).

Shorter courses of antibiotics, when indicated, are as effective as longer courses with less risk of harm (antibiotic resistance, adverse effects, *C. difficile* infection).

1. Luffens M, Vign Ferrer NB. Antibiotic duration for treating uncomplicated, symptomatic lower urinary tract infections in elderly women. *Cochrane Database Syst Rev* 2018;(1):CD012024.
 2. Drinkhøj DM, Rector TS, Cutting A, Johnson JR. Urinary tract infection in male veterans: treatment patterns and outcomes. *JAMA Intern Med*. 2011;171(1):62-8.
 3. Houston TM, Bradley SS, Carstensen DG, Colgan R, Goering M, Rice JC, et al. Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America. *Clin Infect Dis*. 2010;50(2):142-63.
 4. Hagbom MI, Doolittle DP, Skidmore PE, Elin M, Starnon WE, Hasenwiler WC. Comparison of short course (5 days) and standard (10 days) treatment for uncomplicated cystitis. *Arch Intern Med*. 2006;166(2):169-74.
 5. Urrutia A, España P, Bilbao A, Quintana JM, Arriaga L, Intxausti M, et al. Duration of antibiotic treatment in community-acquired pneumonia: a multicenter randomized clinical trial. *JAMA Intern Med*. 2015;175(9):1257-65.
 6. Chastre J, Wolff M, Page R, Chover S, Thomas G, Wernmet D, et al. Comparison of 8 vs 15 days of antibiotic therapy for ventilator-associated pneumonia in adults: a randomized trial. *JAMA*. 2003;290(19):2588-98.



Build Your Resources: Reaching out to your colleagues

An AMS strategy
you are not
familiar with...?

How to improve
management of
intra-abdominal
infections?

AMS Colleagues

- Pharmacists
- Physicians
- Microbiology

Other Colleagues

- Content Experts
- Web Team
- IT Support

via

- Email
- Chat
- Listservs
- Twitter
- Message boards

#8. Where there is no evidence – try to find local consensus

- Identify areas of variability in clinical practice
- Work with stakeholders to develop standardized approach

- Examples:
 - Open fracture prophylaxis
 - Intra-abdominal infections

Developing Sunnybrook Open Fracture Prophylaxis Guidelines

1. Identifying a need for institutional guidance
2. Environmental scan of existing guidelines and practices
3. Review of existing literature
4. Developing preliminary guidelines
5. Input from external content experts (i.e., Orthopedic Surgeons, Physician Assistant)
6. Review and Approval by AMS team and hospital committees
7. Guideline dissemination



Guiding principles for open fracture management

Recommended prophylaxis based on clinical grading

Clinical grading	Etiology	Prophylaxis	Alternative*	Duration
Grade I (wound <1 cm, clean, simple fracture pattern)	Gram positive cocci (<i>S. epidermidis</i> , <i>S. aureus</i> , β-hemolytic streptococci) +/- Gram negative bacilli	Cefazolin 2g IV Q8H	Clindamycin 450mg PO Q6H	Discontinue 24 hours following soft tissue closure
Grade II (wound >1 cm, no extensive tissue damage, simple fracture pattern)	Gram positive cocci (<i>S. epidermidis</i> , <i>S. aureus</i> , β-hemolytic streptococci) +/- Gram negative bacilli	Cefazolin 2g IV Q8H	Clindamycin 450mg PO Q6H	Discontinue 24 hours following soft tissue closure
Grade IIIA (high energy mechanism, extensive soft tissue damage with adequate coverage)	Gram positive cocci (<i>S. epidermidis</i> , <i>S. aureus</i> , β-hemolytic streptococci) + Gram-negative bacilli	Ceftriaxone 1g IV Q24H [†]	Clindamycin 450mg PO Q6H + Tobramycin or Gentamicin 5-7mg/kg (ABW) Q24H	Up to 72 hours after injury but not greater than 24 hr following soft tissue closure
Grade IIIB (Grade IIIA with inadequate coverage, wound contamination)		Ceftriaxone 1g IV Q24H [†]	Clindamycin 450 mg PO Q6H + Tobramycin or Gentamicin 5-7mg/kg (ABW) Q24H	Up to 72 hours after injury but not greater than 24 hr following soft tissue closure
Grade IIIC (Grade IIIB with arterial injury requiring repair, concerns for limb preservation)		<u>OR</u> Cefazolin 2g IV Q8H+ Tobramycin or Gentamicin 5-7mg/kg (ABW) Q24H		If closure is not achieved within 72 hours of injury; use Ceftriaxone to reduce risk of toxicity associated with aminoglycosides



Sunnybrook AMS App.

<https://www.sunnybrook.ca/antimicrobialstewardship>

Learning Objectives

- By the end of this session, the learner will be able to:
 - ✓ 1. Describe and understand the key aspects of antimicrobial stewardship (AMS)
 - ✓ 2. Review key components of the Sunnybrook AMS program
 - ✓ 3. Examine eight effective strategies for building and maintaining an AMS program

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Thank You!

Do you have
any
Questions? 

marion.elligsen@sunnybrook.ca
jennifer.lo@sunnybrook.ca

How to Build a Case for an Inpatient Antimicrobial Stewardship Program



- AMMI Canada has developed a template for building a business case for an ASP funding
- They recommend the following resources for ASPs:
 - **Physician:** 1.0 FTE per 1000 acute care beds
 - **Pharmacist:** 3.0 FTE per 1000 acute care beds
 - **Administration:** 0.5 FTE per 1000 acute care beds
 - **Data Analyst:** 0.4 FTE per 1000 acute care beds