

KEY COMPONENTS OF PROFESSIONAL EDUCATION FOR ANTIMICROBIAL STEWARDSHIP

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Objectives

- Explain the regulatory requirements for Antimicrobial Stewardship (AS) education
- Discuss the strategy for education deployed within our health system
- Differentiate the components of education for pharmacist, providers and other professionals

BACKGROUND

Antibiotic Resistance in the United States

NATIONAL SUMMARY DATA

Estimated minimum number of illnesses and deaths caused by antibiotic resistance*:

At least **2,049,442** illnesses,
23,000 deaths

*bacteria and fungus included in this report

Estimated minimum number of illnesses and death due to *Clostridium difficile* (*C. difficile*), a unique bacterial infection that, although not significantly resistant to the drugs used to treat it, is directly related to antibiotic use and resistance:

At least **250,000** illnesses,
14,000 deaths

WHERE DO INFECTIONS HAPPEN?
Antibiotic-resistant infections can happen anywhere. Data show that most happen in the general community; however, most deaths related to antibiotic resistance happen in healthcare settings, such as hospital and nursing homes.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Center for Disease Control Prioritization of Antibiotic Resistance Threats

Urgent Threats	<ul style="list-style-type: none"> • <i>Clostridium difficile</i> • Carbapenem-resistant <i>Enterobacteriaceae</i> (CRE) • Drug-resistant <i>Neisseria gonorrhoeae</i>
Serious Threats	<ul style="list-style-type: none"> • Multidrug-resistant <i>Acinetobacter</i> • Drug-resistant <i>Campylobacter</i> • Fluconazole-resistant <i>Candida</i> (a fungus) • Extended spectrum β-lactamase producing <i>Enterobacteriaceae</i> (ESBLs) • Vancomycin-resistant <i>Enterococcus</i> (VRE) • Multidrug-resistant <i>Pseudomonas aeruginosa</i> • Drug-resistant Non-typhoidal <i>Salmonella</i> • Drug-resistant <i>Salmonella Typhi</i> • Drug-resistant <i>Shigella</i> • Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) • Drug-resistant <i>Streptococcus pneumoniae</i> • Drug-resistant tuberculosis
Concerning Threats	<ul style="list-style-type: none"> • Vancomycin-resistant <i>Staphylococcus aureus</i> (VRSA) • Erythromycin-resistant Group A <i>Streptococcus</i> • Clindamycin-resistant Group B <i>Streptococcus</i>

CDC, Antibiotic Resistance Threats in the United States (2013).

<https://www.cdc.gov/drugresistance/pdf/ar-threats-2013-508.pdf> [Accessed 12/16/16]

Core Elements of AS for Hospitals

CORE ELEMENTS OF ANTIBIOTIC STEWARDSHIP FOR HOSPITALS



LEADERSHIP COMMITMENT Dedicating necessary human, financial and information technology resources.



ACCOUNTABILITY Appointing a single leader responsible for program outcomes. Experience with successful programs show that a physician leader is effective.



DRUG EXPERTISE Appointing a single pharmacist leader responsible for working to improve antibiotic use.



ACTION Implementing at least one recommended action, such as systemic evaluation of ongoing treatment need after a set period of initial treatment (i.e. "antibiotic time out" after 48 hours).



TRACKING Monitoring antibiotic prescribing and resistance patterns.



REPORTING Regular reporting information on antibiotic use and resistance to doctors, nurses and relevant staff.



EDUCATION Educating clinicians about resistance and optimal prescribing.

Fairview Hospital Overview

11 hospitals across Minnesota

- Fairview Southdale Hospital (Edina)
- University of Minnesota Medical Center/University of Minnesota Masonic Children's Hospital (Minneapolis)
- Fairview Ridges Hospital (Burnsville)
- Fairview Lakes Medical Center (Wyoming)
- Fairview Northland Medical Center (Princeton)
- Fairview Range (Hibbing)
- Grand Itasca Clinic and Hospital (Grand Rapids)
- HealthEast St. Joseph's (St. Paul)
- HealthEast St. John's (Maplewood)
- HealthEast Bethesda LTAC (St. Paul)
- HealthEast Woodwinds Health Campus (Woodbury)





Fairview Antimicrobial Stewardship

- Site-Based Antimicrobial Stewardship Programs (ASP) established at each hospital
- Multi-disciplinary System Antibiotic Subcommittee
 - *Scope:* antimicrobial formulary reviews, policies, institutional guidelines, drug utilization, antibiotic resistance, and antibiogram



Fairview Hospital Historical AS Education

- Education pharmacy focused
 - System
 - Site specific
- Barriers in educating providers and non-pharmacist staff

New Regulatory Requirements



- Medication Management Standard MM.09.01.01
- Education is one required “Element of Performance”

Educational Requirements for MM.09.01.01

“The [critical access] hospital educates staff and licensed independent practitioners involved in antimicrobial ordering, dispensing, administration, and monitoring about antimicrobial resistance and antimicrobial stewardship practices. Education occurs upon hire or granting of initial privileges and periodically thereafter, based on organizational need.”



Fairview Compliance with Standard

- Fairview System Antibiotic Stewardship Steering Committee created in 2017
- Each hospital completed a gap analysis to assess compliance
- Formal education for AS was lacking and not standardized across the system

AS EDUCATION METHODS

AS Education Practices

Open Forum Infectious Diseases

MAJOR ARTICLE



Structure of Antimicrobial Stewardship Programs in Leading US Hospitals: Findings of a Nationwide Survey

Derrick Nhan,¹ Eric J. M. Lentz,² Marilyn Steinberg,³ Chaim M. Bell,^{1,3,4,5} and Andrew M. Morris^{1,3,4,5}

¹University of Toronto, Toronto, ON, Canada; ²Department of Medicine, McMaster University, Hamilton, ON, Canada; ³Sinai Health System, Toronto, ON, Canada; ⁴University Health Network, Toronto, ON, Canada; ⁵Department of Medicine, University of Toronto, Toronto, ON, Canada

Background. To examine antibiotic stewardship program (ASP) structure among high-performing hospitals and determine which components of the 2016 Infectious Diseases Society of America (IDSA)/Society for Hospital Epidemiology of America (SHEA) ASP guidelines are implemented at each site.

Methods. A survey of the highest-ranking hospitals, compiled from the 2015–2016 US News and World Report's Best Hospital Rankings, was conducted from August to December 2016. This corresponded to 138 adult and 62 pediatric unique hospitals. We inquired as to which components of the 2016 IDSA/SHEA ASP guidelines were implemented at each site. Appropriate persons at each hospital were emailed surveys after telephone or email conversations confirmed that they belonged to that hospital's ASP.

Results. Overall, 101 of 200 hospitals responded (51%). Of these, 82% (n = 83/101) had an active ASP, and 59% (n = 47/80) were active for more than 5 years. Most report to a committee rather than to an individual (n = 68/80, 85%), do not have their own

Which of the following strategies (if any) does your ASP use to educate clinicians regarding resistance and optimal prescribing habits? (n = 69)			
pitals fol administ	Didactic lectures/presentations	61	88
	Web-based educational resources	30	43
Concl commitn	Education pamphlets	13	19
	Posters/flyers	13	19
hospitals	Reviewing de-identified cases with providers	8	12
	Other	8	12
Keywo	None	1	1

Utilizing Online-Learning for AS Education

J Antimicrob Chemother 2015; **70**: 3175–3177
doi:10.1093/jac/dkv336 Advance Access publication 1 October 2015

**Journal of
Antimicrobial
Chemotherapy**

Educating healthcare professionals in antimicrobial stewardship: can online-learning solutions help?

Nuno Rocha-Pereira¹, Natalie Lafferty² and Dilip Nathwani^{3*}

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*Corresponding author. Tel: +44-1382-660111; Fax: +44-1382-385432; E-mail: dilip.nathwani@nhs.net

Education is widely recognized as one of the cornerstones of successful antimicrobial stewardship programmes. There is evidence of important knowledge flaws around antimicrobial prescribing among both medical students and clinicians. Educational interventions improve antimicrobial prescribing, but traditional tools may be insufficient to deliver training to meet the complex demands of global healthcare professionals working across a diverse range of healthcare and resource settings. The educational solutions increasingly need to be timely, efficient, pragmatic, high quality, aligned to the needs of the professional in a specific context, sustainable and cost-effective. Online learning has been playing a growing role in education about antimicrobial stewardship and the recent phenomenon of massive open online courses (MOOCs) offers novel and additional opportunities to deliver relevant information to a wide range of people. Additional research on MOOCs as an educational approach is needed in order to define their effectiveness, sustainability and the best ways to achieve the intended results. Although the precise value of new online strategies such as MOOCs is ill defined, they certainly will have an important place in increasing awareness and improving antimicrobial prescribing.

Advantages and Disadvantages of E-learning

Advantages

- Wide availability
- Reduced costs of delivery
- Flexibility of schedules
- Portability of content
- Access to experts and curricula otherwise inaccessible
- Self-paced
- Potential to learn in teams that may replicate the workplace

Disadvantages

- Laborious preparation of educational content
- More time-consuming for students
- Lack of student-teacher interaction
- Possibility of isolation
- Inability to clarify doubts properly
- Lack of in-depth group discussion
- Difficulty of delivering some content without human interaction

Fairview AS Education Plan

What?

- Mandatory antimicrobial stewardship education

Who?

- Non-provider staff
- Providers
- Pharmacists

How?

- Electronic Learning Management System (LMS)

When?

- Spring 2018
- Content reviewed and assigned annually



LMS Development and Deployment

- Content developed by Subject Matter Experts
- Content submitted to LMS Technologist
- Module assigned to staff
 - Non-provider staff
 - Providers
 - Pharmacists

Tracking Compliance

- Staff receive email notifications for lessons that are due
- Managers receive email notifications with a list of their due and overdue staff
- All learning completion is recorded on the employee's LMS transcript

AS EDUCATION CONTENT

Fairview LMS System



Search | Enter search term...



Home Skills Favorites eLearning Discussion Classes & Events Surveyor Tools

My Activities Overview

Click to view:

Transcript

Credits Earned

OnTrack

Quick Links

Self-Enroll: eLearning

Self-Enroll: Classes & Events

Home

https://contentplayer.elsevierperformancemanager.com/Default.aspx?lessonID=261423&virtualName=M - Internet ...



2019 Mandatory Antimicrobial Stewardship Education for Pharmacists - ALL

COURSE OBJECTIVES:

1. Explain what antimicrobial stewardship is and why it is important
2. Describe Fairview system and site efforts surrounding antimicrobial stewardship
3. Identify system and site antimicrobial stewardship leaders
4. Identify resources available to pharmacists to assist with antimicrobial stewardship activities

LENGTH: The expected time to complete this entire learning module is 20 minutes. If you are unable to complete during scheduled work time, it may be completed outside of work with prior approval from your supervisor. Any overtime must be approved.

TARGET AUDIENCE: Pharmacists.

CREATED BY: Emily Medcraft.

DATE CREATED: 3/27/2019

There is a test connected to this lesson. Once you are finished, close out of the lesson, click on the title again, and the test button will be made available.

Start the Lesson

Take the Test

ELSEVIER

Elsevier Performance Manager Clinical Skills
About Support Center Resource Center NADSP
Cookies are used by this site. To decline or learn more, visit c

Pharmacist LMS Lesson Screenshot

Antimicrobial Stewardship for Pharmacists



Target Audience

This lesson is intended for pharmacists.

Contacts

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Inpatient Antimicrobial Stewardship Team

Estimated Duration and Prerequisites

The expected time to complete this lesson is 15 minutes. This lesson is intended to be completed during scheduled work hours and requires approval from your supervisor.

This material contains information that is confidential to Fairview Health Services.

Once you complete this lesson, you should be able to:

1. Explain what antimicrobial stewardship is and why it is important
2. Describe Fairview system and site specific antimicrobial stewardship
3. Identify system and site antimicrobial stewardship resources
4. Identify resources available to pharmacists for antimicrobial stewardship activities

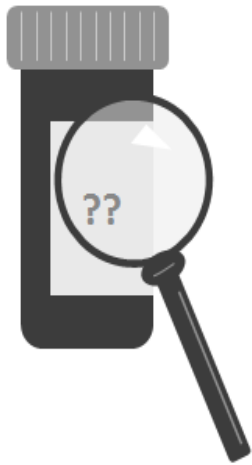
Introduction	Fairview System and Site Antimicrobial Stewardship Teams	Antimicrobial Formulary Restrictions and Disease State Guidelines	Antimicrobial Stewardship Roles	Antimicrobial Stewardship Resources
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Standard Education Content

- Defined Antimicrobial Stewardship
- Highlighted the need for Antimicrobial Stewardship and why it is important
- Goal was to be consistent with content
 - Followed the CDC 7 core elements
- Explained everyone has a role to play
- Clearly stated the role of the Antimicrobial Stewardship Team
- “*What can you do*” slide

What is Antimicrobial Stewardship?



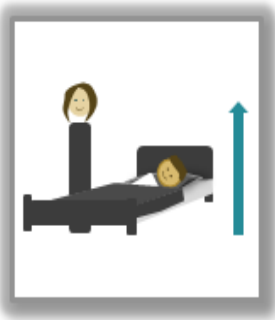
Antibiotic stewardship programs and interventions help ensure that patients receive antibiotics only when absolutely necessary; and when they are needed, the correct antibiotic is prescribed in a timely manner at the right dose and duration.

New regulatory requirements from CMS and the Joint Commission require antimicrobial stewardship programs be in place by the end of 2017 with a goal of 100% compliance from all hospitals and critical access hospitals by 2020.

Antimicrobial Stewardship is a coordinated program that:

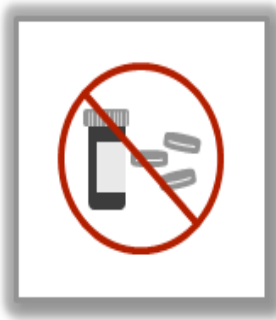
- ✔ promotes the appropriate use of antimicrobials
- ✔ improves patient outcomes
- ✔ reduces antimicrobial resistance
- ✔ decreases the spread of infections caused by multidrug-resistant organisms

Importance of Antimicrobial Stewardship



Improve the quality of patient care and patient safety

- Increase infection cure rates
- Reduce treatment failures
- Reduce adverse events associated with antimicrobial therapy



Reduce use of inappropriate antimicrobials

- 20-50% of all antibiotics prescribed in acute care hospitals are either inappropriate or unnecessary



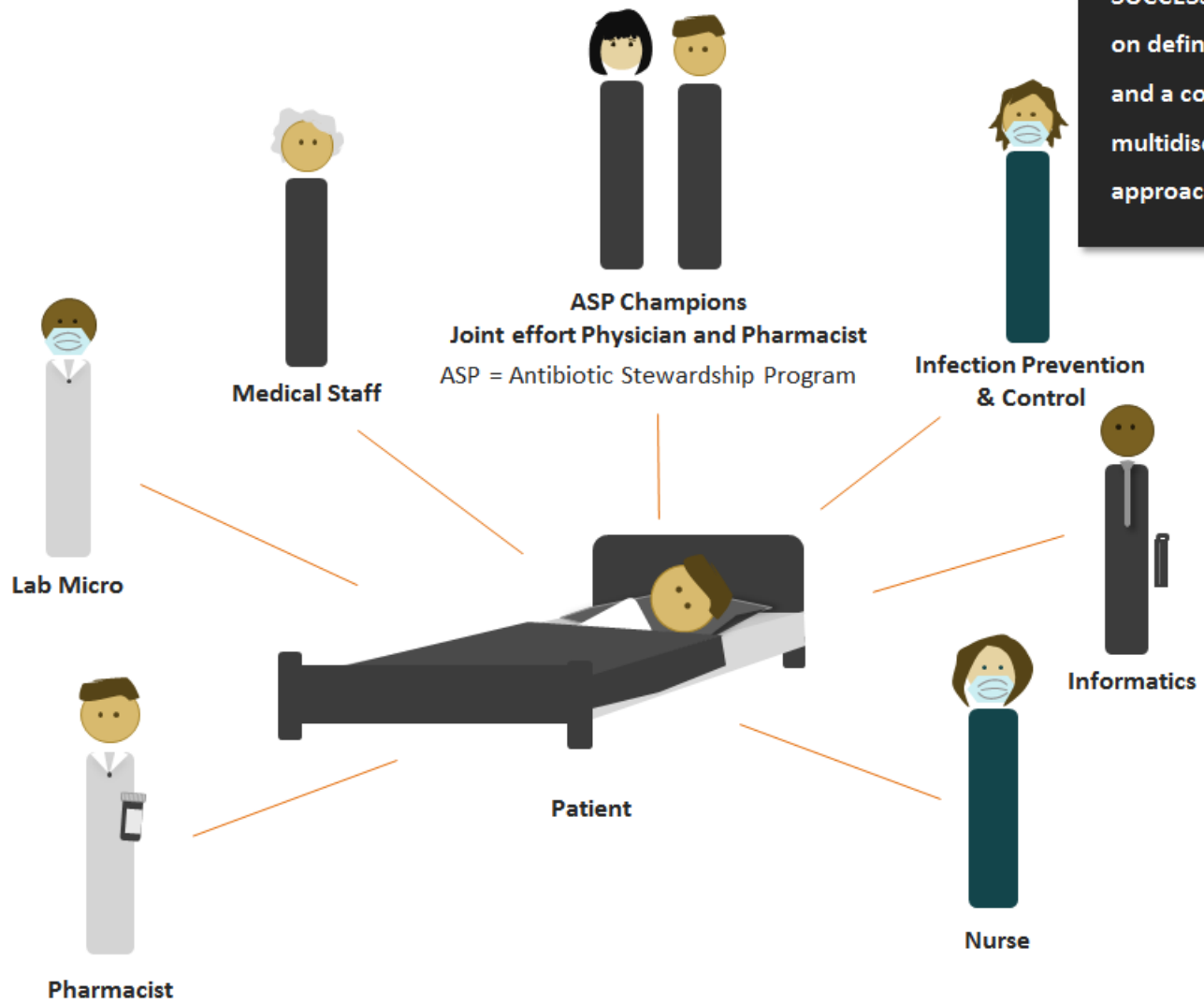
Prevent collateral damage

- e.g. Clostridium difficile infection



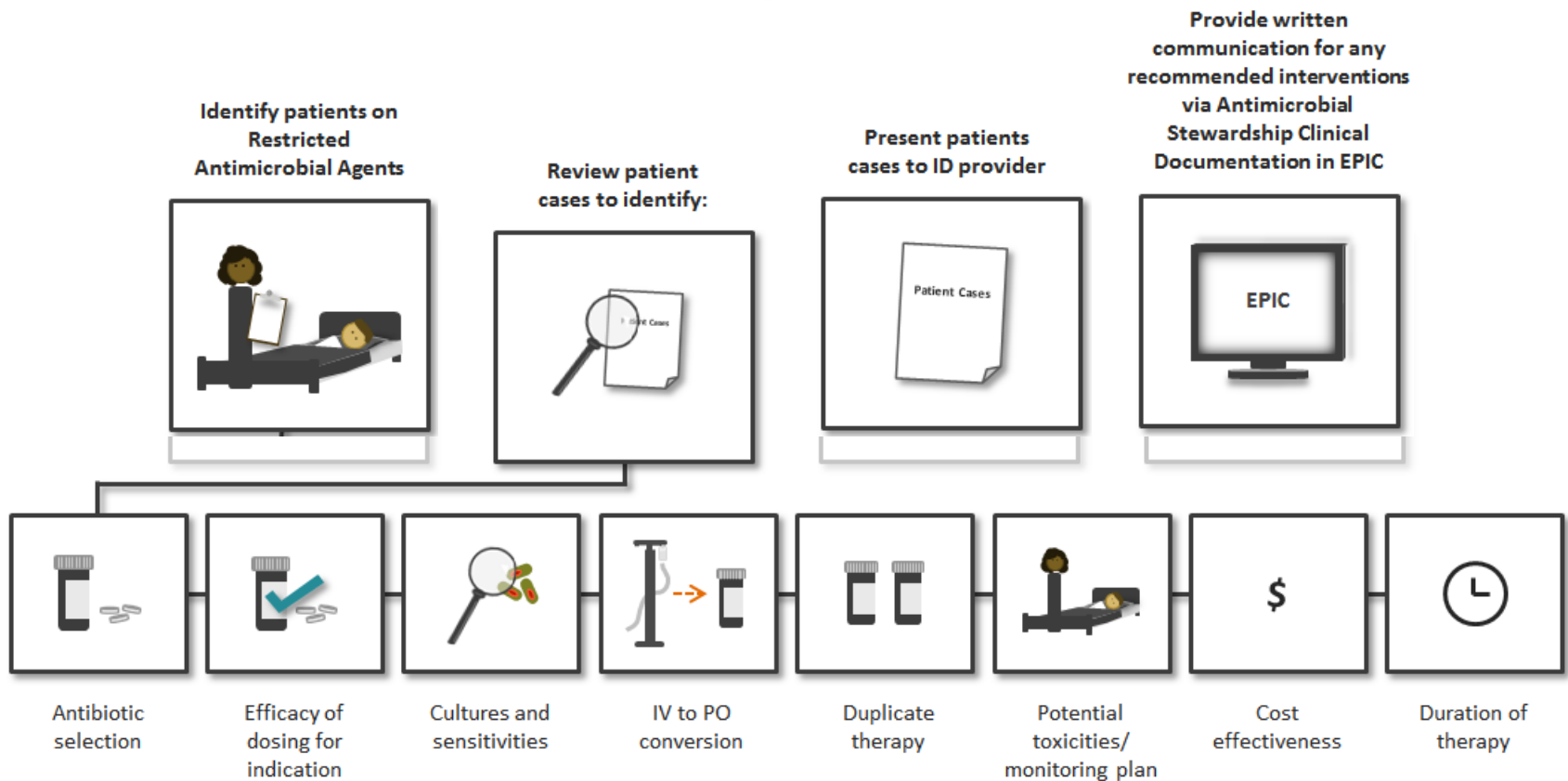
Decrease antimicrobial resistance

Team Based Approach to Antibiotic Stewardship



SUCCESS is dependent on defined leadership and a coordinated multidisciplinary approach.

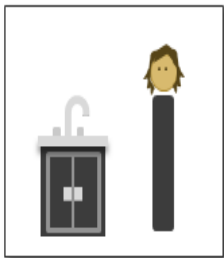
Role of Antimicrobial Stewardship Pharmacist



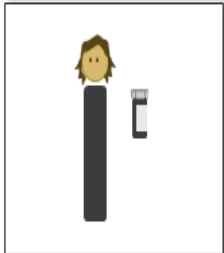
Focused Education Content: Non-Provider

- Included all standard education content
- Kept this pretty basic
- Added a “what you can do”
- Included the CDC patient education resource
- How to access AS intranet resources

What You Can Do...

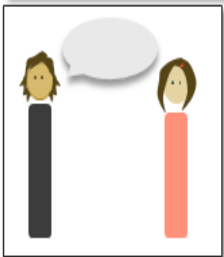


Practice good hand hygiene



Promote Antibiotic Best Practices

- Ensure all orders have a dose, duration, and indication
- Access restricted antimicrobial guidelines
- Get cultures before starting antibiotics
- Reassessing antibiotics after 48-72 hours
- Define a duration for antibiotic therapy



Help patients understand the "appropriate use" for antibiotics

Viruses or Bacteria

What's got you sick?

Antibiotics only treat bacterial infections. Viral illnesses cannot be treated with antibiotics. When an antibiotic is not prescribed, ask your healthcare professional for tips on how to relieve symptoms and feel better.

Common Condition: What's got you sick?	Common Cause			Are antibiotics needed?
	Bacteria	Bacteria or Virus	Virus	
Strep throat	✓			Yes
Whooping cough	✓			Yes
Urinary tract infection	✓			Yes
Sinus infection		✓		Maybe
Middle ear infection		✓		Maybe
Bronchitis/chest cold (in otherwise healthy children and adults)*		✓		No
Common cold/runny nose			✓	No
Sore throat (except strep)			✓	No
Flu			✓	No
Asthma			✓	No

Antibiotics Aren't Always the Answer

GET SMART
Know When Antibiotics Work

www.cdc.gov/getsmart

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

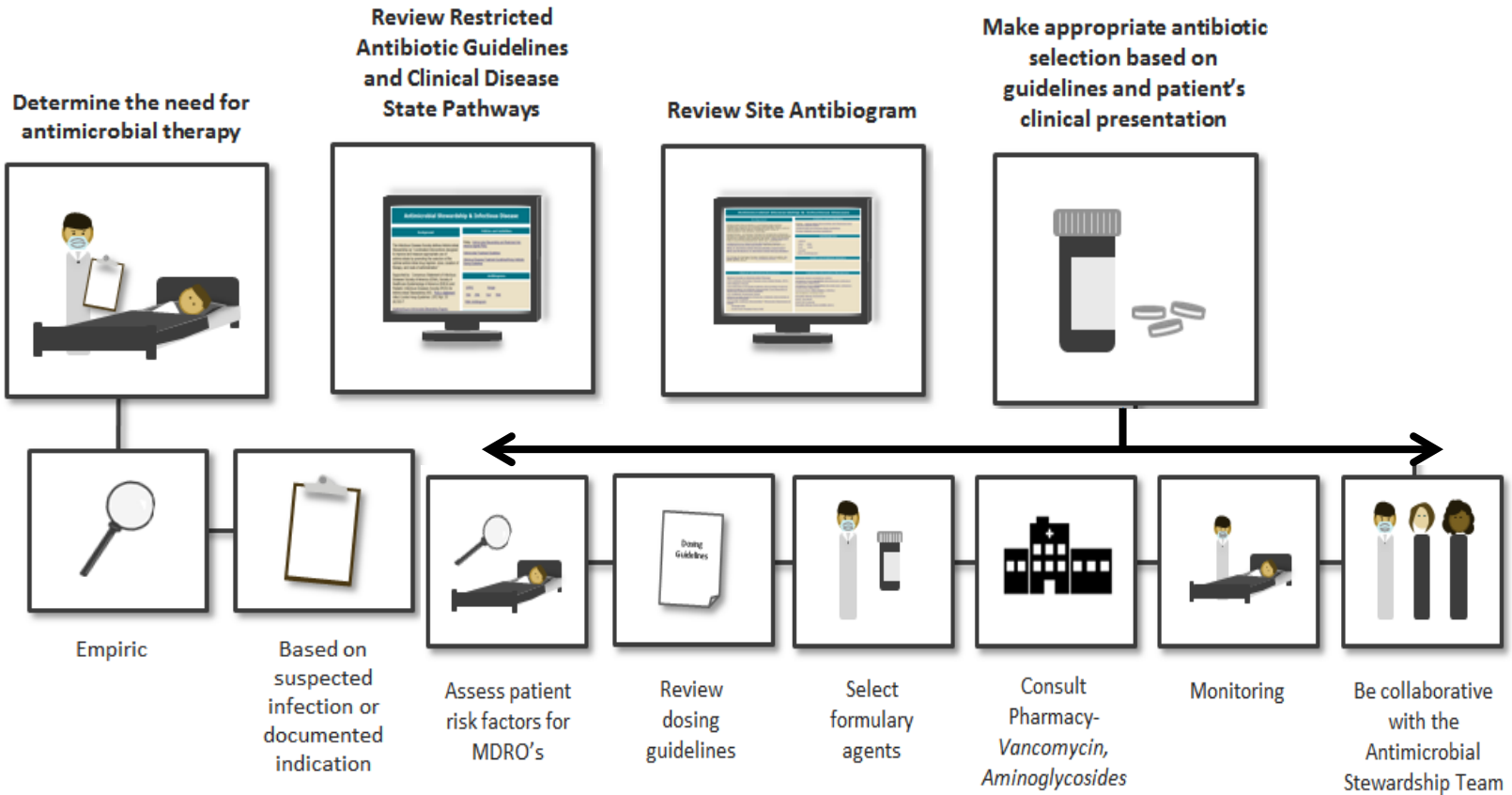
Nov. 16, 2017
CS272798



Focused Education Content: Providers

- Defined the role of the primary provider
- Highlighted key resources for provider use
 - Antibigrams
 - Required indications
 - Restricted antimicrobial guidelines
 - Formulary selection
 - Pharmacy consults
- Encouraged collaboration with the Antimicrobial Stewardship Teams

Role of Primary Provider



Physician Dashboard

Epic
Hyperspace - UU PHYS STANDARD - Fairview SUP cp PROD - 2 Results

Epic Dragon Login Personalize Bugs and Drugs Home Chart Encounter Patient Station Telephone Call Today's Pts Appts **Dashboard**

IP Phys Standard References

What's New in Reporting

IP Phys Standard References

UpToDate with CME

Search UpToDate

Paging Links

Amcom Paging
American Messaging
Amion

Medical References

▼ Clinical References

Calculator
MD Calc
Pregnancy Wheel
PubMed
FV Medical Library
FP Notebook (Dr. Moses)
Number Needed to Treat website

▼ Medication References

Infectious Disease

Antibiogram by site
MDH Weekly Influenza Activity
Fairview Measles Readiness, May 2017
MDH Measles, May 2017
CDC Ebola Page, Jun 2017
Restricted Antibiotics and Treatment Guidelines
Fairview Isolation Grid
Blood Culture Guidelines
Blood culture algorithm Gram Negative
Blood culture algorithm Gram Positive

Sepsis

Sepsis Detection protocol
Sepsis Treatment Provider Instructions

Required Indications for Antimicrobials

piperacillin-tazobactam (ZOSYN) intermittent infusion 4.5 g ✓ Accept ✗ Canc

Report: **Lab Test Results**

Component	Time Elapsed	Value	Range	Status	Comments
Creatinine	1 day (11/01/17 0715)	1.07	0.66 - 1.25 mg/dL	Final result	
	1 day (10/31/17 1947)	1.00	0.66 - 1.25 mg/dL	Final result	
	236 days (03/10/17 1445)	1.07	0.66 - 1.25 mg/dL	Final result	

Reference Links: 1. MedInfo 2. Provider Resource Link 3. Peds Renal Dosing
4. Infectious Diseases Practice Guidelines

Dose: 4.5 g

Administer Dose: 4.5 g
Administer Amount: 100 mL

Route:

Frequency:

For: Doses Hours Days

Starting: 11/2/2017 At: 1400

First Dose: **Today 1400**

Scheduled Times:
11/2/17 1400, 2000
11/3/17 0200, 0800, 1400, 2000
11/4/17 0200, 0800, 1400, 2000

Order has no end date or number of doses, so more times will be scheduled at a later date.

Priority:

Indications:

- Abscess
- Aspiration Pneumonia
- Bacteremia
- Bone and/or Joint Infection
- Clostridium difficile
- Community Acquired Pneumonia
- Endocarditis
- Febrile Neutropenia
- Healthcare-Associated Pneumonia
- Intra-Abdominal Infection
- Meningitis
- Osteomyelitis
- Perioperative Pharmacoprophylaxis
- Possible post-op infection
- Postoperative Infection
- Pyelonephritis
- Sepsis
- Skin and Soft Tissue Infection
- Urinary Tract Infection
- Ventilator-Associated Pneumonia

Indications (Free Text):

- Required indications meets one of the CDC's core elements of antimicrobial stewardship.
- The provider must select the indication for the antimicrobial on ordering in EPIC which can assist with clinical evaluation of the order.

Anti-infective Guideline link in Epic

meropenem (MERREM) in NaCl 0.9 % 100 mL intermittent infusion ✓ Accept

Report: **Lab Test Results**

Component	Time Elapsed	Value	Range	Status	Comments
Creatinine	23 hours (07/09/17 0858)	0.86	0.66 - 1.25 mg/dL	Final result	
	1 day (07/08/17 1550)	0.77	0.66 - 1.25 mg/dL	Final result	
	6 days (07/03/17 0925)	0.70	0.66 - 1.25 mg/dL	Final result	

Reference Links: [1. Adult Renal Dosing](#) [2. Provider Resource Link](#) [3. MedInfo](#)
[4. Peds Renal Dosing](#) [5. Meropenem Use Guideline](#)

Dose: 500 mg 1 g 2 g

Route: Intravenous

Frequency: EVERY 6 HOURS Q6H Q8H Q12H Q24H

For: Doses Hours Days

Starting: 7/10/2017 Today Tomorrow At: 0845 [Show Additional Options](#)

First Dose: **Today 0845** **Until Discontinued**

Scheduled Times: [Hide Schedule](#)

7/10/17 0845, 1445, 2045
7/11/17 0245, 0845, 1445, 2045
7/12/17 0245, 0845, 1445, 2045

Order has no end date or number of doses, so more times will be scheduled at a later date.

Priority: Routine Routine ASAP STAT

Antimicrobial Use Guideline Hyperlink in EPIC Medication Order

Available Disease State Guidelines

- *C difficile* (update pending 2019)
- Candidemia
- Invasive Aspergillosis
- Blood Stream Infections
- Pneumonia
- Diabetic Foot Infections
- UTI/Asymptomatic Bacteriuria
- RSV Treatment Guidelines

Example Disease State Guideline

Fairview M Health Inpatient Services Adult and Pediatric *Clostridium difficile* Infection Guidelines

Purpose

To help guide diagnosis, treatment and prevention of *C. difficile* infection (CDI) in patients at Fairview M Health Services.

Definitions

- ***C. difficile* Infection:** positive *C. difficile* PCR ***PLUS*** any of the following:
 - ≥ 3 unformed stools in < 24 hours without alternate explanation (i.e. tube feeds, laxative use)
 - Colonoscopic or histopathologic evidence of pseudomembranous formation
- **Non-Severe Disease**
 - CDI ***PLUS*** any of the following:
 - WBC $< 15,000$ cells/mm³ or unchanged
 - SCr ≤ 1.5 mg/dL
- **Severe Disease**
 - CDI ***PLUS*** any of the following:
 - WBC $\geq 15,000$ cells/mm³
 - SCr > 1.5 mg/dL
 - Albumin < 2.5 g/L
- **Fulminant Disease**
 - Same criteria as severe ***PLUS*** any of the following attributed to CDI:
 - Hypotension (SBP < 60 mmHg) or shock
 - ICU admission
 - Significant abdominal distension
 - Altered mental status
 - WBC $\geq 25,000$ cells/mm³
 - Serum lactate > 2.2 mmol/L
 - Evidence of megacolon, ileus, colonic perforation, or severe colitis on imaging
- **Recurrence:** recurrent symptoms and positive testing for toxigenic *C. difficile* within 8 weeks of prior episode
- **Relapse:** recurrent symptoms with the same strain of *C. difficile* 3 weeks of prior episode

Focused Education Content: Pharmacists

- Included organizational charts of the ASP teams for each site
- Defined the role of every pharmacist in daily antimicrobial stewardship activities
- Called out our restricted antimicrobial agents
- Highlighted key resources on our FV intranet
- Required post-test highlighting key concepts

Antimicrobial
Stewardship Roles



PRIMARY
PROVIDER

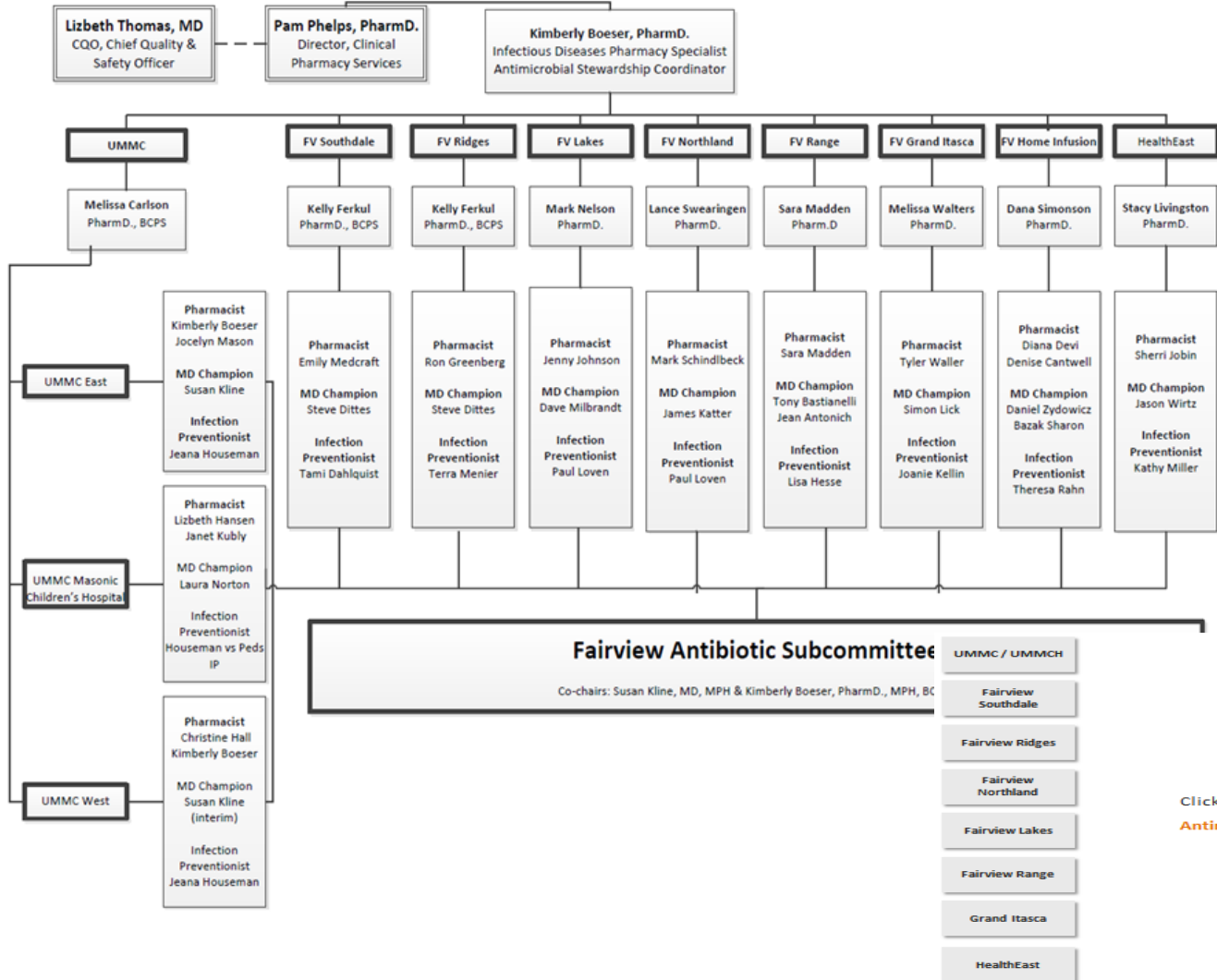


PHARMACIST



ANTIMICROBIAL
STEWARDSHIP
PHARMACIST

Fairview Health Services Antimicrobial Stewardship



Click on your site and view your site's Antimicrobial Stewardship Team.

Core Elements of Antimicrobial Review for all Pharmacists

Review patient cases daily to assess:



Antibiotic selection



Efficacy of dosing for indication



Renal dose adjustments



Cultures and sensitivities



IV to PO conversion



Duplicate therapy



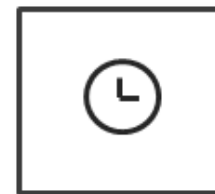
Potential toxicities and monitoring plan



Pharmacokinetic monitoring

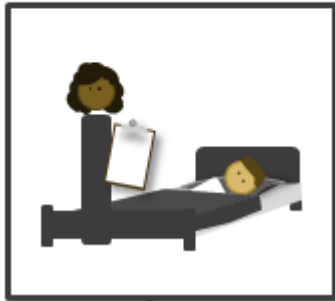


Cost effectiveness

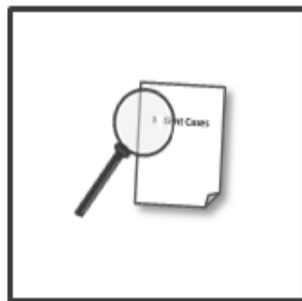


Duration of therapy

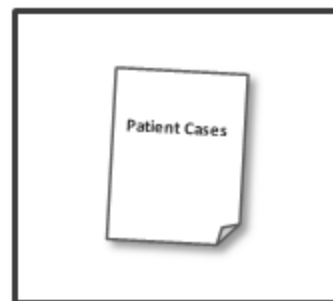
Identify patients on
Restricted
Antimicrobial Agents



Review patient
cases to identify:



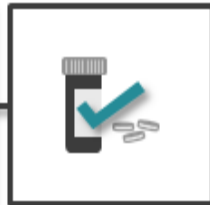
Present patients
cases to ID provider



Provide written
communication for any
recommended interventions
via Antimicrobial
Stewardship Clinical
Documentation in EPIC



Antibiotic
selection



Efficacy of
dosing for
indication



Cultures and
sensitivities



IV to PO
conversion



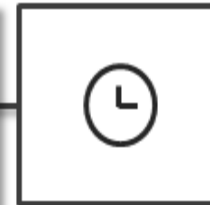
Duplicate
therapy



Potential
toxicities/
monitoring plan



Cost
effectiveness



Duration of
therapy

Restricted Antimicrobials

- Abelcet/AmBisome
- Amikacin
- Aztreonam
- Baloxavir marboxil
- Bezlotoxumab
- Caspofungin
- Cefepime
- Ceftazidime
- Ceftazidime/avibactam
- Ceftaroline
- Ceftolozane/tazobactam
- Cidofovir
- CMV IgG (Cytogam)

- Colistin/Polymyxin B
- Dalbavancin
- Daptomycin
- Doripenem
- Fidaxomicin
- Foscarnet
- Imipenem/Cilastatin
- Isavuconazonium
- Itraconazole
- Letermovir
- Linezolid
- Meropenem
- Meropenem/vaborbactam

- Micafungin
- Oritavancin
- Plazomicin
- Posaconazole
- Quinupristin/dalfopristin
- Ribavarin (*inhalation and IV*)
- Telavancin
- Tigecycline
- Vancomycin
- Voriconazole

Resources for Antimicrobial Stewardship and Infectious Diseases

The image shows a screenshot of the Fairview Pharmacy Services website. The main navigation bar includes 'About Us', 'Clinical Teams', 'Business Services', 'Resources', 'Applications', and 'Lea Deve'. The 'Resources' menu is highlighted, and a 'Resources Quick Search' box is visible. A red circle highlights 'Pharmacy Resource Center' in the search results. A red arrow points from this circle to the 'Antimicrobial Stewardship & Infectious Disease' link in the Pharmacy Services Resource Center menu. The 'Antimicrobial Stewardship & Infectious Disease' page is shown below, with a red circle around the title and another red circle around the 'Policies and Guidelines' section. The 'Antibiograms' section is also circled in red.

Pharmacy Services Resource Center

- Drug Info/Conversions/Resources
- Anticoagulation
- Antimicrobial Stewardship & Infectious Disease**
- Chemotherapy/Hazardous Handling
- Injectable Info
- Pain Management

Provider
Nurse
Pharmacy
UpToDate.

Antimicrobial Stewardship & Infectious Disease

Background

The Infectious Disease Society defines Antimicrobial Stewardship as "coordinated interventions designed to improve and measure appropriate use of antimicrobials by promoting the selection of the optimal antimicrobial drug regimen, dose, duration of therapy, and route of administration."

Supported by: Consensus Statement of Infectious Diseases Society of America (IDSA), Society of Healthcare Epidemiology of America (SHEA) and Pediatric Infectious Diseases Society (PIDS) for Antimicrobial Stewardship (AS). [Policy statement](#). Infect Control Hosp Epidemiol. 2012 Apr; 33 (4):322-7.

[Implementing an Antimicrobial Stewardship Program: Guidelines by the IDSA and SHEA](#). CID 2016;62:e51-e77.

Why is Antimicrobial Stewardship important?

Who participates in Antimicrobial Stewardship?

[AS Integration Update Nov 2018](#)

Policies and Guidelines

Policy: [Antimicrobial Stewardship and Restricted Anti-infective Agents Policy](#)

Policy: [Antimicrobial Catheter Lock Therapy](#)

[Acute Kidney Injury Risk with Concomitant Use of Vancomycin and Pip-Tazo](#) *new*

[Carbapenemase-Producing Carbapenem-Resistant Enterobacteriaceae \(CP-CRE\) Inpatient Management Guideline](#)

[Antimicrobial Treatment Guidelines](#)

[IDDL Susceptibility Testing on Normal Flora](#)

[Infectious Diseases Treatment Guidelines](#)

[Periop Antibiotic Dosing Guidelines](#)

Antibiograms

UMMC UMMCH Range GICH
FSH FRH FLH FNH HE
MDH Antibiogram Ebenezer

POST-IMPLEMENTATION



Challenges

- Standardizing our system education in the midst of health system integration
- Prioritizing as mandatory
- Content selection
- Setting expectations for ALL staff
- Ensuring deployment
- Annual evaluation of content



Next Steps

- Re-evaluation of content
 - Target areas of impact
- Clinical System Administrator for the Learning Management System (LMS) recommends pre-test
 - Pretests are passed with a score of 100%, anything less than 100%, the staff will be required to review the module and pass the posttest*
- Evaluating impact of education
- Continued integration of our health system policies and education

Take Aways

- Limited literature to support optimal AS education practices
- Online learning format offers many advantages but some obstacles
- Highlight access to resources
- Consistency is key

Questions



References

- CDC, Antibiotic Resistance Threats in the United States (2013). <https://www.cdc.gov/drugresistance/pdf/ar-threats-2013-508.pdf> [Accessed 12/16/16]
- CDC, Core elements of hospital antibiotic stewardship programs (2015)
<https://www.cdc.gov/antibiotic-use/healthcare/implementation/core-elements.html>
[Accessed 5/2019]
- Joint Commission, New Antimicrobial Stewardship Standard (2016).
https://www.jointcommission.org/assets/1/6/New_Antimicrobial_Stewardship_Standard.pdf [Accessed 5/2019]
- Nhan et al. Structure of Antimicrobial Stewardship Programs in Leading US Hospitals: Findings of Nationwide Survey. OFID. 2019
- Rocha-Pereira et al. Educating healthcare professionals in antimicrobial stewardship: can online learning solutions help? J Antimicrob Chemother. 2015; 70:3175-3177
- Barlam TF, Cosgrove SE, et al. Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Disease Society of America and the Society for Healthcare Epidemiology of America. Clin Infect Dis. 2016.
- CDC (2017). Viruses or Bacteria-What's Got You Sick? <https://www.cdc.gov/antibiotic-use/community/pdfs/Viruses-or-Bacteria-Factsheet-Eng.pdf> [Accessed 11/2017]
- CDC, Hand Hygiene in Healthcare Settings (2016). <https://www.cdc.gov/handhygiene/> [Accessed 12/16/16]

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