

Building a Joint Commission Ready Antimicrobial Stewardship Program

Florian Daragjati, Pharm.D, BCPS

Antimicrobial Stewardship Coordinator

Ascension Center of Excellence for Antimicrobial Stewardship and
Infection Prevention

Disclosures

- I have no financial conflict of interest to report

Outline

- Understand the 2020 goals, which are part of the national strategy for combating antimicrobial resistant organisms
- Understand and be able to describe the elements of performance for Joint Commission Standard MM 09.01.01
- Understand the importance of engaging stakeholders within the organization to improve antimicrobial prescribing
- Discuss the role of testing stewardship as an important component of antimicrobial stewardship

Estimating National Trends in Inpatient Antibiotic Use Among US Hospitals From 2006 to 2012

James Baggs, PhD; Scott K. Fridkin, MD, MPH; Lori A. Pollack, MD, MPH; Arjun Srinivasan, MD, MPH;
John A. Jernigan, MD, MS

- 55.1% of patients discharged received at least 1 dose of an antibiotic during visit
- Non-teaching hospitals had higher use compared to teaching hospitals
- Increases in use
 - Vancomycin- 20%
 - Carbapenems- 37%
 - 3rd/4th Gen Cephalosporins- 12%
 - B-lactam/β-lactamase inhibitors- 26%
- Decreases in use
 - Quinolones- 20%
 - 1st/2nd Gen Cephalosporins- 7%

Table 3. Extrapolated Estimates of Antibiotic Usage in the Truven MarketScan Hospital Drug Database by Year and Various Characteristics, 2006-2012

Characteristic	DOT/1000 PDs							
	2006	2007	2008	2009	2010	2011	2012	All Years
Antibiotic class								
All	732.5	736.9	755.6	766.8	755.4	770.0	767.5	754.8
Aminoglycosides	30.7	29.2	27.6	25.4	23.3	20.9	19.8	25.3
First- and second-generation cephalosporins	96.8	93.0	90.5	90.0	87.9	85.8	83.1	89.6
Third- and fourth-generation Cephalosporins	90.2	88.1	89.2	93.1	96.7	103.7	105.6	95.2
Lincosamide	23.1	22.9	22.3	21.6	20.4	20.2	19.8	21.5
Fluoroquinolones	143.7	141.0	139.4	134.3	126.6	123.0	117.0	132.3
Macrolides	35.2	34.2	36.9	38.7	37.6	42.0	42.1	38.1
Glycopeptide	72.0	77.1	85.0	91.7	93.6	100.1	103.4	88.8
Sulfa	15.4	16.0	16.5	16.0	15.4	14.5	13.8	15.4
β-Lactam/β-lactamase inhibitor combinations	75.5	80.5	88.0	93.4	94.5	99.1	102.6	90.4
Carbapenems	22.2	23.8	27.0	29.8	29.6	31.6	32.3	28.0
Penicillins	35.8	34.6	33.0	32.0	30.8	29.1	29.0	32.1
Tetracyclines	8.5	10.1	12.3	14.8	13.7	13.5	13.2	12.3
Metronidazole	53.7	53.1	52.4	51.0	50.0	49.7	49.3	51.3
Other	29.8	33.0	35.4	35.1	35.3	36.8	36.7	34.6

Prevalence of Antimicrobial Use

Table 2. Infection Sites for Which Patients Received Antimicrobial Treatment

Infection Site ^a	No. of Drugs, (%) [95% CI] (n = 7641)	No. of Patients, (%) [95% CI] (n = 4278)
Lower respiratory tract	2607 (34.1) [33.1-35.2]	1480 (34.6) [33.2-36.0]
Urinary tract	1302 (17.0) [16.2-17.9]	955 (22.3) [21.1-23.6]
Skin and soft tissue	1177 (15.4) [14.6-16.2]	688 (16.1) [15.0-17.2]
Gastrointestinal tract	829 (10.8) [10.2-11.6]	537 (12.6) [11.6-13.6]
Undetermined/empirical	661 (8.7) [8.0-9.3]	364 (8.5) [7.7-9.4]
Bloodstream	639 (8.4) [7.8-9.0]	401 (9.4) [8.5-10.3]
Intra-abdominal	317 (4.1) [3.7-4.6]	178 (4.2) [3.6-4.8]
Bone and joint	291 (3.8) [3.4-4.3]	185 (4.3) [3.7-5.0]
Ear, nose, and throat	237 (3.1) [2.7-3.5]	183 (4.3) [3.7-4.9]
Hepatobiliary system	183 (2.4) [2.1-2.8]	109 (2.5) [2.1-3.1]
Central nervous system	137 (1.8) [1.5-2.1]	76 (1.8) [1.4-2.2]
Cardiovascular system	82 (1.1) [0.9-1.3]	50 (1.2) [0.9-1.5]
Reproductive tract	80 (1.0) [0.8-1.3]	46 (1.1) [0.8-1.4]
Disseminated	47 (0.6) [0.5-0.8]	38 (0.9) [0.6-1.2]
Unknown	34 (0.4) [0.3-0.6]	27 (0.6) [0.4-0.9]
Other	5 (0.07) [0.02-0.15]	3 (0.07) [0.02-0.19]

Prevalence of Antimicrobial Use

Table 3. Five Most Common Antimicrobial Drugs Given to Treat Community-Onset Infections and Health Care Facility-Onset Infections^a

Rank	No. of Drugs, (%) [95% CI]	
	Community-Onset Infections ^b (n = 5274)	Health Care Facility-Onset Infections ^c (n = 2220)
1	Vancomycin: 723 (13.7) [12.8-14.7] ^d	Vancomycin: 354 (15.9) [14.5-17.5] ^d
2	Ceftriaxone: 671 (12.7) [11.8-13.6]	Piperacillin-tazobactam: 259 (11.7) [10.4-13.1]
3	Levofloxacin: 518 (9.8) [9.0-10.7]	Levofloxacin: 170 (7.7) [6.6-8.8]
4	Piperacillin-tazobactam: 516 (9.8) [9.0-10.6]	Ceftriaxone: 147 (6.6) [5.6-7.7]
5	Azithromycin: 342 (6.5) [5.8-7.2]	Metronidazole: 101 (4.5) [3.7-5.5] ^d

Prevalence of *S. aureus* and Anti-MRSA Use

- Large multicenter study of 2259 adults admitted with CAP
- 1.6% had *S. aureus* identified
 - 0.7% with MRSA
- Anti-MRSA coverage in ~30% of patients

Table 5. Use of Anti-Methicillin-Resistant *Staphylococcus aureus* Antibiotics (Vancomycin or Linezolid) Within 3 Days of Hospital Presentation, by Etiology Group

Etiology Group	Patients, n	Anti-MRSA Antibiotics, n (row %)
All community-acquired pneumonia	2259	674 (29.8)
<i>Staphylococcus aureus</i>	37	34 (91.9)
MRSA	15	14 (93.3)
MSSA	22	20 (90.9)
All-cause non- <i>Staphylococcus aureus</i>	2222	640 (28.8)
Pneumococcal	115	54 (47.0)

Abbreviations: MRSA, methicillin-resistant *Staphylococcus aureus*; MSSA, methicillin-susceptible *Staphylococcus aureus*.

National Strategy for Combating Antibiotic Resistant Bacteria: 2020 Goals

- All states will implement stewardship activities in healthcare settings.
- All federal facilities will have robust stewardship programs
- 95% of hospitals will report antibiotic use data to NHSN
- Reduce inappropriate antibiotic use for monitored conditions/agents by:
 - 20% inpatient
 - 50% outpatient
- CDC and AHRQ will expand research

Nationwide Efforts to Curb Antimicrobial Resistance

- September 18, 2014 - President's Council of Advisors on Science and Technology (PCAST) Report on Combating Antibiotic Resistance
- September 18, 2014 - Executive Order 13676
 - Federal agencies to implement recommendations from PCAST Report
 - National Strategy for Combating Antibiotic Resistant Bacteria
 - Creation of interagency Task Force on Combating Antibiotic-Resistant Bacteria
- March 2015 – National Action Plan (NAP) for Combating Antibiotic Resistant Bacteria
- September 2015 – Secretary of HHS established a President's Advisory Council on Combating Antibiotic Resistant Bacteria
- November 2015 – Task Force submitted to President through Secretary HHS the First 180 Days Progress Report on implementation NAP
- March 2016 – Presidential Advisory Council submitted Initial Assessment of NAP to President through Secretary HHS

Antimicrobial Stewardship: What's Coming

- Centers for Medicare and Medicaid Services
 - July 2015: Revised Conditions of Participation (CoP) that will require antibiotic stewardship aligned with CDC core elements in nursing homes, also exploring for inpatient settings
 - New infection control standards will require antibiotic stewardship programs (ASP) in long-term care facilities (LTCFs)
- CDC – Core Elements ASP programs in hospitals and nursing homes
- CDC - Development of Antimicrobial Use Measure
 - Risk-adjusted summary measure of antimicrobial use in hospitals
 - Benchmark for hospitals and health systems
 - Endorsed by National Quality Forum January 2016
- The Joint Commission
 - Development of an antibiotic stewardship standard requiring stewardship across all health care settings
 - Standard in effect as of January 2017

<http://www.hhs.gov/ash/carb/march3031meeting/paccarb-draft-report1-march-2016.pdf>

Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria. Initial Assessments of the National Action Plan for Combating Antibiotic-Resistant Bacteria. March 2016.

IDSA Choosing Wisely Campaign

1

Don't treat asymptomatic bacteruria with antibiotics.

Inappropriate use of antibiotics to treat asymptomatic bacteruria (ASB), or a significant number of bacteria in the urine that occurs without symptoms such as burning or frequent urination, is a major contributor to antibiotic overuse in patients. With the exception of pregnant patients, patients undergoing prostate surgery or other invasive urological surgery, and kidney or kidney pancreas organ transplant patients within the first year of receiving the transplant, use of antibiotics to treat ASB is not clinically beneficial and does not improve morbidity or mortality. The presence of a urinary catheter increases the risk of bacteruria, however, antibiotic use does not decrease the incidence of symptomatic catheter-associated urinary tract infection (CAUTI), and unless there are symptoms referable to the urinary tract or symptoms with no identifiable cause, catheter-associated asymptomatic bacteruria (CA-ASB) does not require screening and antibiotic therapy. The overtreatment of ASB with antibiotics is not only costly, but can lead to *C. difficile* infection and the emergence of resistant pathogens, raising issues of patient safety and quality.

2

Avoid prescribing antibiotics for upper respiratory infections.

The majority of acute upper respiratory infections (URIs) are viral in etiology and the use of antibiotic treatment is ineffective, inappropriate and potentially harmful. However, proven infection by Group A Streptococcal disease (Strep throat) and pertussis (whooping cough) should be treated with antibiotic therapy. Symptomatic treatment for URIs should be directed to maximize relief of the most prominent symptom(s). It is important that health care providers have a dialogue with their patients and provide education about the consequences of misusing antibiotics in viral infections, which may lead to increased costs, antimicrobial resistance and adverse effects.

3

Don't use antibiotic therapy for stasis dermatitis of lower extremities.

Stasis dermatitis is commonly treated with antibiotic therapy, which may be a result of misdiagnosis or lack of awareness of the pathophysiology of the disease. The standard of care for the treatment of stasis dermatitis affecting lower extremities is a combination of leg elevation and compression. Elevation of the affected area accelerates improvements by promoting gravity drainage of edema and inflammatory substances. The routine use of oral antibiotics does not improve healing rates and may result in unnecessary hospitalization, increased health care costs and potential for patient harm.

4

Avoid testing for a *Clostridium difficile* infection in the absence of diarrhea.

Testing for *C. difficile* or its toxins should be performed only on diarrheal (unformed) stool, unless ileus due to *C. difficile* is suspected. Because *C. difficile* carriage is increased in patients on antimicrobial therapy, and patients in the hospital, only diarrheal stools warrant testing. In the absence of diarrhea, the presence of *C. difficile* indicates carriage and should not be treated and therefore, not tested.

New Antimicrobial Stewardship Standard

APPLICABLE TO HOSPITALS AND CRITICAL ACCESS HOSPITALS

Effective January 1, 2017

Medication Management (MM)

Standard MM.09.01.01

The [critical access] hospital has an antimicrobial stewardship program based on current scientific literature.

Elements of Performance for MM.09.01.01

1. Leaders establish antimicrobial stewardship as an organizational priority. (See also LD.01.03.01, EP 5)
Note: Examples of leadership commitment to an antimicrobial stewardship program are as follows:
 - Accountability documents
 - Budget plans
 - Infection prevention plans
 - Performance improvement plans
 - Strategic plans
 - Using the electronic health record to collect antimicrobial stewardship data
2. 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.
3. The [critical access] hospital educates patients, and their families as needed, regarding the appropriate use of antimicrobial medications, including antibiotics. (For more information on patient education, refer to Standard PC.02.03.01)

Note: An example of an educational tool that can be used for patients and families includes the Centers for Disease Control and Prevention's Get Smart document, "Viruses or Bacteria—What's got you sick?" at <http://www.cdc.gov/getsmart/community/downloads/getsmart-chart.pdf>.

4. The [critical access] hospital has an antimicrobial stewardship multidisciplinary team that includes the following members, when available in the setting:

- Infectious disease physician
- Infection preventionist(s)
- Pharmacist(s)
- Practitioner

Note 1: Part-time or consultant staff are acceptable as members of the antimicrobial stewardship multidisciplinary team.

Note 2: Telehealth staff are acceptable as members of the antimicrobial stewardship multidisciplinary team.

5. © The [critical access] hospital's antimicrobial stewardship program includes the following core elements:
 - Leadership commitment: Dedicating necessary human, financial, and information technology resources.
 - Accountability: Appointing a single leader responsible for program outcomes. Experience with successful programs shows that a physician leader is effective.
 - Drug expertise: Appointing a single pharmacist leader responsible for working to improve antibiotic use.
 - Action: Implementing recommended actions, such as systemic evaluation of ongoing treatment need, after a set period of initial treatment (for example, "antibiotic time out" after 48 hours).
 - Tracking: Monitoring the antimicrobial stewardship program, which may include information on antibiotic prescribing and resistance patterns.

Key: A indicates scoring category A; C indicates scoring category C; © indicates that documentation is required; ⓘ indicates Measure of Success is needed; ⚠ indicates an Immediate Threat to Health or Safety; ⚡ indicates situational decision rules apply; ⚡ indicates direct impact requirements apply; ⚡ indicates and identified risk area

Summary of Core Elements of Hospital Antibiotic Stewardship Programs

Meets MM 09.1.01 EP 5
requirements

- **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.

CDC Core Element 1: Leadership Commitment

- Facility provides visible, written statement of support for the ASP
 - Policy preferred
 - Newsletter
- Facility leadership should provide financial support and time for training and education on AS
 - Adequate staffing (FTEs), clear communication strategy
 - Specific salary support for physician and pharmacist
- Executive as “champion” of ASP
- ASP included in the strategic goals of the institution
- Outcomes data shared at performance improvement committees and hospital board
- Include AS as part of ongoing required provider education programs
- Create financial incentives for units or departments to improve antibiotic use
- Regulatory requirements, public reporting, CMS penalties

Example Leadership Support Tool



Checklist for Core Elements of Hospital Antibiotic Stewardship Program

Leadership Commitment: Dedicating necessary human, financial and information technology resources
<input checked="" type="checkbox"/> Formal written statement of support (see below)
Accountability: Appointing a single leader responsible for program outcomes.
<input checked="" type="checkbox"/> Infectious Diseases physician identified as leader responsible for program outcomes: Diana Mercado, MD
Drug Expertise: Appointing a single pharmacist leader responsible for working to improve antibiotic use.
<input checked="" type="checkbox"/> Pharmacist identified as leader responsible for working to improve antibiotic use: Florian Daraglati, PharmD- Southside Calvin Tucker, PharmD- Riverside Amy Tedeschi, PharmD- Clay
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)
<input checked="" type="checkbox"/> Antimicrobial stewardship program policy and strategy
<input checked="" type="checkbox"/> Antimicrobial "time-out" or stop order built into the EMR
<input checked="" type="checkbox"/> Antimicrobial restriction policy and criteria for use
<input checked="" type="checkbox"/> Renal dosing policy
<input checked="" type="checkbox"/> Antimicrobial intravenous-to-oral conversion
<input checked="" type="checkbox"/> Antimicrobial pharmacokinetic dose optimization program
<input checked="" type="checkbox"/> Required documentation of indication for all systemic antibiotics
<input checked="" type="checkbox"/> Clinical decision support tools to make interventions
Tracking: Monitoring antibiotic prescribing and resistance patterns
<input checked="" type="checkbox"/> Defined daily doses tracked and reported for all antimicrobials
<input checked="" type="checkbox"/> Prospective monitoring and identification of appropriate use criteria for patients on daptomycin, ceftaroline, meropenem, ertapenem, fidaxomicin, linezolid, and tigecycline
Reporting: Regular reporting information on antibiotic use and resistance to doctors, nurses and relevant staff
<input checked="" type="checkbox"/> Annual antibiogram developed and provided to physicians, nurses, and pharmacists
<input checked="" type="checkbox"/> Clostridium difficile rates reported to staff
<input checked="" type="checkbox"/> Annual MIC changes for Pseudomonas aeruginosa reported to physicians, nurses, and pharmacists
Education: Educating clinicians about resistance and optimal prescribing
<input checked="" type="checkbox"/> Antimicrobial Stewardship presentation provided to pharmacists, physicians, and other healthcare professionals
<input checked="" type="checkbox"/> Annual antibiogram and empiric guide education to pharmacists, physicians, and other healthcare professionals

Leadership Support

Hospital administration and medical staff leadership at St. Vincent's Healthcare understand that their support and collaboration in the development and maintenance of antimicrobial stewardship programs is critical to the success of the program. They recognize that there is an abundance of evidence to support that ASPs increase patient safety, decrease healthcare-associated infections, and provide cost savings through higher quality care and more careful drug selection. This leadership commitment is necessary to help further advance the program's acceptance and likelihood of success.

This is a statement of the commitment from St. Vincent's Healthcare senior management to provide leadership support to the antimicrobial stewardship program. This support is personal, financial, administrative, and executive.

Ken Rothfield, MD
Chief Medical Officer, St. Vincent's Healthcare

Example document for
MM 09.01.01 EP 1

Leadership Support

Hospital administration and medical staff leadership at St. Vincent's Healthcare understand that their support and collaboration in the development and maintenance of antimicrobial stewardship programs is critical to the success of the program. They recognize that there is an abundance of evidence to support that ASPs increase patient safety, decrease healthcare-associated infections, and provide cost savings through higher quality care and more careful drug selection. This leadership commitment is necessary to help further advance the program's acceptance and likelihood of success.

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Ken Rothfield, MD
Chief Medical Officer, St. Vincent's Healthcare

Leadership Support: Hospital Compare

Medicare.gov | **Hospital Compare**

The Official U.S. Government Site for Medicare

Compare Hospitals

[Back to Results](#)

General
information

Survey of
patients'
experiences

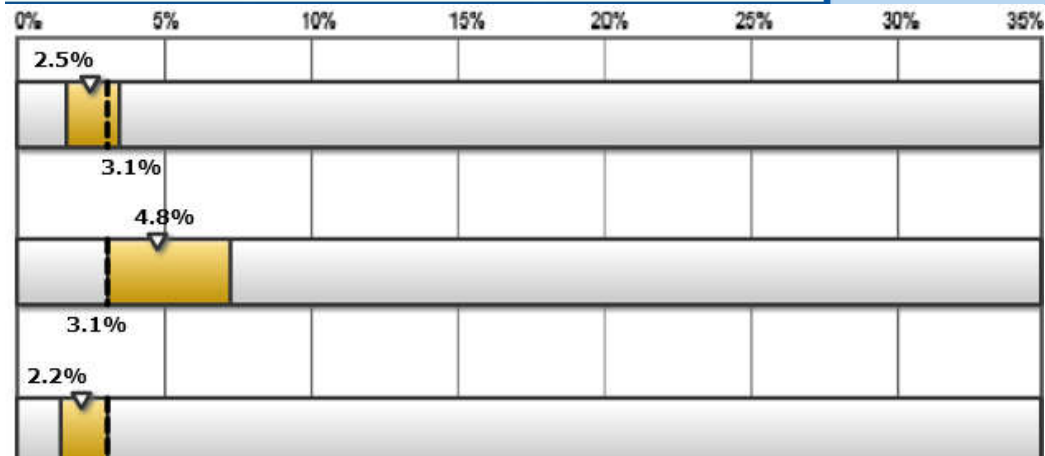
Timely &
effective care

Complications

Readmissions &
deaths

Use of medical
imaging

Payment & value
of care



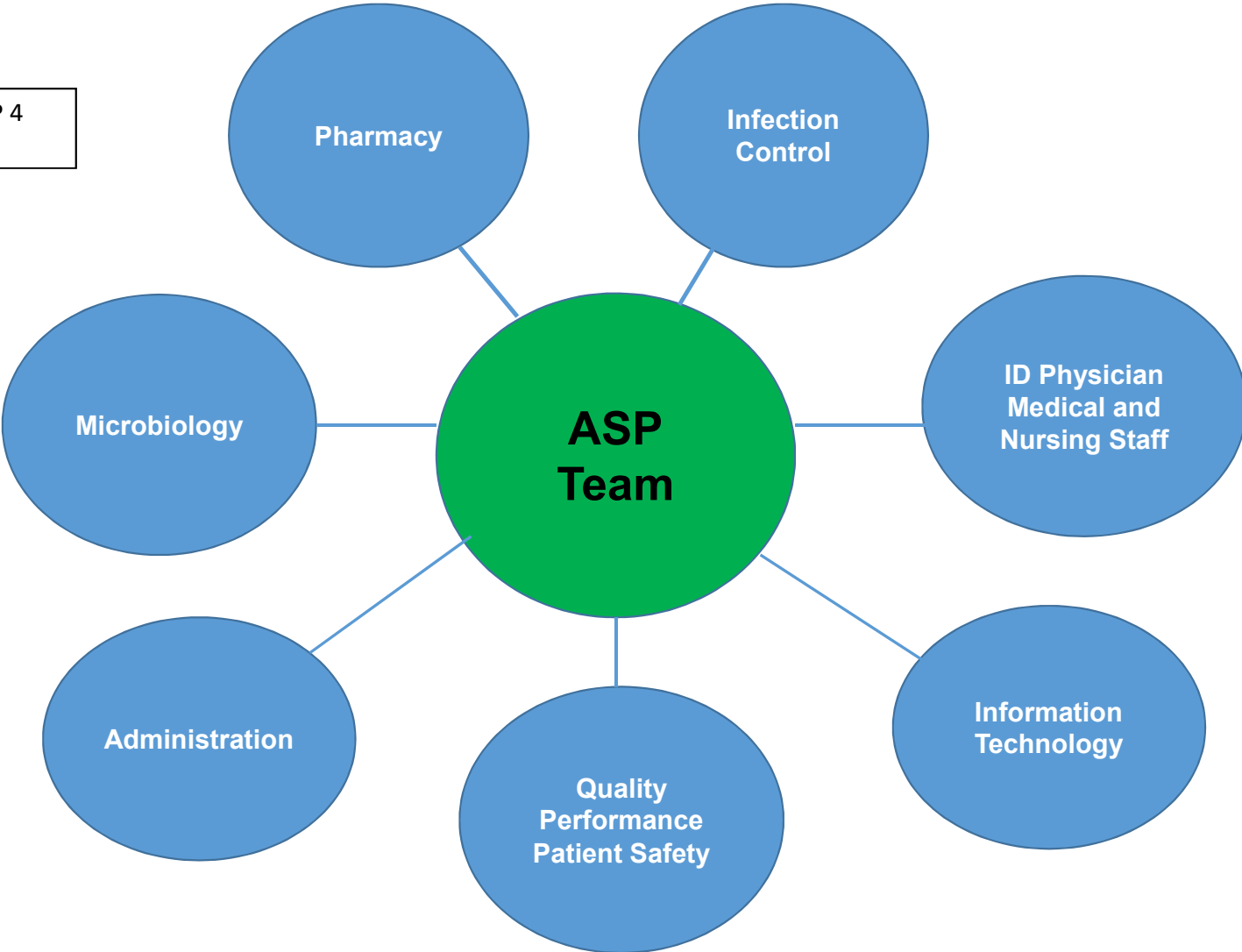
CDC Core Element 2: Accountability

- Leader or co-leaders responsible for program outcomes
 - Usually physician and pharmacist with expertise in antibiotic use, training, respect from peers, leadership and mentoring skills
 - Clear, measureable goals established
 - Performance review and incentivized payment model
 - Policy that defines noncompliance with ASP efforts and corrective actions
- Ensure specific training in AS
 - Certification program or training course
- Include different disciplines to remove silos

Certification Programs and Courses

- [MAD-ID. Antimicrobial stewardship training programs.](#)
- [Pediatric Infectious Diseases Society. Annual International Pediatric Antimicrobial Stewardship Conference website.](#)
- [The Society for Healthcare Epidemiology of America \(SHEA\). Training Course.](#)
- [IDWeek Premeeting Workshops.](#)
- [Society of Infectious Disease Pharmacists \(SIDP\). Antimicrobial stewardship. A certificate program for pharmacists.](#)
- [Stanford Medicine Online Continuing Medical Education \(CME\) Online CME Course. Antimicrobial stewardship: optimization of antibiotic practices.](#)

Meets MM 09.1.01 EP 4 requirements



Dellit TH. CID 2007;44:159-77.
Barlam TF. Clin Infect Dis 2016;62(10):e51-77.

Free Antimicrobial Stewardship Training

Stanford | **ONLINE**

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[Home](#) » [Courses](#) » Antimicrobial Stewardship: Optimization of Antibiotic Practices (CME)

ANTIMICROBIAL STEWARDSHIP: OPTIMIZATION OF ANTIBIOTIC PRACTICES (CME)

COURSE SYLLABUS

Course Outline:

- Introduction and Pre-course Assessment
- Unit 1: Mechanisms of Microbial Resistance
- Unit 2: Appropriate Pharmacotherapy
- Unit 3: ASP in Special Settings
- Unit 4: Components of an Effective ASP
- Unit 5: Implementing an Effective ASP
- Unit 6: Beyond Culture and Sensitivity: the future of ASP, Microbiology and Infection Control

CDC Core Element 3: Drug Expertise

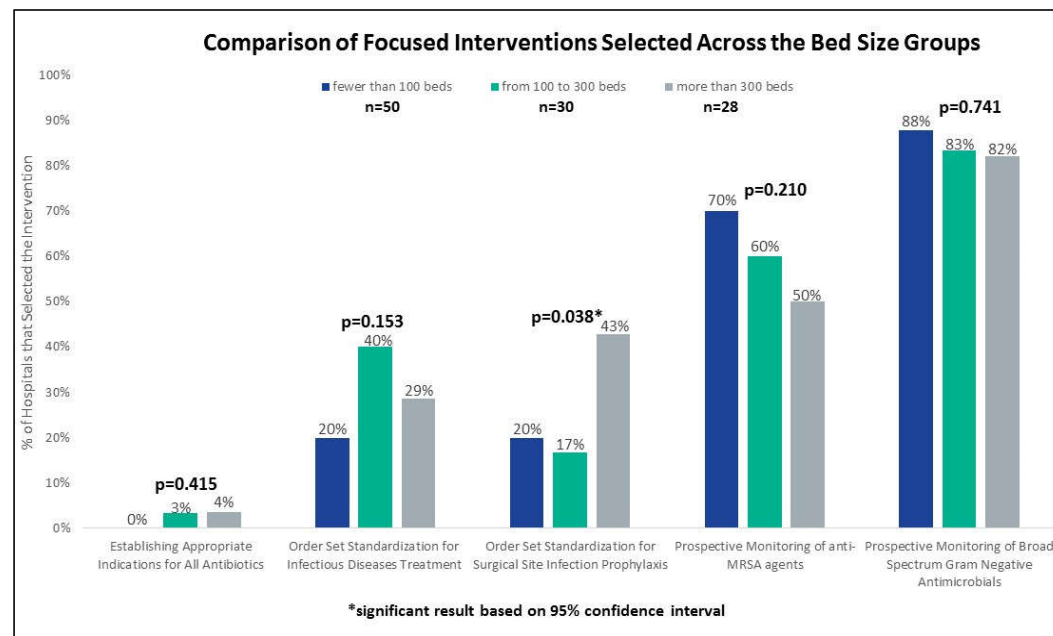
- Pharmacist leader with expertise in antibiotic use
 - Good leadership and team skills; respect from peers
 - Mentors and trains pharmacy staff in antibiotic use
- Consider offsite expert support if smaller institution

CDC Core Element 4: Actions to Support Optimal Antibiotic Use

Meets MM 09.1.01 EP 6 requirements

- Implement at least one intervention to improve antibiotic use
 - Align with local needs
 - Should be measurable
- Specific interventions
 - Prior approval
 - Require documentation of indication and duration
 - Prospective monitoring of anti-MRSA or broad spectrum agents
 - Order set standardization/guideline development
 - CAP, HAP, UTI, Sepsis, Surgical Prophylaxis, cSSSI
 - Antibiotic “time-out” or stop order
 - Antibiotic allergy assessment
 - Criteria-for-use forms
 - IV to PO protocols
 - PKDS/Dose Optimization/Renal Dosing protocols
 - Rapid diagnostics and biomarkers (procalcitonin)

“We suggest **against** relying solely on didactic educational materials for stewardship.”



Barlam TF. *Clin Infect Dis* 2016;62(10):e51-77.
 NQF: Antibiotic Stewardship in Acute Care: A Practical Playbook 2016.

Clinical Decision Support



Sentri7[®]

Signed in: Daragjati, Florian
St. Vincents Southside
7/25/2018

Dashboard

Rules

Patients

Reports

Admin

Searching Active Patients

Search

ASC IV to PO (Abx) | ASC IV to PO (Non-Abx) | ASC Therapeutic Init. 1 | ASC Therapeutic Init. 2 | ASC Therapeutic Init. 3 | ASC Therapeutic Init. 4 | ASC Renal Dosing 1 | ASC Renal Dosing 2 | ASC Renal Dosing 3 | ASC Renal Dosing 4 | **ASC AMS 1** | ASC AMS 2 | ASC Anticoagulation 1 | ASC Anticoagulation 2 | ASC Quality & Safety 1 | ASC PK Monitoring | ASC Open Follow Ups | Southside-Specific Rules | ASC TPN Assessment | [Select Service Area Filter](#)

+ ASC Bug/Drug Mismatch - Sterile Sites (0) ⓘ

Rule is current



Suggested Action:

Investigate the appropriateness of Carbapenem(s) OR Cefepime OR Piperacillin/tazobactam OR Quinolone(s) use in this patient. Culture results display that an antimicrobial from the above options is resistant.

+ ASC Atypical double coverage (0) ⓘ

Rule is current



Suggested Action:

Concomitant levofloxacin and azithromycin is rarely indicated. Assess patient for appropriateness of therapy and de-escalate to one agent if possible.

+ ASC Anaerobic double coverage (0) ⓘ

Rule is current



Suggested Action:

Double anaerobic coverage is RARELY indicated (examples of appropriate use include documented liver or brain abscess, or for clindamycin - necrotizing fasciitis). For all other indications, recommend discontinuing one of the drugs.

Please pay special attention to those patients with a c. diff infection receiving systemic metronidazole.

+ ASC Beta-lactam double coverage (0) ⓘ

Rule is current



Suggested Action:

Two beta-lactam antimicrobials are RARELY indicated. Suggest evaluating indication and questioning rational for dual beta-lactam therapy (examples of when use may be appropriate include multidrug resistance and empiric meningitis therapy).

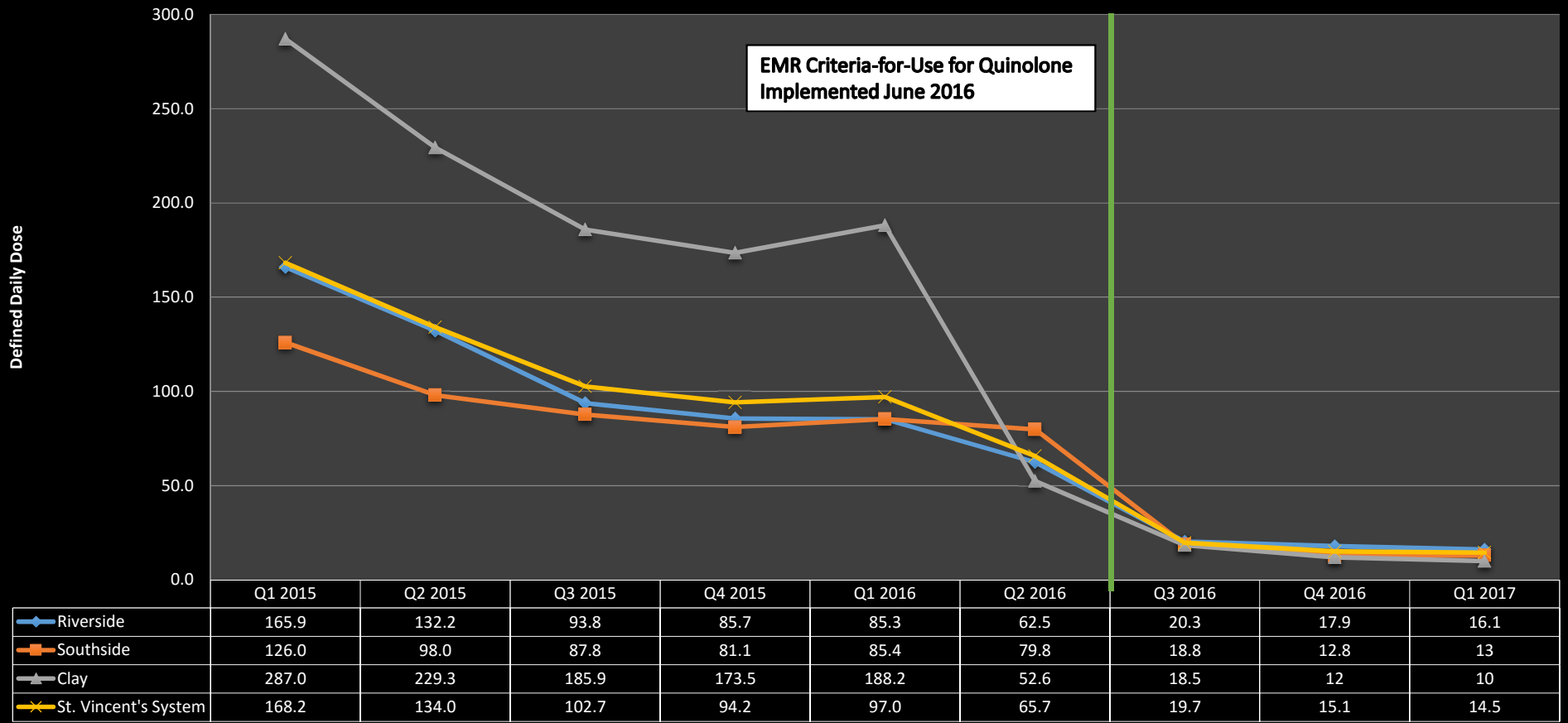
Electronic Criteria-for-Use Forms

Daptomycin Utilization Criteria	Tigecycline Utilization Criteria
<p>The Medical Executive Committee has restricted Daptomycin (Cubicin®) for treatment of one or more of the following criteria.</p> <p>Note: Do NOT use daptomycin for pulmonary infections. It is inactivated by lung surfactants. Vancomycin or linezolid are preferred for treatment of MRSA CNS infections.</p> <p>Obtain baseline and weekly CPK levels.</p> <p>Select one of the following reasons for Daptomycin use in this patient.</p> <ul style="list-style-type: none"><input type="radio"/> MRSA/ MR-coagulase negative staphylococcus infection-vancomycin MIC greater than/equal to 2<input type="radio"/> MRSA/ MR-coagulase negative staphylococcus infection-unsatisfactory response to vancomycin<input type="radio"/> MRSA/ MR-coagulase negative staphylococcus infection-vancomycin allergy (not infusion related)<input type="radio"/> VRE infection resistant to ampicillin and/or linezolid<input type="radio"/> Other <p>If patient DOES NOT MEET any of the criteria above, please document infection below. An infectious disease consult is required. The antibiotic stewardship pharmacist will review and contact prescriber.</p> <div></div>	<p>The Medical Executive Committee has restricted Tigecycline (Tygacil®) to infections for the conditions listed below.</p> <p>Select one of the following reasons for Tigecycline use in this patient.</p> <ul style="list-style-type: none"><input type="radio"/> MRSA/MR-coag neg staph-unsatisfactory response to vancomycin for at least 96 hours and/or MIC >=2<input type="radio"/> Allergy to Vancomycin (not infusion-related)<input type="radio"/> Suspected/confirmed MRSA/VRE/ESBL-producing intra-abdominal infection AND allergy to combination of penicillins/metronidazole<input type="radio"/> Other <p>If patient DOES NOT MEET any of the criteria above, please document infection below. An infectious disease consult is required. The antibiotic stewardship pharmacist will review and contact prescriber.</p> <div></div> <p>NOTE: Tigecycline should NOT be used as empiric therapy in Nosocomial Pneumonia</p>

“We suggest incorporation of computerized clinical decision support at the time of prescribing into ASPs.”

Impact of Criteria-for-Use Forms

St. Vincent's Healthcare Quinolone Use



Order Sets

“In hospitalized patients, we suggest ASPs advocate for the use of alternative dosing strategies vs. standard dosing for broad-spectrum β -lactams to decrease costs....and improve outcomes”

HCAP Antibiotics (Planned Pending)		
Medications		
<input checked="" type="checkbox"/>	Healthcare Acquired Pneumonia	T;N, For suspected or confirmed HCAP
Antibiotics: HCAP (ICU + Non-ICU)		
	Preferred Regimen	
<input type="checkbox"/>	cefepime (Maxipime)	1 q, inj INTERMIT, IV piggyback, q8hr, Indication: Healthcare Associated Pneumonia, Duration: 21 dose/times, Infuse over: 3 hr
	*** Plus ***	
<input type="checkbox"/>	vancomycin	20 mg/kg, inj INTERMIT, IV piggyback, once, Indication: Healthcare Associated Pneumonia, and PKDS to dose/follow
	For aspiration/suspected anaerobes:	
<input type="checkbox"/>	metronIDAZOLE (Flagyl)	500 mg, inj PREMIX, IV piggyback, q8hr, Indication: Healthcare Associated Pneumonia, Duration: 21 dose/times
	For suspected atypical pathogens:	
<input type="checkbox"/>	azithromycin (Zithromax)	500 mg, inj INTERMIT, IV piggyback, q24hr, Indication: Healthcare Associated Pneumonia, Duration: 7 dose/times
CAP Antibiotics (Planned Pending)		
Medications		
Antibiotics: CAP		
	Preferred Regimen	
<input type="checkbox"/>	ampicillin-sulbactam (Unasyn)	3 q, inj INTERMIT, IV piggyback, q6hr, Indication: Community Acquired Pneumonia, Duration: 28 dose/times
	*** Plus ***	
<input type="checkbox"/>	azithromycin (Zithromax)	500 mg, inj INTERMIT, IV piggyback, q24hr, Indication: Community Acquired Pneumonia, Duration: 7 dose/times
	Alternative Regimen 1	
<input type="checkbox"/>	cefTRIAXone (Rocephin)	2 q, inj INTERMIT, IV piggyback, q24hr, Indication: Community Acquired Pneumonia, Duration: 7 dose/times
	*** Plus ***	
<input type="checkbox"/>	azithromycin (Zithromax)	500 mg, inj INTERMIT, IV piggyback, q24hr, Indication: Community Acquired Pneumonia, Duration: 7 dose/times
	Alternative Regimen 2	
<input type="checkbox"/>	levofloxacin (Levaquin)	750 mg, inj PREMIX, IV piggyback, q24hr, Indication: Community Acquired Pneumonia, Duration: 7 dose/times

“We suggest ASPs implement interventions to improve antibiotic use and clinical outcomes that target patients with specific infectious diseases syndromes.”

Antibiotic Indication Requirement

Details for **piperacillin-tazobactam (Zosyn)**

Details | Order Comments | Diagnosis

+ [Icons]

*Strength dose: 4.5	*Strength dose unit:
Drug Form: inj INTERMIT	*Route of administration:
*Frequency: q8hr	PRN:
PRN reason:	Pharmacy order priority:
Clinical Instructions:	*Antibiotic indication:
*Requested start date and time: 08/16/16 16:00 EDT	Duration: 5
Duration unit: day	Stop date and time: 08/21/2016 0800 EDT

Abdominal Infection
Community Acquired Pneumonia
Genital/GYN Infection
Healthcare Associated Pneumonia
Pyelonephritis
Sepsis
Skin/Soft tissue/Bone Infection
Other - enter in comments

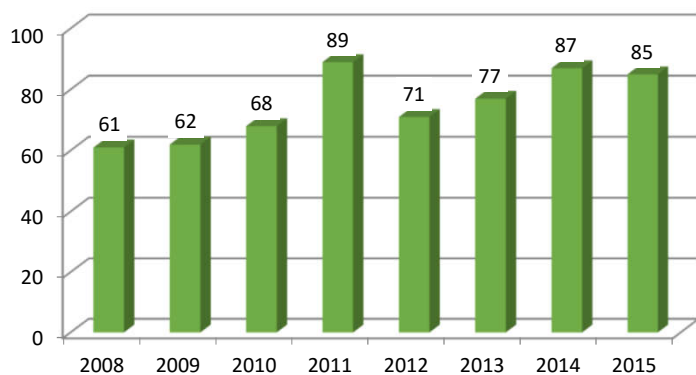
“We suggest the use of strategies (e.g., antibiotic time-outs, stop orders) to encourage prescribers to perform routine review of antibiotic regimens to improve antibiotic prescribing”

Empiric duration prebuilt into order

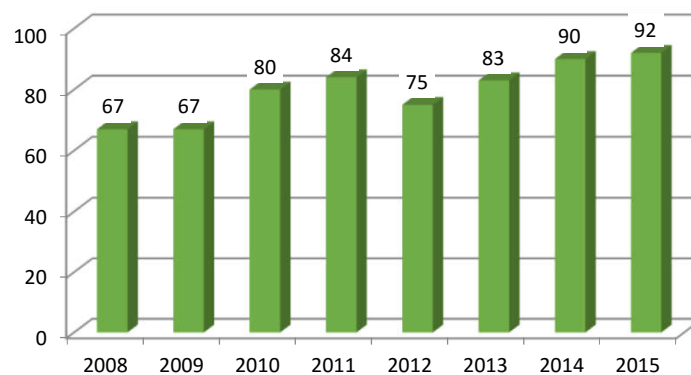
Local Antibigram (*P. aeruginosa* susceptibility)

Example presentation to
meet MM 09.1.01 EP 2

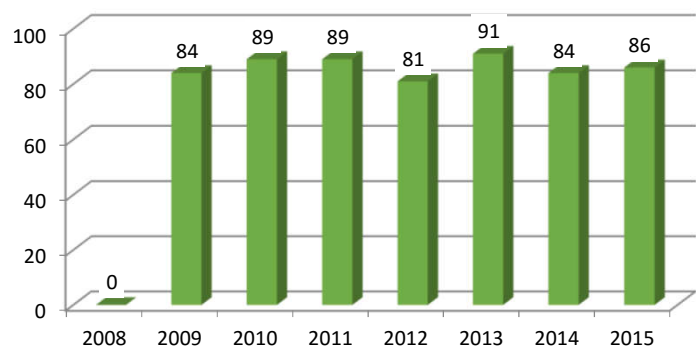
Cefepime



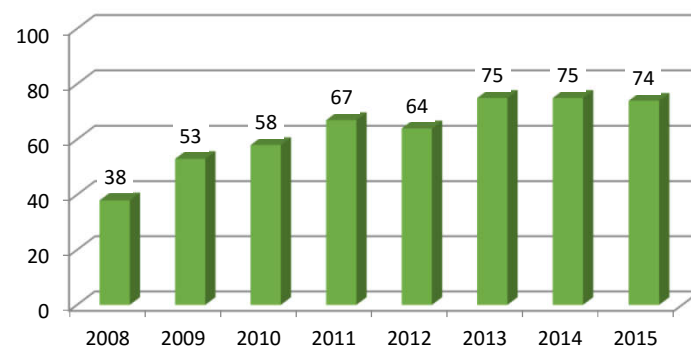
Meropenem



Piperacillin/Tazobactam

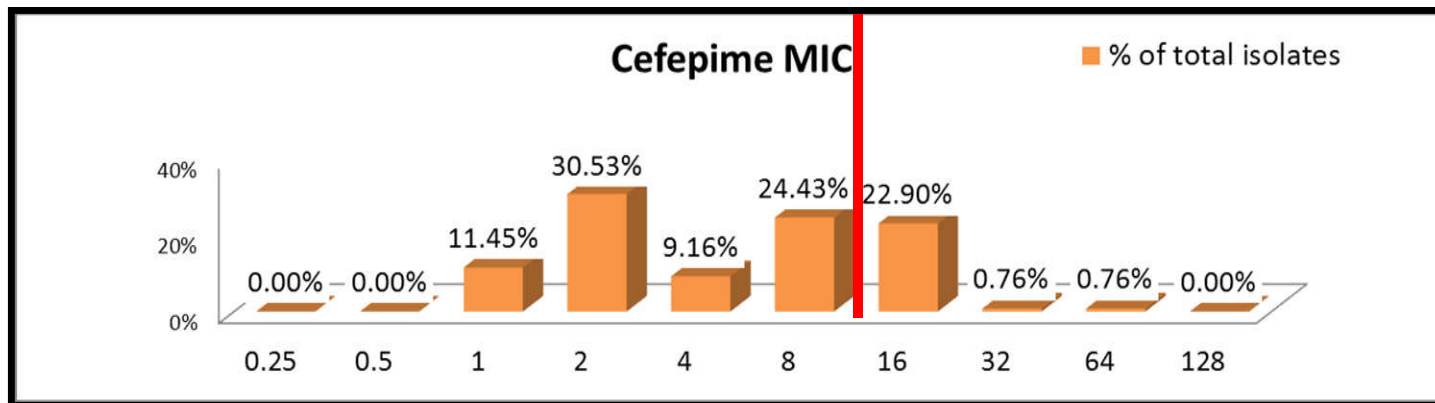


Ciprofloxacin



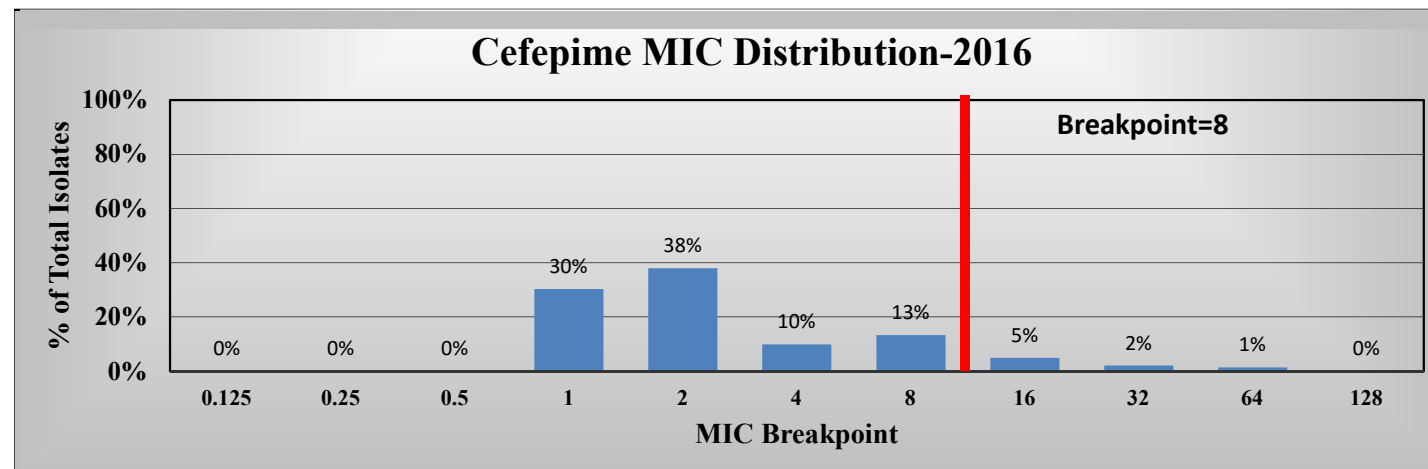
MIC Distribution Data

2011



Example presentation to
meet MM 09.1.01 EP 2

2015



Example of a Clinical Pathway: Pneumonia

Empiric Antibiotic Therapy - General Medical Unit (including nursing home patients with suspected strep pneumonia)
IV antibiotics will automatically be switched on day 3 to oral therapy. On day 3 of IV antibiotic therapy, if patient does not meet criteria for antibiotic switch, physician must re-write antibiotic orders.

- ☐ Ceftriaxone (Rocephin) 1 gm IVPB every 24 hours times 3 doses **plus one of the following:**
Azithromycin 500 mg orally every 24 hours times 3 doses **OR** Doxycycline 100 mg orally every 12 hours times 6 doses if patient is allergic to macrolide.

Give both meds STAT if not started in ED.

Then convert to

Cefuroxime (Ceftin) 500 mg orally every 12 hours.

Automatic IV to PO switch

OR If patient has a documented cephalosporin allergy:

- ☐ Levofloxacin 500 mg IVPB every 24 hours times 3 doses, then 500 mg orally every 24 hours (ID consult required if allergic reaction not documented). Give STAT if not started in ED.

Empiric Antibiotic Therapy - Admit Directly to ICU

- ☐ Ceftriaxone (Rocephin) 1 gm IVPB every 24 hours **plus one of the following:**
Azithromycin 500 mg IVPB every 24 hours **OR** Doxycycline 100 mg IVPB every 12 hours if patient is allergic to macrolide.
Give both meds STAT if not started in ED

OR If patient has a documented cephalosporin allergy:

- ☐ Levofloxacin 500 mg IVPB every 24 hours (ID consult required if allergic reaction not documented) **plus**
Aztreonam 1 gm IVPB every 8 hours times 3 doses. *For continuation of Aztreonam after 3 doses, Infection Disease consult is required.*

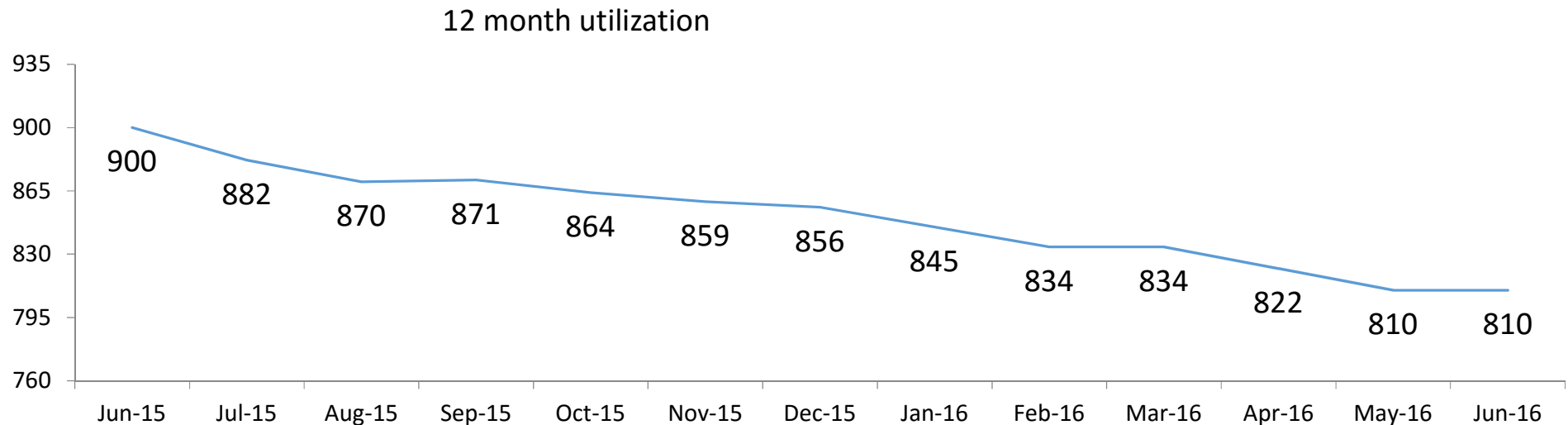
CDC Core Element 5: Tracking and Monitoring of Antibiotic Prescribing, Use, and Resistance

- Antibiotic utilization
 - Days of Therapy (DOT); Defined Daily Dose (DDD); antibiotic acquisition/purchase data
 - CDC AUR Initiative
 - Standardized Antibiotic Administration Ratio (SAAR)
 - Unintended consequences
 - *C.difficile*-associated disease (CDAD), adverse effects, resistance rate (antibiogram)
 - Patient outcomes
 - Clinical response, 30-day readmission rate, mortality
 - Process measures
 - Appropriateness of therapy, documentation of indication for use, adherence to guidelines or order sets

Example Tracking Mechanisms

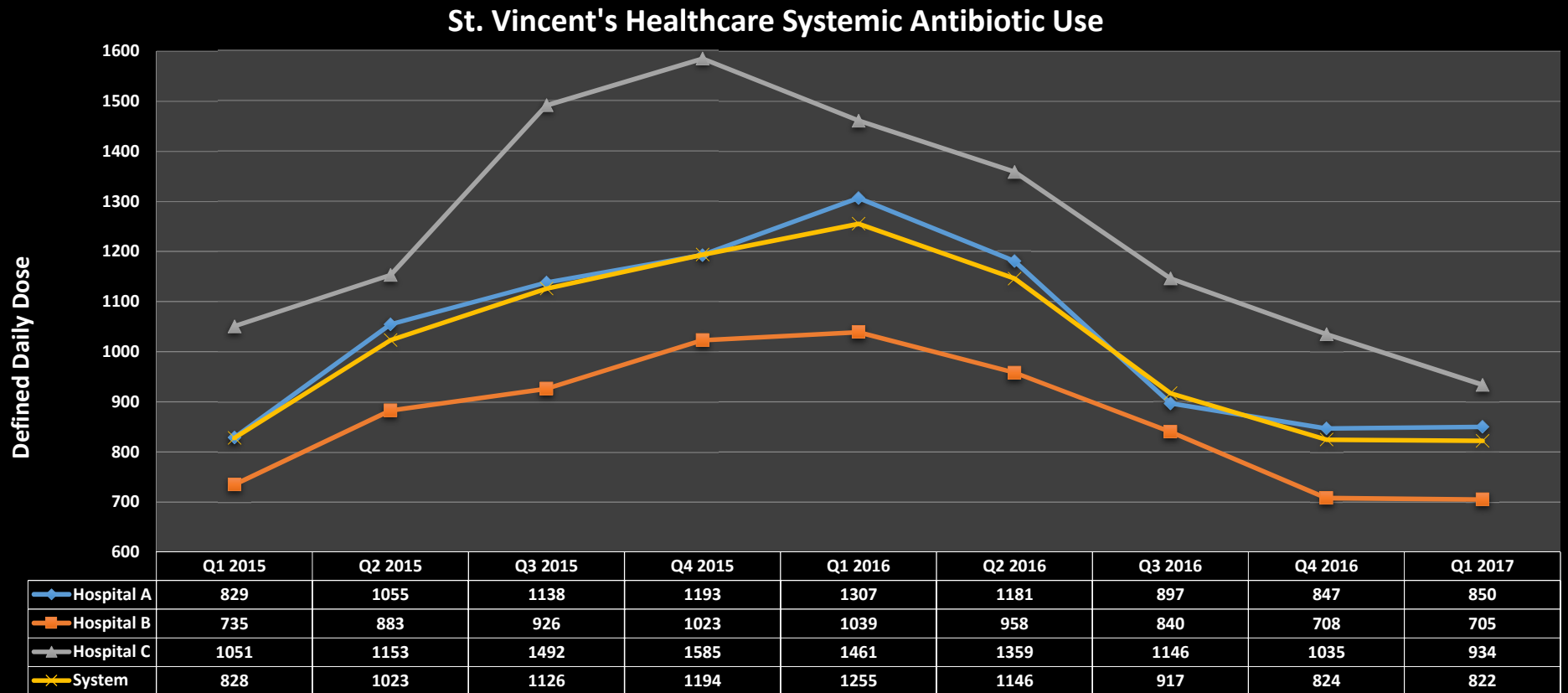
Rolling Averages (Last Month of Data - March 2017)									
	System FY16	Facility FY16	System FY17	Facility FY17	TAG Recommendation	3 month	6 month	9 month	12 month
Systemic Antibiotics	831.4	1049.5	805.5	990.1	N/A	975.6	972.9	990.1	1001.6
Rolling Averages (Last Month of Data - March 2017)									
	System FY16	Facility FY16	System FY17	Facility FY17	TAG Recommendation	3 month	6 month	9 month	12 month
Specific Agents									
Aztreonam	2.5	0.7	1.9	0.0	3.0	0.0	0.0	0.0	0.3
Ceftaroline	1.0	0.3	0.9	0.7	1.0	0.4	0.6	0.7	0.6
Daptomycin	7.7	1.9	7.4	1.4	7.0	2.0	1.8	1.4	2.3
Ertapenem	4.7	3.5	2.7	4.6	5.0	4.7	4.8	4.6	3.9
Fidaxomicin	0.4	0.4	0.3	0.0	N/A	0.0	0.0	0.0	0.2
Linezolid	3.8	4.5	3.7	5.3	3.0	5.9	5.7	5.3	4.9
Tigecycline	0.8	0.2	0.4	0.0	1.0	0.0	0.0	0.0	0.0
Vancomycin	99.3	222.2	99.6	186.2	N/A	169.8	165.0	186.2	194.7
Rolling Averages (Last Month of Data - March 2017)									
	System FY16	Facility FY16	System FY17	Facility FY17	TAG Recommendation	3 month	6 month	9 month	12 month
Drug Classes									
Carbapenems	23.5	11.8	23.9	10.6	21	10.6	11.4	10.6	9.3
Cephalosporins	245.0	368.0	219.2	379.7	N/A	354.5	374.2	379.7	364.9
3rd Generation Cephalosporins	67.2	81.2	75.7	114.2	N/A	75.5	93.8	114.2	110.0
4th Generation Cephalosporins	64.4	151.8	27.9	95.4	N/A	118.2	135.1	95.4	99.8
Penicillins	150.8	136.7	176.1	174.8	N/A	188.2	189.1	174.8	175.1
Extended - Spectrum Penicillins	76.2	79.1	102.3	121.9	N/A	142.1	136.5	121.9	123.2
Quinolones	84.7	65.3	69.3	6.1	N/A	6.6	3.3	6.1	15.6

Example Tracking Mechanisms



- 8.2% drop in 12 month period
 - Decrease equates to \$8M* savings to the system
- *Does not include inflation

Example Tracking Mechanisms



CDC Core Element 6: Reporting Information on Improving Antibiotic Use and Resistance

- Report information to all stakeholders
 - All healthcare providers, nursing, microbiology, hospital leadership
 - Trends, interventions made and % accepted by providers
- Report to medical staff committee meetings and health system board
- Post data on intranet and physician lounge
- Available for leadership, staff, and patients
- Unit-specific and provider-specific (if available) reports

Antimicrobial Utilization Review

Provider A	318
Abdominal Infection	22
cefepime	1
ertapenem	1
levofloxacin	2
meropenem	2
metroNIDAZOLE	5
piperacillin-tazobactam	2
vancomycin	9
Bacteremia/Endocarditis	8
fluconazole	1
meropenem	1
sulfamethoxazole-trimethoprim	2
vancomycin	4
C. difficile Infection	2
vancomycin	2
Community Acquired Pneumonia	10
azithromycin	1
cefepime	1
ceftriaxone	1
meropenem	2
vancomycin	5
Febrile neutropenia	1
cefepime	1
Fungal Infection	4
fluconazole	4
Healthcare Associated Pneumonia	45
cefepime	6
ceftriaxone	1
cephalexin	1
clindamycin	1
levofloxacin	1

vancomycin	2553
Abdominal Infection	73
Bacteremia/Endocarditis	33
C. difficile Infection	21
Community Acquired Pneumonia	45
Febrile neutropenia	12
Genital/GYN Infection	5
Healthcare Associated Pneumonia	314
Meningitis	19
Other - enter in comments	42
Pyelonephritis	7
Sepsis	356
Skin/Soft tissue/Bone Infection	486
Surgical Prophylaxis	1115
UTI/Cystitis	25
cefepime	635
Abdominal Infection	55
Bacteremia/Endocarditis	1
Community Acquired Pneumonia	19
Febrile neutropenia	9
Healthcare Associated Pneumonia	177
Meningitis	5
Other - enter in comments	24
Pyelonephritis	14
Sepsis	201
Skin/Soft tissue/Bone Infection	90
UTI/Cystitis	40

Meets MM 09.1.01 EP 7 requirements

Management of ABSSSIs in Adults

Meets MM 09.1.01 EP 8 requirements

Nonpurulent (Necrotizing Infection, Cellulitis, Erysipelas)

Purulent (Furuncle, Carbuncle, Abscess)

Severe

Moderate

Mild

Severe

Moderate

Mild

- Cefazolin 2g IV q8hr
- Clindamycin 900mg IV q8hr

- Dicloxacillin 500mg PO QID
- Cephalexin 500mg PO QID
- Clindamycin 300mg PO q8hr

Emergent Surgical Inspection/Debridement to rule out necrotizing process

Empiric or Defined Polymicrobial Treatment

- Vancomycin 15mg/kg IV q12hr PLUS Piperacillin/tazobactam 4.5g IV q8hr OR Cefepime 2g IV q8hr (Penicillin allergy)

Monomicrobial Defined Treatment (Necrotizing Infections)

Streptococcus pyogenes or *Clostridial* spp.

- Penicillin G 6 MU IV q4hr PLUS Clindamycin 900mg IV q8hr
- Vibrio vulnificus*
- Doxycycline 100mg IV q12hr PLUS Ceftazidime 2g IV q8hr
- Aeromonas hydrophila*
- Doxycycline 100mg IV q12hr PLUS Ciprofloxacin 400mg IV q12hr

**I & D
C & S**

**I & D
C & S**

I & D

Empiric Treatment

- Vancomycin 15mg/kg IV q12hr

Alternative Treatment (ID Consult Required)**

- Ceftaroline 600mg IV q12hr
- Daptomycin 4mg/kg IV q24hr
- Linezolid 600mg IV/PO q12hr

Defined Treatment

- MRSA
- See Empiric
- MSSA
- Cefazolin 2g IV q8hr
- Clindamycin 600mg-900mg IV q8hr

Empiric Treatment

- Vancomycin 15mg/kg IV q12hr
- TMX/SMP (Bactrim) DS 1-2 tab PO BID
- Doxycycline 100mg PO BID

Defined Treatment

- MRSA
- TMX/SMP (Bactrim) DS 1-2 tab PO BID
- MSSA
- Dicloxacillin 500mg PO QID
- Cephalexin 250mg-500mg PO QID

** Should be used if patient has a vancomycin allergy (not infusion-related), refractory infection despite appropriate vancomycin trough levels for 72-96 hours, VRE infection, or vancomycin MIC \geq 2 (confirmed by e-test).. ID consult will be automatically ordered if one is not present already.

CDC Core Element 7: Education of Clinicians, Patients, and Families

- Education provided on regular basis
 - Staff
 - Providers
 - Pocket guides
 - Newsletter articles
 - Medical Grand Rounds
 - Presentations at department meetings
 - patients and families
- Consider use of multiple media sites
 - Intranet, employee newsletters, blogs, social media
- Highlight system goals
- Integrate patient stories
- Incorporate posters and memos
 - Avoid links to lengthy documents

Suggested Tools and Resources

General Education

- Centers for Disease Control and Prevention (CDC). [Get smart about antibiotics week website.](#)

Clinical Education

- Wake Forest School of Medicine. [Get smart about antibiotics: an antibiotic stewardship curriculum for medical students.](#)

Patient Education

- Choosing Wisely. [Patient-friendly resources.](#)
- Consumer Reports Health. [In depth: antibiotics.](#)
- Choosing Wisely. [Antibiotics: Will They Help or Hurt You?](#) New York NY: Consumer Reports; 2015.
- Choosing Wisely. [Antibiotics: When you need them – and when you don't.](#) New York, NY: Consumer Reports Health; 2014.

Example Patient Education Tool

5 Questions to Consider Before Taking Antibiotics:

- 1 Do I really need antibiotics?
- 2 What are the risks and side effects?
- 3 Are there simpler, safer options?
- 4 How much do they cost?
- 5 How do I take antibiotics so they're safe and effective?

The recommendations in this brochure were developed by the:

- American Academy of Dermatology
- American Academy of Family Physicians
- American Geriatrics Society

This report is for you to use when talking with your health care provider.

It is not a substitute for medical advice and treatment. Use of this report is at your own risk.

To learn more, please visit ConsumerHealthChoices.org/antibiotics

Choosing Wisely

An initiative of the ABIM Foundation

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Antibiotics: Will They Help You or Hurt You?



Consumer Reports suggests asking your health care provider questions before taking any antibiotics.

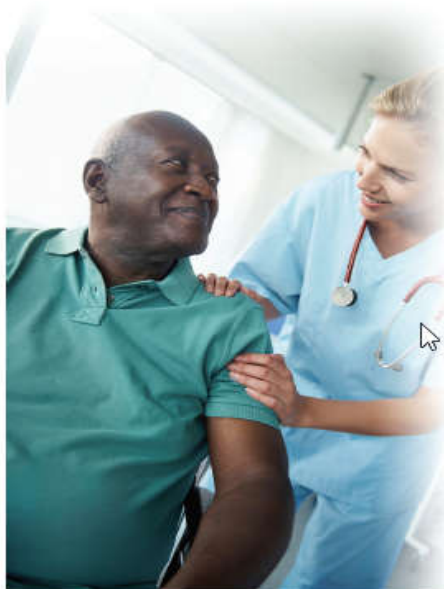
ConsumerReports

Meets MM 09.1.01 EP 3 requirements

Example Patient Education Tool

Antibiotics can help you. But they can also harm you.

Talk to your health care provider to make sure you only use antibiotics for the right reasons — and at the right time. If you do take antibiotics, make sure to take full amount that you were prescribed.



Meets MM 09.1.01 EP 3 requirements

Do You Really Need Antibiotics?

Seniors often get antibiotics for:

- Bladder infections
- Sinus infections
- Eczema (itchy, red rashes)
- Wounds, or torn skin, from surgery
- Colds and runny noses

Before you take antibiotics, ask if you really need them. Also ask about the risks and benefits. Remember, antibiotics don't work for viral infections, like the common cold.

Antibiotics Have Risks

Antibiotics can prevent and treat some infections. But they also have these risks:

- Diarrhea
- Nausea and vomiting
- Vaginal infections
- Allergic reactions, such as:
 - Blisters, rashes, and face or throat swelling
- Damage to nerves and tendons

If you use antibiotics too much or when you don't need them, they may not work for you someday. This is called “antibiotic resistance.”

Ways to Use Fewer Antibiotics

Consumer Reports says that you might get fewer infections if you:

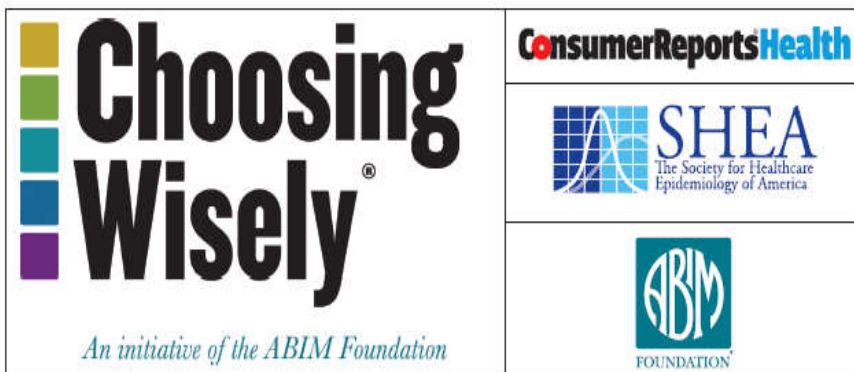
- Wash your hands frequently
- Get your vaccines and flu shots
- Ask if you can wait a few days before starting antibiotics. Then, call or visit your health care provider again to see if you really do need them.

If you're in the hospital and have tubes or catheters, ask every day if they can be taken out. This can keep infections away. And make sure everyone washes their hands when they come to see you.



Patient Accountability for Antibiotic Prescribing

Meets MM 09.1.01 EP 3 requirements



Antibiotic treatment in the hospital:

Sometimes it can be stopped

This report is for you to use when talking with your health-care provider. It is not a substitute for medical advice and treatment. Use of this report is at your own risk.

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Antibiotics are strong drugs. They fight the infections caused by bacteria. But antibiotics can do more harm than good if you don't need them. So the U.S. Centers for Disease Control and Prevention (CDC) is now urging hospitals to cut back on these drugs when they are not needed. Here's what you should know.

You might get antibiotics when you check in to the hospital.

This can happen if you have an infection that may be serious, like pneumonia. Your doctor wants to treat you right away, even before you can get test results.

Your doctor may give you more than one antibiotic. Or you may get a "broad-spectrum" antibiotic that kills many types of bacteria.

Doctors should review your drugs after test results are in.

Your test results usually come on your third day in the hospital. At this point the doctor should review your drugs:

If test results don't show an infection, and you're doing well, usually the doctor can stop the antibiotics.

If the tests do show an infection, the doctor can often modify your treatment to a single antibiotic. Or

Advice from Consumer Reports

How to protect against antibiotic overuse in the hospital

Up to half of antibiotic prescriptions in U.S. hospitals are unneeded or inappropriate, says the CDC. If you are prescribed antibiotics during a hospital stay, consider asking the questions below.

What is this drug for? If your doctor thinks you have a bacterial infection, ask if you can be tested for it before you start antibiotics.

Do I really need antibiotics, or can they be stopped? You can ask this question every day, but on day three might be best. By then, your test results should be back. Ask the doctor to check your prescription now that your test results are back. Tell your doctor that you only want antibiotics if you need them.

What type of antibiotic is it? If it's a broad-spectrum drug, ask if it's necessary. A narrow-spectrum antibiotic, such as penicillin, is usually a better choice.

How long should I take it? Ask your doctor to prescribe antibiotics for the shortest time possible.

Patient Education

Meets MM 09.1.01 EP 3 requirements

SpeakUp: Antibiotics

When do you really need an antibiotic?

Antibiotics are powerful drugs for fighting infections. They don't work for every sickness. This chart shows when you may be given an antibiotic.

Illness	Virus	Bacteria	Should you expect an antibiotic?
Bronchitis (in healthy children and adults)	✓	✓	May be recommended
Cold or runny nose	✓		No
Ear infection	✓	✓	May be recommended
Flu	✓		No
Fluid in the middle ear	✓		No
Sinus infection	✓	✓	May be recommended
Sore throat (except strep)	✓		No
Strep throat		✓	Yes
Urinary tract infection		✓	Yes

Information available on the Centers for Disease Control and Prevention website



Engaging Stakeholders

- Internal Medicine
 - More accessible and open to interventions
 - Goals are aligned with improving outcomes
 - Decreased LOS and resource utilization
 - Use of evidence-based order sets, improve unnecessary testing
 - cSSSI, UTI, CAP/HAP/VAP, Sepsis
 - Urine culture, *C. difficile* testing
- Critical Care
 - Follow up on sepsis de-escalation within 48-72 hr
 - Minimizing device risk

Engaging Stakeholders

- Surgery
 - Standardize surgical site infection prophylaxis order sets
 - Source control
- Emergency Medicine
 - Large role in correct initial diagnosis and antibiotic choice
 - Use broad spectrum agents often
- Midlevel providers
 - Adoption of standardized treatment pathways

Engaging Stakeholders

- Quality/Performance Improvement
 - Goals aligned with safety
 - Focus on reducing healthcare-acquired infections
 - Support standardization
 - Partners for reducing readmissions
 - Pneumonia, sepsis
- Nursing
 - Coordinate care of patient
 - Assess antibiotic allergy status and monitor for side effects
 - Assessment of patient condition (signs/symptoms of improvement or deterioration)
 - Appropriate culture
 - Urinalysis/Urine Culture; *C. difficile* testing

Engaging Stakeholders

- Microbiology/Laboratory
 - Promote optimal testing
 - C.difficile, UA/UC, Blood cultures
 - Culture/sensitivity reporting structure
- Informatics
 - Integration of interventions in the EMR
 - Order sets, criteria-for-use, clinical decision support, antibiotic time out, indication requirement

Testing Stewardship

TABLE 1. Society for Healthcare Epidemiology of America Choosing Wisely Recommendations

Final Choosing Wisely recommendations

1. Don't continue antibiotics beyond 72 hours in hospitalized patients unless patient has clear evidence of infection.
2. Avoid invasive devices (including central venous catheters, endotracheal tubes, and urinary catheters) and, if required, use no longer than necessary. They pose a major risk for infections.
3. Don't perform urinalysis, urine culture, blood culture, or *Clostridium difficile* testing unless patients have signs or symptoms of infection. Tests can be falsely positive leading to overdiagnosis and overtreatment.
4. Do not use antibiotics in patients with recent *C. difficile* without convincing evidence of need. Antibiotics pose a high risk of *C. difficile* recurrence.
5. Don't continue surgical prophylactic antibiotics after the patient has left the operating room.

Choosing Wisely runner-up items

1. Don't use antibiotics for apparent viral respiratory illnesses (sinusitis, pharyngitis, bronchitis, otitis media).
 2. Don't reuse syringes, needles, medication vials, or intravenous solutions.
 3. Don't come to work sick.
 4. Don't treat *Candida* in the respiratory tract specimen.
 5. Don't perform cultures of vascular catheter tips in the absence of suspected infection.
-

Urinalysis, Cultures, and Inappropriate Antibiotics

- 250 patients had a urinalysis on admission to general medicine
- 198 (79.2%) had no UTI sx or acute kidney injury
- 60% of those who had inappropriate U/A done had also a urine culture
- 21% of asymptomatic patients with abnormal U/A received antibiotics

Table 1. Chief Presenting Complaint of Patients Who Underwent Urinalysis (UA) Without Clinical Indication^a

Presenting Complaint	No. (%) [95% CI]
Fall, syncope	33 (16.7) [11.5-21.9]
Fever with documented nonurinary source ^b	28 (14.1) [9.2-19.0]
Chest pain, dyspnea	27 (13.6) [8.8-13.8]
Focal infectious nonurinary symptoms ^c	23 (11.6) [7.1-15.9]
Delirium, confusion, altered level of consciousness	18 (9.1) [5.0-13.0]
Fever without localizing symptoms	16 (8.1) [4.2-11.8]
Acute neurologic problem	16 (8.1) [4.2-11.8]
Weakness, functional decline	9 (4.5) [1.6-7.4]
Gastrointestinal tract bleed	6 (3.0) [0.6-5.4]
Abdominal pain	6 (3.0) [0.6-5.4]
Jaundice, ascites	4 (2.0) [0.0-4.0]
Change in urine color ^d	4 (2.0) [0.0-4.0]
Toxins, alcohol withdrawal, overdose	3 (1.5) [0.2-3.2]
Miscellaneous ^e	3 (1.5) [0.2-3.2]
Musculoskeletal pain	2 (1.0) [0.4-2.4]
Total	198 (100)

^a Includes 198 patients lacking guideline criteria for urinary tract infection or acute kidney injury.

^b Obvious alternative source of fever (eg, pneumonia, cellulitis) is present.

^c Indicates infectious symptoms (eg, productive cough, diarrhea) without documented fever.

^d Urinalysis in these cases was appropriately ordered to rule out hematuria or myoglobinuria.

^e Includes device-related problem, anaphylactic reaction, and new cancer diagnosis.

Reflex Urine Cultures

SUMMARY

Points of agreement

- Reflex urine cultures are frequently ordered for patients who do not have symptoms of urinary tract infections. This may result in inappropriate antimicrobial use.
- A negative pyuria/nitrate screen has a high negative predictive value for urine culture; a positive pyuria/nitrate screen does not have as high a positive predictive value for infection, particularly for catheterized patients. The value of reflex urine culture is primarily in detecting patients who do not need and should not have a urine culture done.
- Positive urinalysis is not useful in differentiating catheterized patients with asymptomatic bacteriuria from those with urinary tract infections. Additionally, a positive urinalysis result in this setting frequently results in inappropriate antimicrobial therapy.

Points requiring further consideration

- The clinical effectiveness of reflex urine culture has been documented primarily for women with cystitis in the outpatient setting. Its value in other patient populations is either less certain or has not been established.
- The most accurate urinalysis parameters, particularly white blood cell numbers, to determine the likelihood of a positive urine culture are not known.
- With CA UTI being used by the Centers for Medicare & Medicaid Services (CMS) and the National Healthcare Safety Network (NHSN) as important metrics of quality of care, are there laboratory approaches that can be used to differentiate patients with asymptomatic bacteriuria from those with urinary tract infections? In addition, what role should the laboratory play in assisting the antimicrobial stewardship committee to reduce the inappropriate use of antimicrobials in catheterized patients?

Peter H. Gilligan, Editor, *Journal of Clinical Microbiology*

When Nurses Collect Urine Cultures on Catheterized Patients

- Nurses influence urine culture testing in hospital
- Minimize triggers for inappropriate urine culturing → reduce antibiotics for asymptomatic bacteriuria

I anticipate collecting a urine sample for culture if my patient with an indwelling urinary catheter has...	Nurses (Answered Yes)	Assessment
Foul smelling urine	378 (96.7%)	Incorrect
Cloudy urine	376 (96.2%)	Incorrect
Sediments in urine	330 (84.8%)	Incorrect
Darker urine	207 (54.2%)	Incorrect

Florida

67 Counties

Population of 20,271,272 per 2015 census

223 Acute Care Hospitals

28 Long-term Acute Care Hospitals (LTACHs)

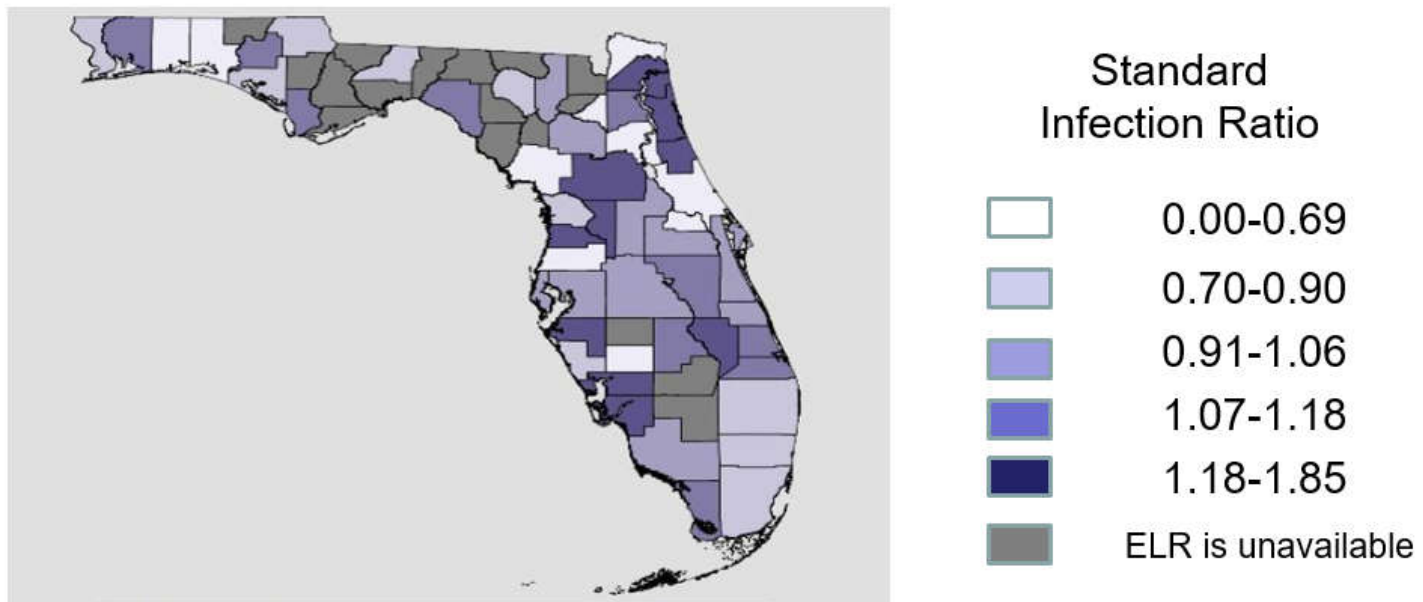
20 Rehab Hospitals

Division of Disease Control and Health Protection

To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



Florida's *Clostridium Difficile* Infection (CDI) Rates 2015



Division of Disease Control and Health Protection

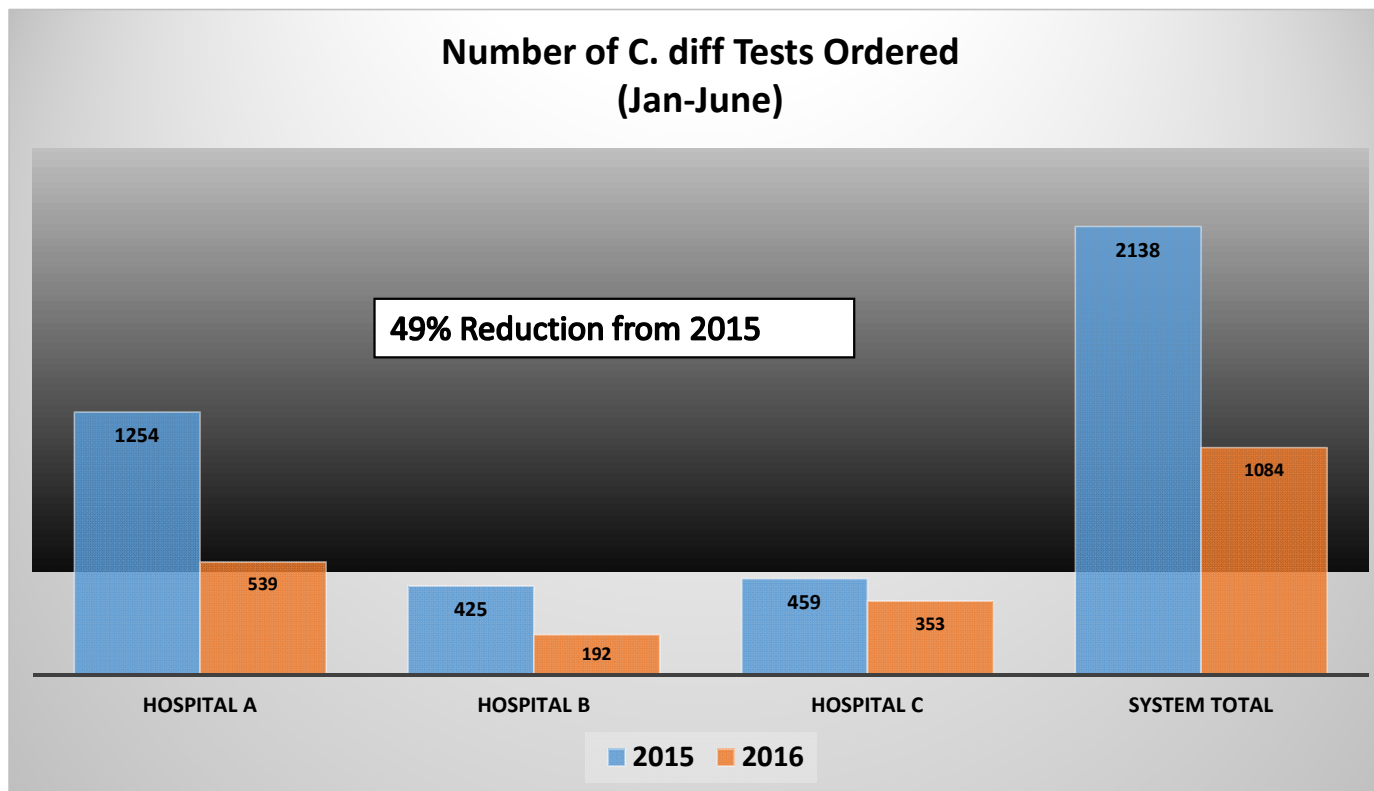
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



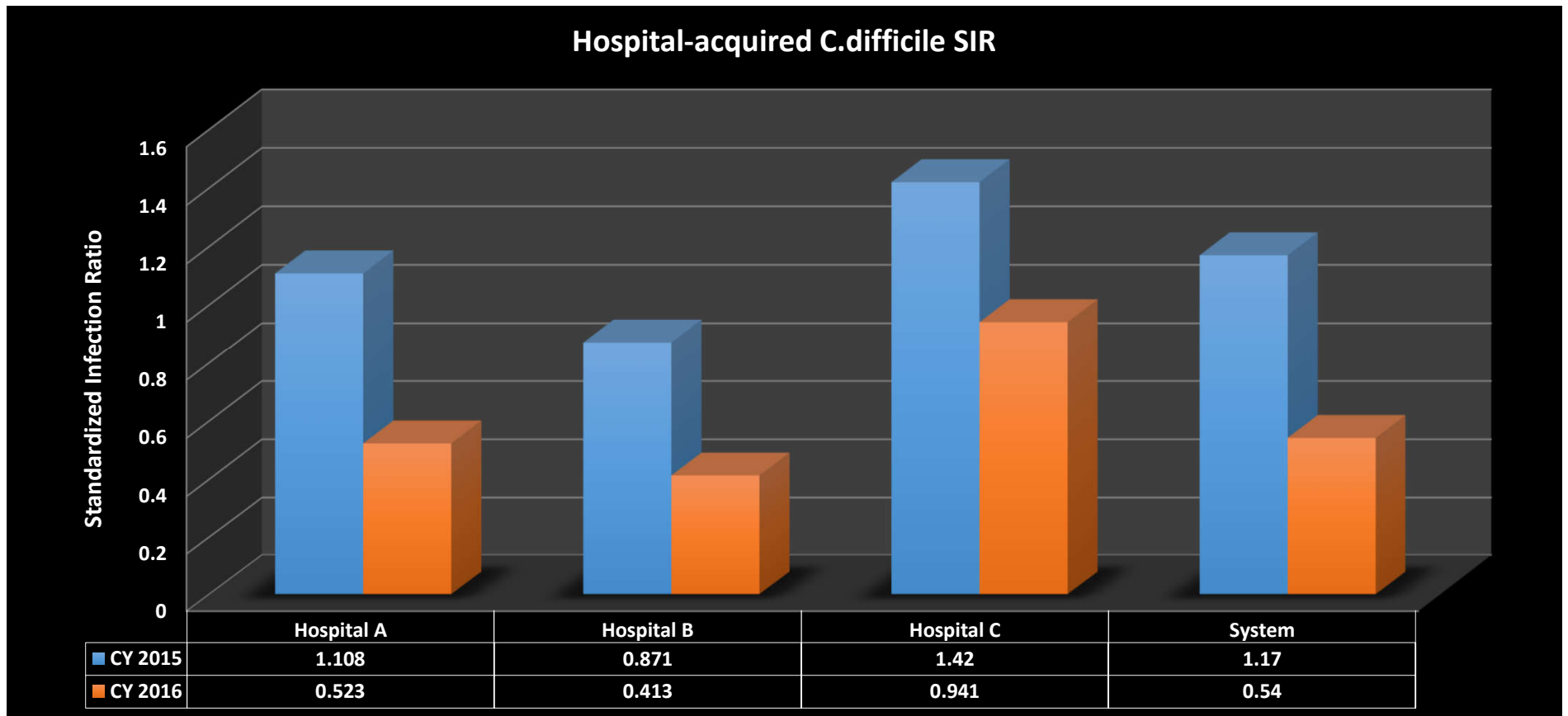
C. difficile Testing and EMR Intervention

Clostridium Difficile Order - Criteria For Use	
All of the following criteria must be met prior to ordering a C. difficile lab test:	
Use Recent Documentation to answer the required fields below. These are required fields and must be completed in order to sign the form and move forward to place order.	
Recent Documentation	
<div>View Stool Documentation (last 24 hrs): Stool Count 1 04/27/2017 23:00 Stool Count 1 04/27/2017 02:00 Laxatives Administered (last 48 hrs): polyethylene glycol 3350 17 g 04/27/2017 08:12 polyethylene glycol 3350 17 g 04/26/2017 08:56 C.diff Toxin Test Orders (last 7 days): None C.diff Toxin Test Results (last 30 days): None</div>	
<div><input checked="" type="radio"/> Yes <input type="radio"/> No</div>	Does the patient have clinical significant diarrhea? Defined as at least 3 liquid, watery stools within 24hr. Formed stool will not be accepted or tested unless ileus is suspected.
<div><input type="radio"/> Yes <input checked="" type="radio"/> No</div>	Have any laxatives been administered in the last 48 hours? If yes, consider cancelling order and allowing 48 hours without laxatives and reassess.
<div><input type="radio"/> Yes <input checked="" type="radio"/> No</div>	Has a C. diff test been resulted negative in the past 7 days? If yes, C. diff order is unable to be processed within 7 days of last negative test.
<div><input type="radio"/> Yes <input checked="" type="radio"/> No</div>	Has the patient had a positive C. diff test in the past 30 days? If yes, "test-of-cure" is not recommended

C. difficile testing orders



Hospital-Acquired C. difficile SIR



Summary

- Medication Management Standard MM.09.01.01
 - Element of Performance
 - 1. Leaders establish ASP as an organization priority
 - ✓ Accountability documents, budget plans, IP plans, PI plans, EHR data
 - 2. The hospital educated staff and LIPs involved in ordering, dispensing, administration, and monitoring about ASP practices
 - 3. The hospital educates patients and families regarding appropriate use of antimicrobials
 - 4. The hospital has an ASP multidisciplinary team with the following
 - ✓ ID physician, IP, pharmacist, practitioner
 - 5. The ASP program meets CDC checklist of core elements
 - 6. The ASP program uses organization-approved multidisciplinary protocols
 - ✓ Formulary restrictions, appropriate antibiotics for CAP, SSTIs, UTIs, C.difficile
 - ✓ Guidelines for adults and pediatrics
 - ✓ IV to PO conversion protocol, preauthorization for specific antibiotics, surgical prophylaxis
 - 7. The hospital collects, analyzes, and reports ASP data
 - 8. The hospital takes action on opportunities identified in its ASP

