# Antimicrobial Stewardship: Challenges & Quantifiable Metrics

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**Cancer Treatment Centers of America**

**May 25, 2017**

# Disclosures

**We have no conflicts of interest to disclose and no financial relationships relevant to this activity.**

# Learning Objectives

- Review national initiatives that directly influence the role of Antimicrobial Stewardship Programs
- Highlight common challenges observed in antimicrobial stewardship
- Identify quantifiable metrics and performance measures for ASP

# Antimicrobial Stewardship "Icebreakers"

**"Superbugs…these are our babies…now they have body piercings and anger!"**

**"Antibiotics kill bacteria, not your anxiety. Stop the 'just-in-case' indications."**

# Importance of Antimicrobial Stewardship

- **Increasing incidence of antimicrobial resistance**
  - Injudicious antibiotic use / Inappropriate antibiotic selection
  - Treatment failures and poor patient outcomes
  - Prolonged hospitalization
  - Increasing medical expenditures (use of additional medication, extra laboratory testing)

- **Stabilization of antibiotic resistance**
  - Multifactorial approach
    - Antibiotic formulary restrictions
    - Prospective audit and feedback
    - Surveillance of antibiotic utilization and resistance patterns
    - Daily interventions tailored to optimize appropriate antibiotic use

# “Mirror, Mirror on the Wall…..Who is the Best Supporter of Them All?”

IDSA FEATURES

Infectious Diseases Society of America · HIV Medicine Association · OXFORD

# Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America

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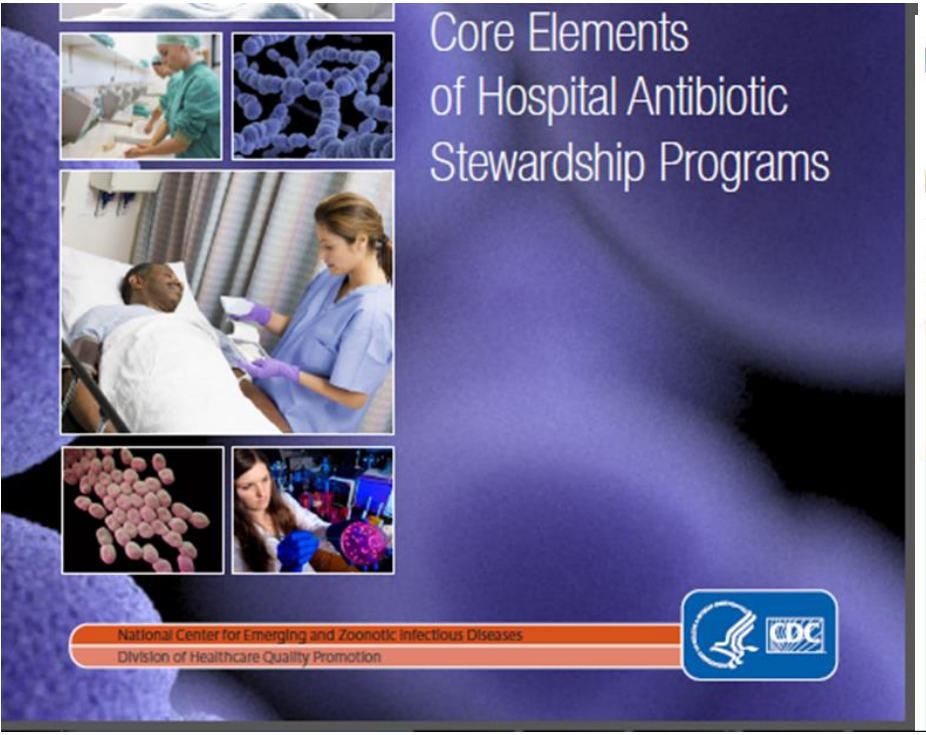
**Infectious Diseases Society of America**

**Centers for Disease Control**

**The Joint Commission (6/2016)**




The Joint Commission

• Issued June 22, 2016 •

# Prepublication Requirements

The Joint Commission has approved the following revisions for prepublication. While revised requirements are published in the semiannual updates to the print manuals (as well as in the online E-dition®), accredited organizations and paid subscribers can also view them in the monthly periodical *The Joint Commission Perspectives®*. To begin your subscription, call 877-223-6866 or visit http://www.jcrinc.com.

Joint Commission Requirement

## 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 organi-

**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


**September 2014**

- President's Executive Order and National Strategy
- PCAST Report to the President

**March 2015**

- National Action Plan for Combating Antibiotic-Resistant Bacteria (CARB)

NATIONAL ACTION PLAN FOR COMBATING ANTIBIOTIC-RESISTANT BACTERIA

MARCH 2015

THE WHITE HOUSE
WASHINGTON

# Proposed Policy Changes

- Strengthen antibiotic stewardship in inpatient, outpatient, and long-term care settings
  - **Alignment with Centers for Disease Control (CDC) Core Elements and IDSA/SHEA**
  - **Compliance with Conditions of Participation and The Joint Commission (TJC) Accreditation requirements**

- Implement annual reporting of antibiotic use in inpatient and outpatient settings and identify variations at geographic, provider, and patient levels

# Proposed Policy Changes

- Establish and improve antibiotic stewardship programs across **ALL** healthcare settings
- Reduce inappropriate antibiotic use by 50% in outpatient settings and 20% in inpatient settings
- Establish State Antibiotic Resistance (AR) Prevention (Protect) Programs in all 50 states

# Goals of Antimicrobial Stewardship

- Improve patient outcomes
- Optimize selection, dose and duration of Rx
- Reduce adverse drug events including secondary infection (e.g., *Clostridium difficile* infection)
- Reduce morbidity and mortality
- Limit emergence of antimicrobial resistance
- Reduce length of stay
- Reduce health care expenditures

# Challenges in ASP

The work to achieve success in Antimicrobial Stewardship closely parallels the storybook of…..

**"The Little Engine That Could..."**

**"When it comes to Infectious Diseases and Antibiotics, there is only do or do not, there is no try."**


ASP Misconceptions
Lack of Collaboration
Stakeholder Cooperation
Challenges
Problem Prescribers & Behaviors
Where is the 'Stamp & Seal' from Leadership?
Minimal Support / "Buy-in"

# “Are there any familiar hurdles?”

## Stakeholder Cooperation

- Internists/Hospitalists
- Intensivists
- General, advanced practitioners

## Collaboration

- Microbiology
- Pharmacy
- Physicians
- Infection Prevention

# Common Misconceptions

- If an Infectious Diseases consultant approves or uses an antibiotic, it must be appropriate
- Retrospective data collection and analysis can result in change in behavior
- The adoption of information technology (IT) will automatically make data collection, analysis and change in behavior easy
- Restricting use of certain antibiotics will reduce antibiotic misuse and overuse

# Challenges: Fact or Fiction

- Not all literature in Infectious Diseases is “black & white”
- **Everyone** is an **“Expert”** on the use of antibiotics
- Providers perceive their autonomy is compromised
- Concerns for litigation
- Obtaining “buy-in” for support of ASP
- Financial pressures that influence decision-making processes
  - Pharmaceutical Industry
  - Hospitals (Budget)
  - Payer sources
    - Insurance industries
    - Centers for Medicare & Medicaid Services [CMS])
  - Patients/Support network

# Physician Barriers

**"Antibiotics are among the most potent of all anxiolytics – for prescribers."**

- Physician accountability & acknowledgement of need for improvement
- Misperceptions
- Knowledge gaps in the appropriate use of antimicrobial agents
- Lack of standardized, risk-adjusted measures
- Adaptive/behavioral changes needed to modify prescribing practices

# “Pearls of Wisdom” for the Problem Prescriber

| | |
|---|---|
| **Map-Out Your Approach** | • Timing of discussion & recommendations is prudent<br>• Be strategic and pick your battles |
| **Do Your Homework** | • Research & gather as much “valid” data as possible<br>• Understand the provider’s practice & patient population |
| **Do Not “Go Postal!!”** | • Do not initiate or engage in “heat-of-the-moment” battles<br>• Accept a “stewardship-appropriate” compromise |

# Modifying Prescribing Behaviors

- Involvement of senior physician leadership is critical
  - Administrative & Clinical
- Continue to share your stewardship message and education points with non-ID providers/clinicians
- ID should not be excluded from stewardship process
- Understand local culture and patient population

“Fever is not a sign of ‘Vosyn’ deficiency.”

**Are there any solutions?**

# IDSA/SHEA, CDC, TJC Guidelines

- **A multidisciplinary ASP team infrastructure**
  - **ID physician and Pharmacist** and other key stakeholders as determined by the institution
- **Incorporate Core Strategies**
  - Prospective audit with intervention and feedback
  - Formulary restriction and preauthorization
- **Additional approaches to stewardship**
  - Education
  - Guidelines and clinical pathways
  - Order forms
  - **De-escalation**
  - Dose optimization
  - IV to PO conversion

# Antibiotic De-escalation

## Advantages

- Allows initial use of broad-spectrum therapy
- Narrows spectrum while maintaining efficacy
- May influence future prescribing behavior
- Decreases inappropriate antibiotic use
- Reduces adverse events
- Cost savings

## Disadvantages

- Prescribers may be reluctant to change therapy if the patient is doing well
- If not done correctly, may narrow therapy “inappropriately”

# De-escalation "Myths"

**Common myths that negatively impact appropriate de-escalation:**

- Lack of conclusive microbiology results
  - Continued use of broad-spectrum antimicrobial therapy
- Diagnostic uncertainty
  - Treatment of fever, colonization and/or contamination
- Insecurity
  - Treatment of noninfectious syndrome associated with fever
- Duration of therapy exceeds evidence-based recommendations

# SERMC-CTCA Antimicrobial Stewardship Program

"Antimicrobial stewardship is a team game with the patient at the center, and it's our teamwork that makes the dream work."

Source:

# SOUTHEASTERN HOSPITAL
# ANTIMICROBIAL STEWARDSHIP COMMITTEE CHARTER

Cancer Treatment Centers of America

## MISSION

Antimicrobial stewardship can be defined as a continuous, systematic effort to optimize the use of antibiotic agents within a health care organization.

The mission of the Southeastern Regional Medical Center (SERMC) Antimicrobial Stewardship Committee is including, but not limited to: reducing inappropriate antimicrobial use, improving patient care outcomes and mitigating adverse consequences of antimicrobial therapy (i.e. antimicrobial resistance, preventable patient harm and unnecessary expenditure associated with medication expenses and drug-resistant infections).

*"The microbes that are educated and a host of penicillin-fast organisms are bred out…In such cases, the thoughtless person playing around with penicillin is morally responsible for the death of the man who finally succumbs to infection with the penicillin-resistant organism. I hope this evil can be averted."*

*-Alexander Fleming*



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# SERMC ANTIMICROBIAL STEWARSHIP COMMITTEE

| VOTING MEMBERS<br>Task Force Advisors |
| --- |
| Chair - Infectious Disease Physician – Dr. Charles Onunwko (August 2016) |
| Infectious Disease/Critical Care Clinical Pharmacist –<br>Erika Ingram, Pharm.D, BCPS |
| ASP Pharmacist – Tamunosa Abbey, Pharm.D, BCPS |
| Critical Care Medicine – Dr. Carter Co |
| Internal Medicine Physician – Dr. Ankur Patel |
| Internal Medicine Physician – Dr. Jude Emokpare |
| General Surgery Physician – Dr. Gary Bernstein |
| Director of Pathology – Dr. Judy Sequeira (Ad-hoc Member) |

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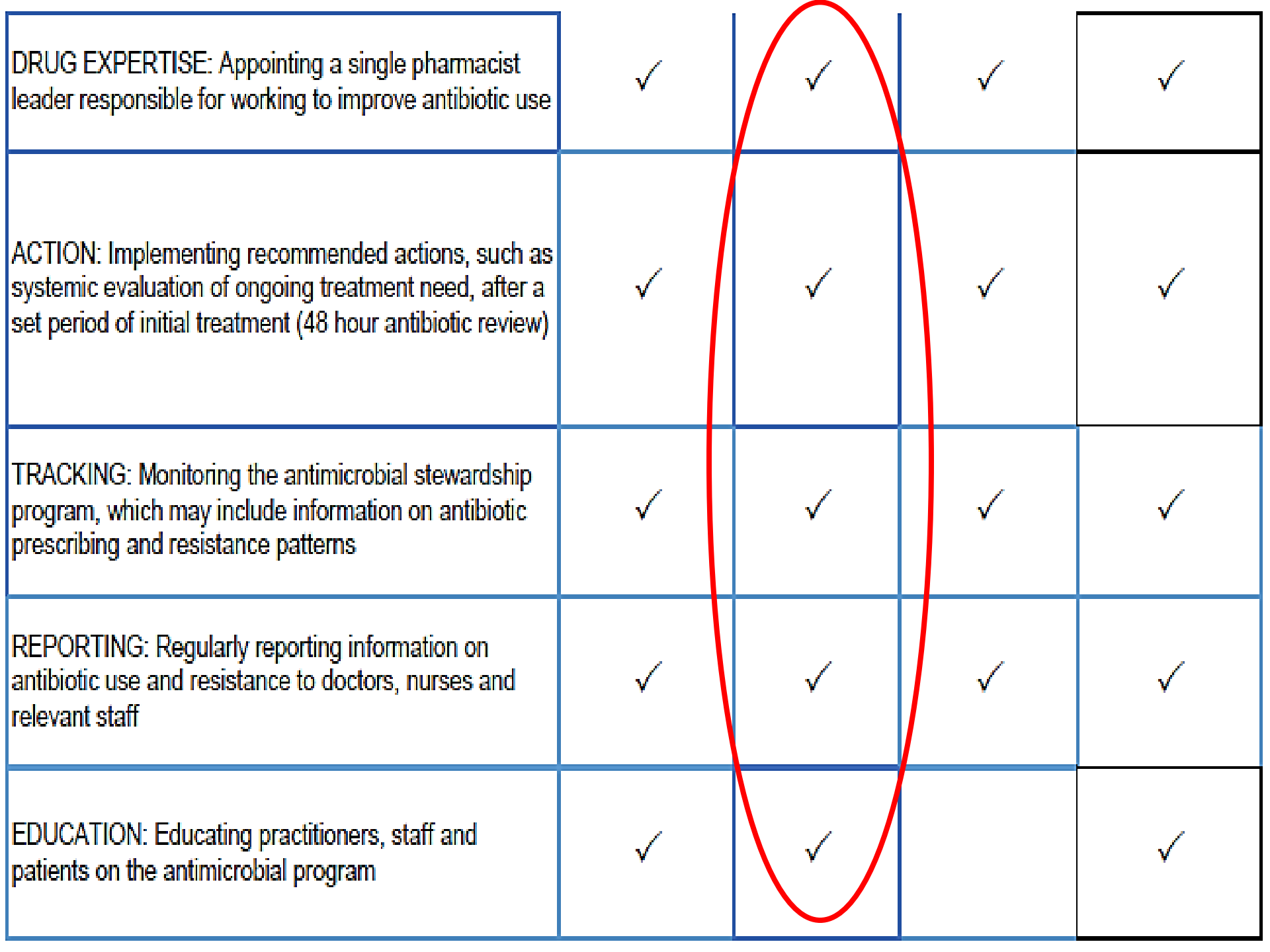
# CTCA Enterprise Antimicrobial Stewardship Dashboard
# +
# The Joint Commission Standards

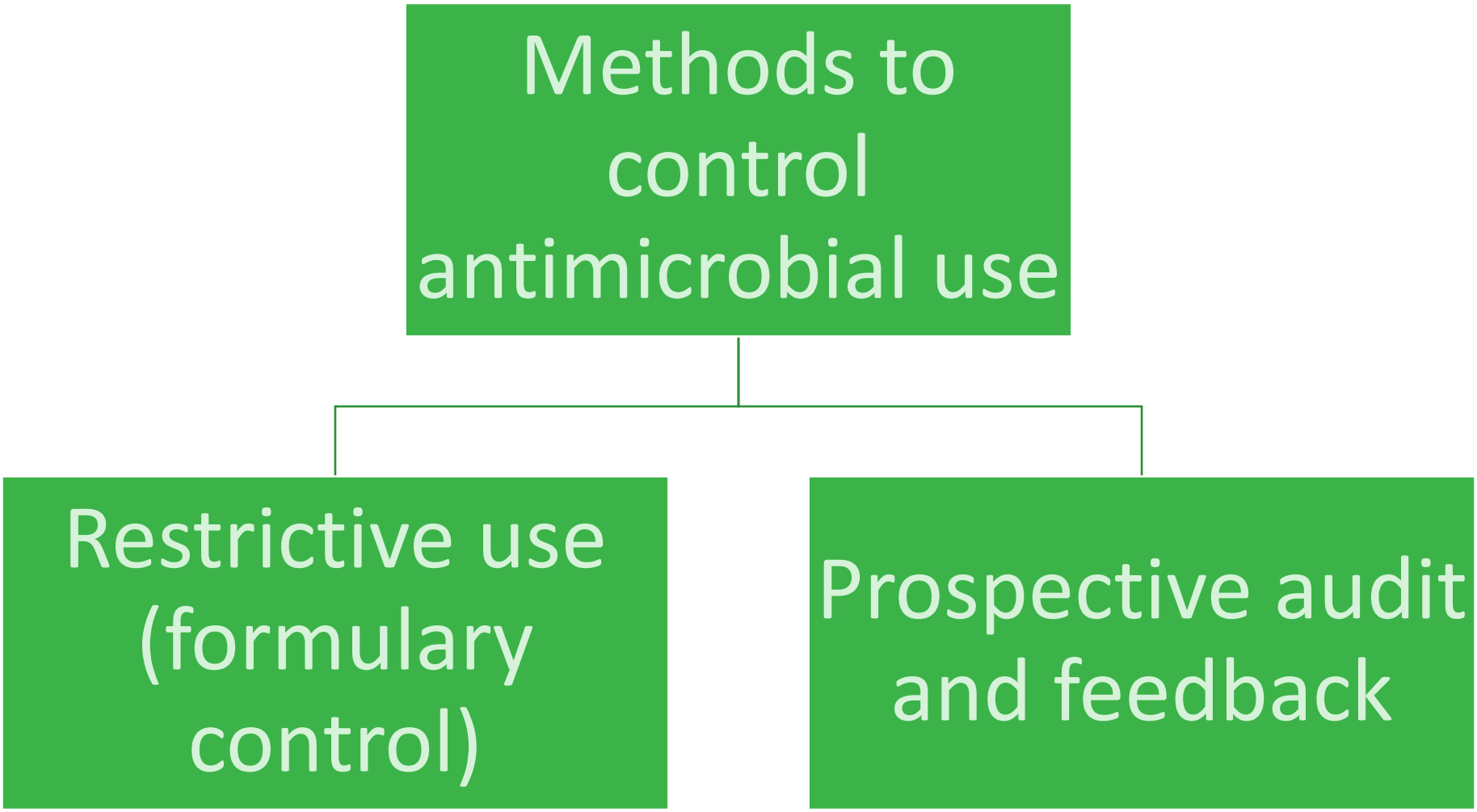
Source:

**The Joint Commission**
**New Antimicrobial Stewardship Standard**

| | ¥ = Documentation required | ERMC | SERMC | MRMC | SRMC |
|---|---|---|---|---|---|
| | **Standard MM.09.01.01**<br>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<br><br>*Note:* Examples of leadership commitment to an antimicrobial stewardship program are as follows:<br>• Accountability documents<br>• Budget plans<br>• Infection prevention plans<br>• Performance improvement plans<br>• Strategic plans<br>• Using the electronic health | ✓ | ✓ | ✓ | ✓ |


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 (48 hour antibiotic review)
TRACKING: Monitoring the antimicrobial stewardship program, which may include information on antibiotic prescribing and resistance patterns
REPORTING: Regularly reporting information on antibiotic use and resistance to doctors, nurses and relevant staff
EDUCATION: Educating practitioners, staff and patients on the antimicrobial program

# Methods to Control Antimicrobial Use




Dellit TH et al. *Clin Infect Dis*. 2007; 44:159-77.

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# SERMC - Formulary Restriction and Preauthorization

- Ceftaroline
- Ceftazidime-avibactam
- Ceftolozane-tazobactam
- Dalbavancin
- Daptomycin
- Ertapenem
- Linezolid
- Tigecycline

Source:

# ERTAPENEM (INVANZ®)

SERMC Antibiotic Utilization Protocol, April 2015

## RESTRICTION STATUS

| | |
|---|---|
| **Ertapenem requires evaluation of appropriate use upon verification of the first dose. A review for continuation of therapy will be conducted by the ID Pharmacist or designee within 24 to 72 hours of initial dose administration.** | Charles Onunkwo, MD, Infectious Disease Medicine<br>Erika Ingram, Pharm.D, BCPS, ID/CC Clinical Pharmacist<br>**Designees:**<br>Tamunosa Abbey, Pharm.D, ASP Pharmacist<br>Ankur Patel, MD, ASP Champion/Internal Medicine<br>Jude Emokpare, MD, ASP Champion/Internal Medicine<br>Carter Co, MD, ASP Champion/Critical Care Medicine<br>Gary Bernstein, MD, ASP Champion/General Surgery |

## UTILIZATION CRITERIA

| | |
|---|---|
| **OVERVIEW** | Ertapenem is carbapenem antibiotic with activity against many aerobic and anaerobic gram-positive and gram-negative pathogens, including extended-spectrum beta-lactamse (ESBLs). There is no clinically significant activity against *Pseudomonas spp.*, *Acinetobacter spp.*, and *Enterococcus spp.* |
| **APPROPRIATE USE** | ☐ Mild to moderate intra-abdominal infections including: diverticulitis, biliary tract infections and secondary peritonitis.<br>☐ Moderate diabetic foot infections (DFI)<br>☐ Infections secondary to AmpC and extended-spectrum beta-lactamase (ESBL) - producing organisms susceptible to ertapenem.<br>☐ Complicated urinary tract infections caused by ESBL-producing organisms<br>☐ Other: _____ |

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## INAPPROPRIATE USE

- ☐ **Not for use in Urgent Care**
- ☐ Initial therapy for the following **complicated** infections: intra-abdominal, skin and skin structure infections and /or urinary tract.
- ☐ Initial treatment of community-acquired bacterial pneumonia.
- ☐ Empiric therapy **OR** culture-documented infections secondary to *Acinetobacter spp.*, *Pseudomonas spp.* and *Enterococcus spp.*
- ☐ Treatment of Asymptomatic Bacteruria (ASB) or genitourinary colonization secondary to Amp-C and ESBL-producing organisms
- ☐ Surgical prophylaxis (**excluding** colorectal procedures)
- ☐ Other: _____

## DOSING

| All Indications | CrCl (mL/min) | | | |
|---|---|---|---|---|
| | **> 30** | **< 30** | **CRRT** | **IHD** |
| | 1gm IV q24h | 500mg IV q24h | 1gm IV q24h | 500mg IV q24h |

# SERMC - Formulary Restriction and Preauthorization

Cancer Treatment Centers of America

## ERTAPENEM (INVANZ®)

**FOR PHARMACY USE ONLY:**

**Patient name:** _____ **MRN#:** _____

**Appropriate therapy:**

☐ **YES**

Duration of therapy: _____

☐ **NO**

Alternate recommendation: Drug/Dose: _____ Duration: _____

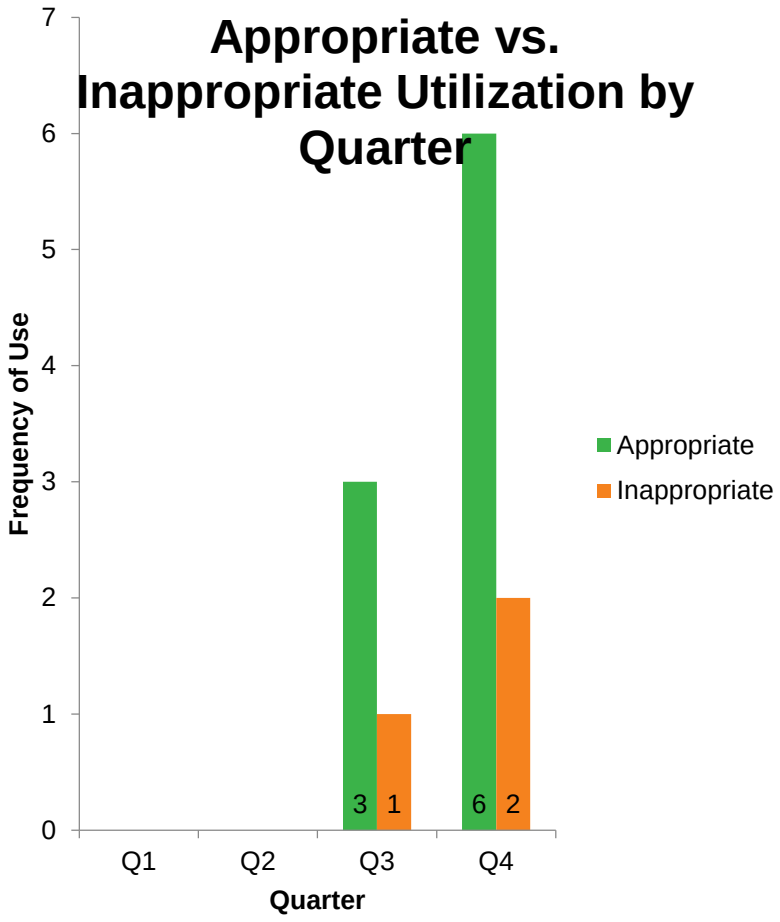
☐ Approved:

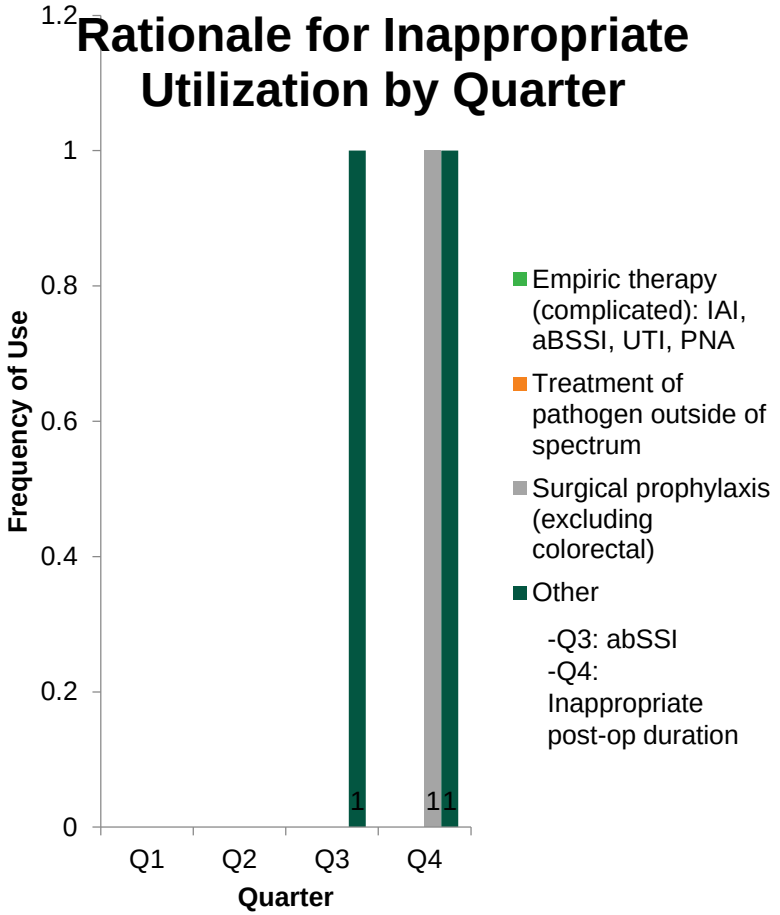
☐ Declined

**Drug utilization evaluated by:** _____ **Date:** _____

**Provider Signature:** _____ **Date:** _____

# ERTAPENEM 2015

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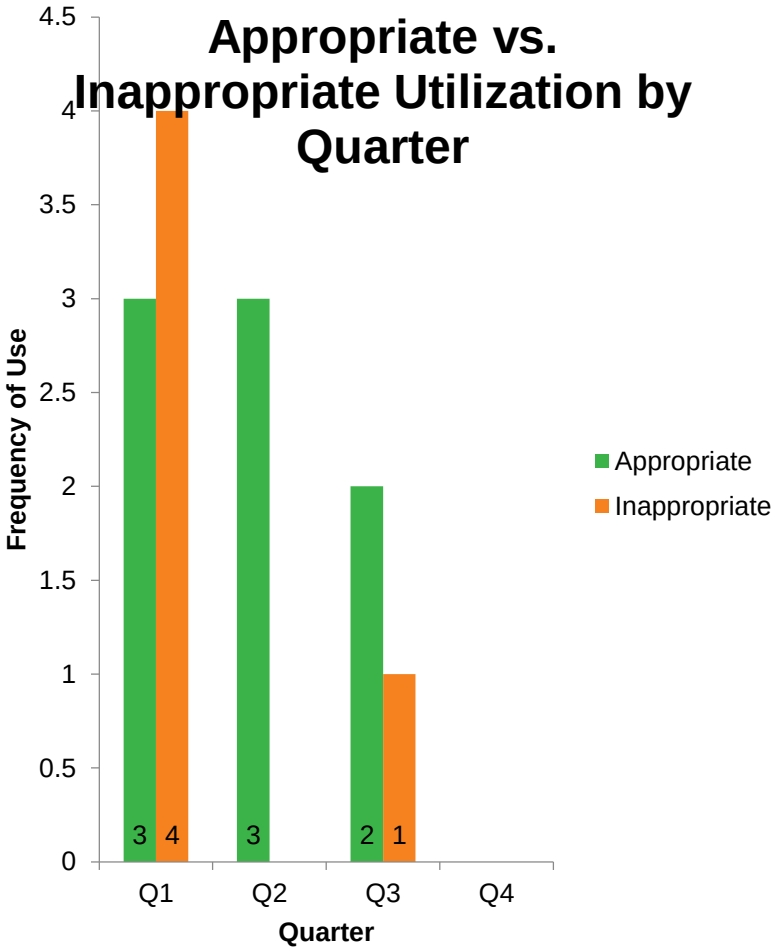
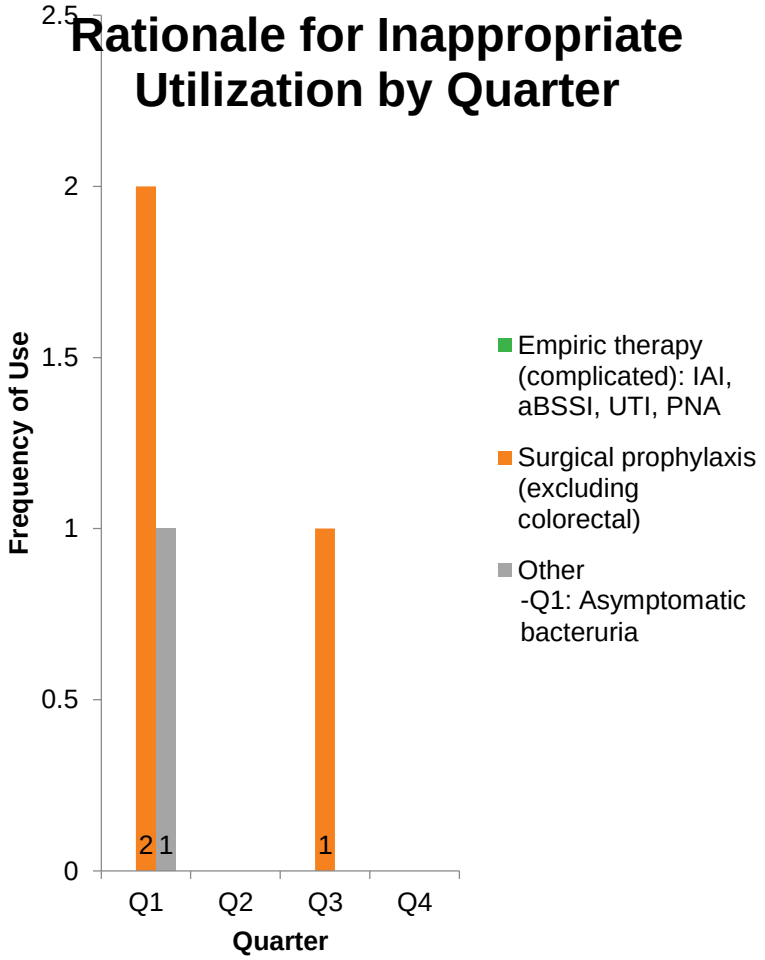
# ERTAPENEM 2016

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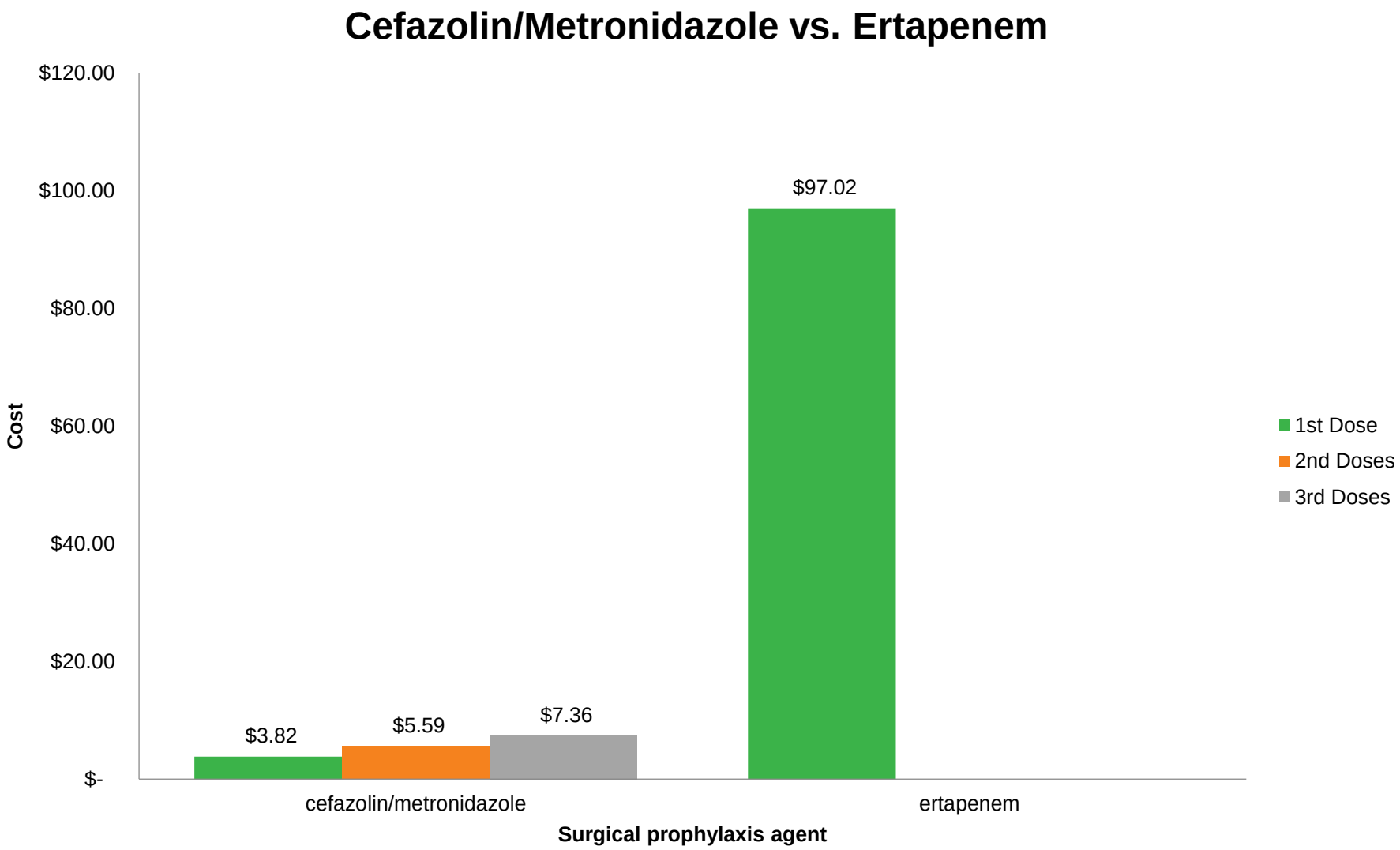
# SURGICAL ANTIBIOTIC PROPHYLAXIS: COST ANALYSIS

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# SERMC Antibiotic Stewardship Initiative

| CORE ELEMENTS | STATUS | | ACTION PLAN |
|---|---|---|---|
| **BROAD INTERVENTIONS** | ▪ Chart review of appropriate use 48-hrs post initiation<br>▪ Pre-authorization (by MD/PharmD) for specific abx agents<br>▪ MD/PharmD review of courses of abx therapy (prospective audit with feedback) | ☑ Yes<br>☑ Yes<br>☑ Yes | -Established chart review process for appropriate abx use at ~48-72 hrs post-initiation. All abx reports print daily (Pyxis Reports) for all inpatient areas. Vigilanz (clinical surveillance sytem) for tracking different entities of ASP<br><br>- Eight abx utilization protocols developed for pre-authorization process for specific abx. <Continuous><br><br>- Dr. Charles Onunkwo (SERMC Infectious Disease Physician) will implement process of prospective audit with feedback will be implemented October 2016 (tentative). |

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# ASP Initiatives: Daily Antimicrobial Report (Inpatient)

Cancer Treatment Centers of America

Winning the fight against cancer, every day.®

## Inpatient Census Report

SERMC

As on 9/21/2016 8:33:34 AM

Southeastern Regional Medical Center
600 Celebrate Life Parkway
Newnan, GA 30265
Phone: (770) 400-6000

| Room | Patient | DOB | Age | Sex | Service | Primary Diagnosis | Admit Date | LOS/Visit | Code Status | Oncologist | Hospitalist |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 201-0 | SILVEY, MARSHALL 90012037 | 2/12/1961 | 55y | M | Inpatient | Adenocarcinoma of sigmoid colon | 9/14/2016 | 8/900113821 | Full Code | Chowdhury, Shahin | Onasile, Emmanuel |
| 202-0 | CLICK, MARY A 90005385 | 5/8/1979 | 37y | F | Inpatient | Prolonged QT interval | 9/20/2016 | 2/900114417 | Full Code | Cavanaugh, Sean; Pabbathi, Haritha | Onasile, Emmanuel |
| 203-0 | BENT CAMPBELL, NADINE 90014711 | 1/8/1986 | 30y | F | Inpatient | Metastatic adenocarcinoma to liver | 9/19/2016 | 3/900114372 | Full Code | Meiri, Eyal | Castro-Revoredo, Iris |
| 204-0 | LUCAS, WILLIAM 90015817 | 7/6/1965 | 51y | M | Inpatient | Adenocarcinoma of esophagus | 9/15/2016 | 7/900113887 | Full Code | Meiri, Eyal; Shakibnia, Lily | Cushing, Michael |
| 205-0 | CIVERS, DEBORAH 90014246 | 10/7/1956 | 59y | F | Inpatient | Adenocarcinoma of colon | 9/17/2016 | 5/900114211 | Full Code | Patel, Atulkumar | Hardy, Leanthony |
| 206-0 | HAND, CHRISTINA 90013903 | 11/29/1973 | 42y | F | Inpatient | Inflammatory carcinoma of breast | 9/16/2016 | 6/900114180 | Full Code | Hyde, Christian; Panicker, Ritwick | Onasile, Emmanuel |
| 207-0 | OCHOA, WILMA 90013349 | 10/5/1961 | 54y | F | Observation | Pain from bone metastases | 9/20/2016 | 2/900114633 | Full Code | Cavanaugh, Sean | Onasile, Emmanuel |
| 208-0 | MASTRARRIGO, GERRARD 90005743 | 1/20/1966 | 50y | M | Observation | Small bowel obstruction | 9/20/2016 | 2/900114613 | Full Code | Meiri, Eyal | Onasile, Emmanuel |
| 209-0 | LOVETT, MONICA 90001652 | 4/13/1976 | 40y | F | Inpatient | Vaginal spotting | 9/7/2016 | 15/900112812 | Full Code | Gullett, Norleena; Pabbathi, Haritha | Onasile, Emmanuel |



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*Clinical Infectious Diseases*

MAJOR ARTICLE

# What Is the More Effective Antibiotic Stewardship Intervention: Preprescription Authorization or Postprescription Review With Feedback?

**Pranita D. Tamma,[1] Edina Avdic,[2] John F. Keenan,[3] Yuan Zhao,[4] Gobind Anand,[5] James Cooper,[6] Rebecca Dezube,[7] Steven Hsu,[8] and Sara E. Cosgrove[9]**

[1]Division of Infectious Diseases, Department of Pediatrics, Johns Hopkins University School of Medicine, and [2]Department of Pharmacy, Johns Hopkins Hospital, Baltimore, Maryland; [3]Department of Family Medicine, Lynchburg General and Virginia Baptist Hospital, Lynchburg; [4]Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland; [5]Division of Gastroenterology, Department of Medicine, University of California, San Diego; [6]Division of Hematology, Department of Medicine, National Institutes of Health; and Divisions of [7]Pulmonary and Critical Care Medicine, [8]Cardiology, and [9]Infectious Diseases, Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland

***Background.*** The optimal approach to conducting antibiotic stewardship interventions has not been defined. We compared days of antibiotic therapy (DOT) using preprescription authorization (PPA) vs postprescription review with feedback (PPRF) strategies.

***Methods.*** A quasi-experimental, crossover trial comparing PPA and PPRF for adult inpatients prescribed any antibiotic was conducted. For the first 4 months, 2 medicine teams were assigned to the PPA arm and the other 2 teams to the PPRF arm. The teams were then assigned to the alternate arm for an additional 4 months. Appropriateness of antibiotic use was adjudicated by at least 2 infectious diseases–trained clinicians and according to institutional guidelines.

***Results.*** There were 2686 and 2693 patients admitted to the PPA and PPRF groups, with 29% and 27% of patients prescribed antibiotics, respectively. Initially, antibiotic DOTs remained relatively unchanged in the PPA arm. When changed to the PPRF arm, antibiotic use decreased (–2.45 DOT per 1000 patient-days [PD]). In the initial PPRF arm, antibiotic use decreased (slope of –5.73 DOT per 1000 PD) but remained constant when changed to the PPA arm. Median patient DOTs in the PPA and PPRF arms were 8 and 6 DOT per 1000 PD, respectively ($P = .03$). Antibiotic therapy was guideline-noncompliant in 34% and 41% of patients on days 1 and 3 in the PPA group ($P < .01$) and in 57% and 36% of patients on days 1 and 3 in the PPRF group ($P = .03$).

***Conclusions.*** PPRF may have more of an impact on decreasing antibiotic DOTs compared with PPA. This information may be useful for institutions without sufficient resources to incorporate both stewardship approaches.

# Antimicrobial Stewardship: Performance & Quantitative Measures

"The most expensive antibiotic is the one that does not work."

# ASP Framework: Metrics

## National Quality Forum

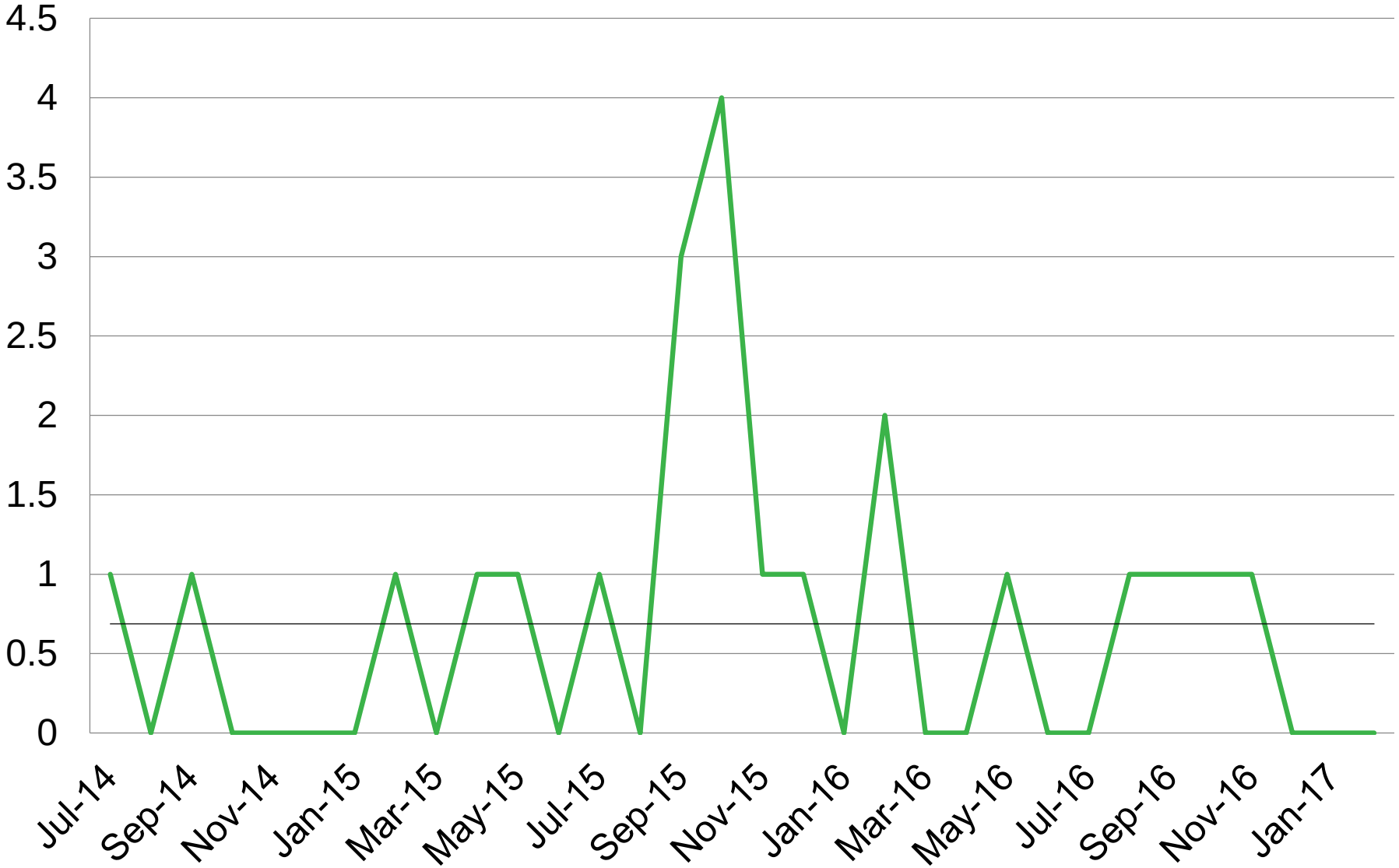
| Measurement Area | Measure |
|---|---|
| Antibiotic consumption | • Days of therapy (DOT) per 1,000 patient days—overall and for specific agents or groups of agents<br>• Defined daily dose (DDD) per 1,000 patient days (if DOT not available)<br>• Standardized Antibiotic Administration Ratio* |
| Process measures | • Provision of indication with each antibiotic start<br>• Percentage of cases where therapy is appropriate (especially for serious infections, such as sepsis)<br>• Appropriate Treatment of Methicillin-Sensitive Staphylococcus aureus (MSSA) Bacteremia<br>• Frequency at which de-escalation occurs<br>• Timely cessation of antibiotics given for surgical prophylaxis<br>• Antibiotics not prescribed to treat asymptomatic bacteria<br>• Appropriate cultures obtained before starting antibiotics<br>• Adherence to hospital-specific guidelines<br>• Acceptance of ASP recommendations<br>• Frequency of performance of antibiotic time outs or reviews<br>• Timely administration of appropriate antibiotics in cases of suspected sepsis |

# ASP Framework: Metrics

## National Quality Forum

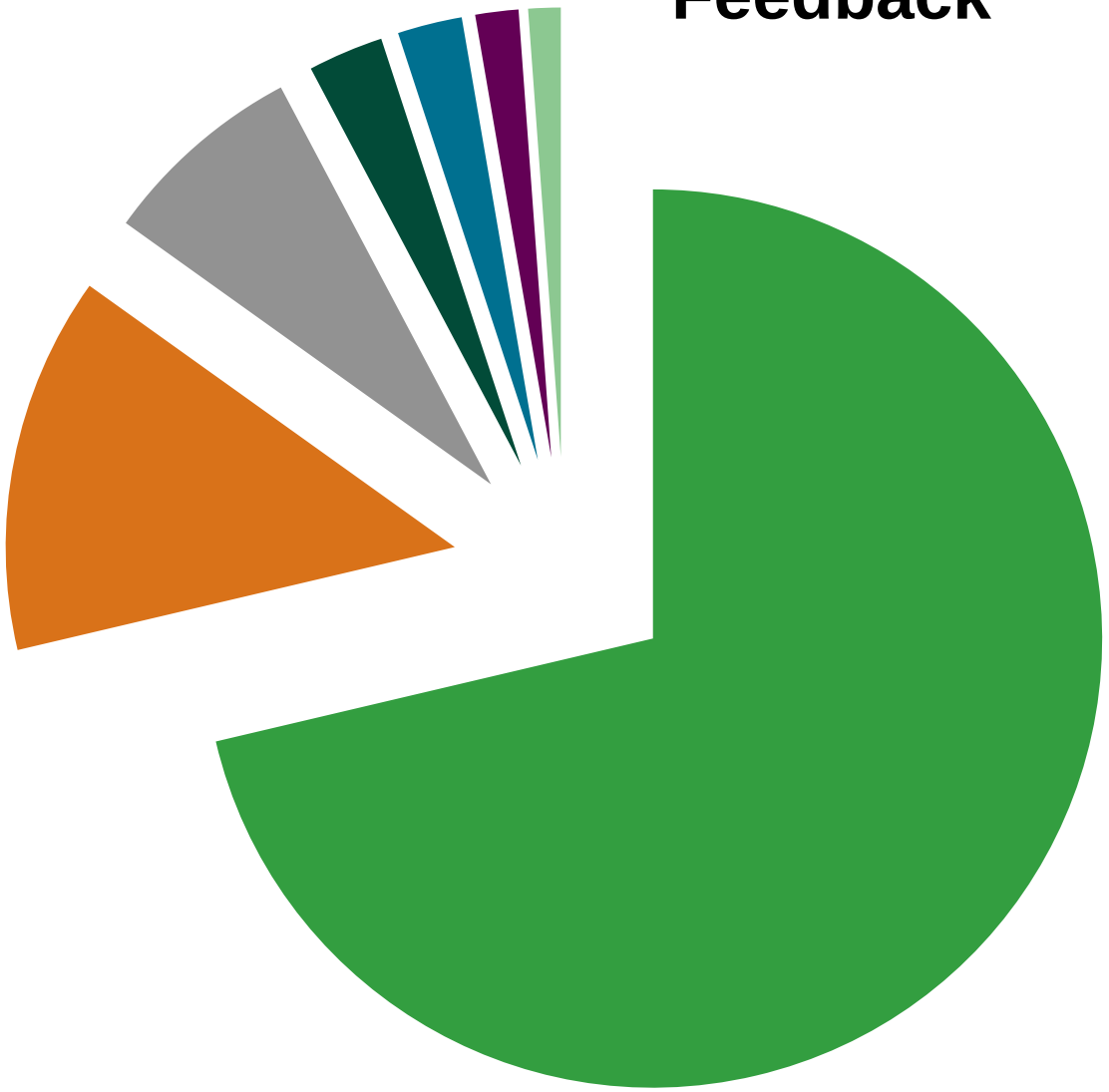
| Measurement Area | Measure |
|---|---|
| Outcome measures | • Length of stay<br>• Cure of infection<br>• Risk-adjusted mortality<br>• Hospital readmissions for select infections<br>• Hospital-onset C. difficile infections*<br>• Adverse drug reactions (number/percentage/rate)<br>• Antimicrobial resistance- focusing on hospital onset cases would most likely best reflect the impact of ASPs<br>• Provider-level measures if available (e.g., treatment of *S. aureus* and bloodstream infections) |
| Financial | • Antibiotic cost per patient day<br>• Antibiotic cost per admission<br>• Total hospital cost per admission |

# SERMC-CTCA Number of HO-CDAD Cases
# July 2014 - Feb 2017




® 2017 Rising Tide

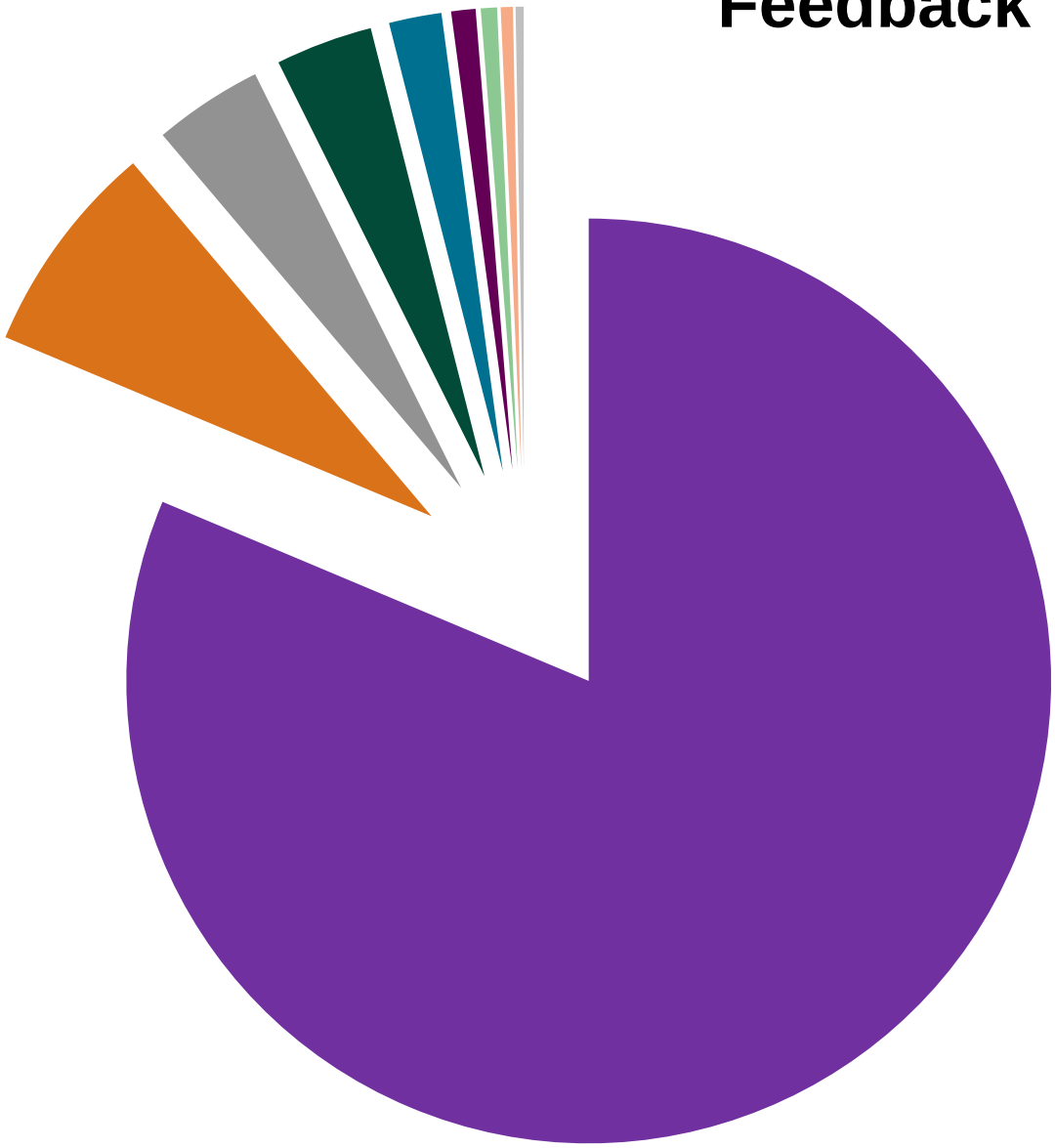
# 2016 – October – Prospective Audit with Feedback



- ASP Reviews Total
- Surgical Prophylaxis
- Discontinue antibiotics
- Establish Duration of Therapy
- Modify Abx & Discharge Counseling
- Add abx therapy & Lab analysis
- Dose optimize / Dose adj. / New ID consult

Source:

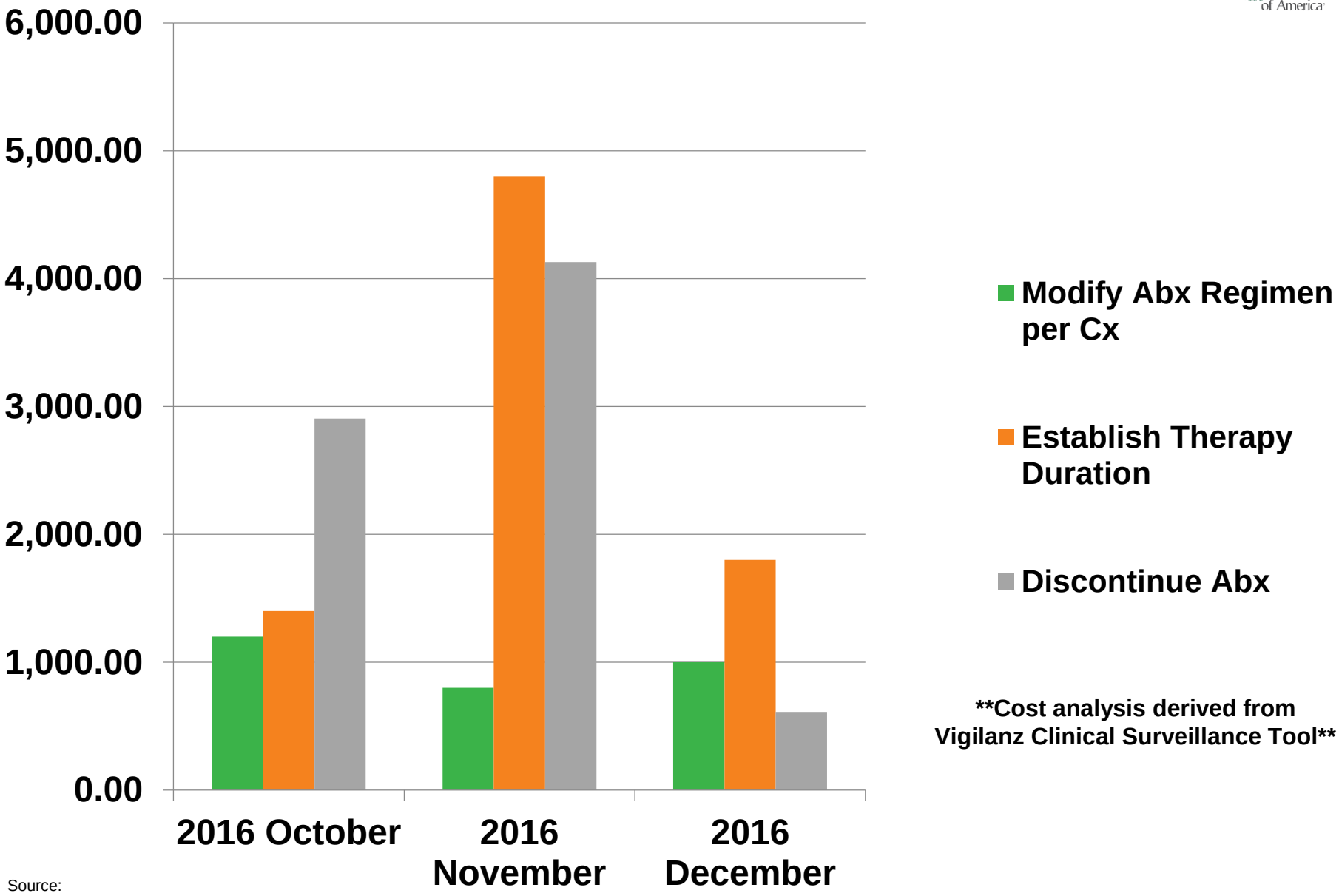
# 2016 – November – Prospective Audit with Feedback



- ASP Reviews
- Surgical Prophylaxis
- Discontinue antibiotics
- Establish Duration of Therapy
- Discharge Counseling
- IV to PO Modification
- Modify abx / New ID consult / Lab analysis
- De-escalate abx / Add abx coverage
- Dose optimization / BBI regimen

Source:

# Antimicrobial Stewardship Potential Cost Savings




**Cost analysis derived from Vigilanz Clinical Surveillance Tool**

Source:

# Conclusion

- Antimicrobial resistance is a significant public health and patient safety concern
- Highest levels of government officials are highlighting antimicrobial stewardship and efforts to decrease resistance
- TJC and CMS are developing guidance for accreditation based on an effective ASP, including publicly reportable measures
- All stakeholders should be engaged in antimicrobial stewardship and across the continuum of care.

# Thank You!

"To learn how to use antibiotics, one must first learn how not to use antibiotics."

"Mirror, mirror on the wall. Do I need antibiotics at all?"


Asymptomatic Bacteriuria: "Symptom free pee: Let it be"

"If we use antibiotics when not needed, we may not have them when they are most needed."

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