Leadership Engagement in Antimicrobial Stewardship

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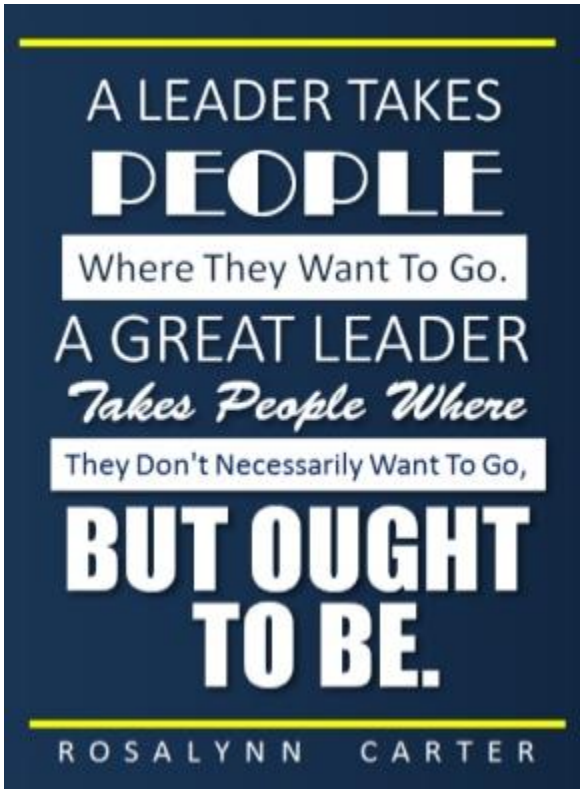
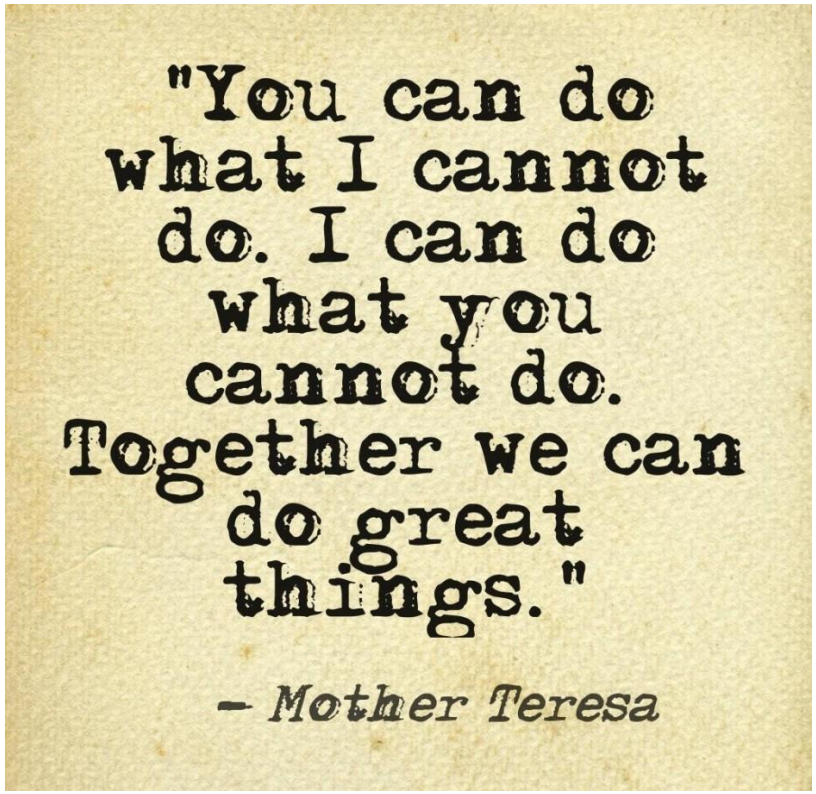
Objectives

- Define the requirements for antimicrobial stewardship (AMS) set forth by government and regulatory agencies.
- Design a process for implementing an antimicrobial stewardship program (ASP) in an acute care hospital or health system.

Why Leadership is Important

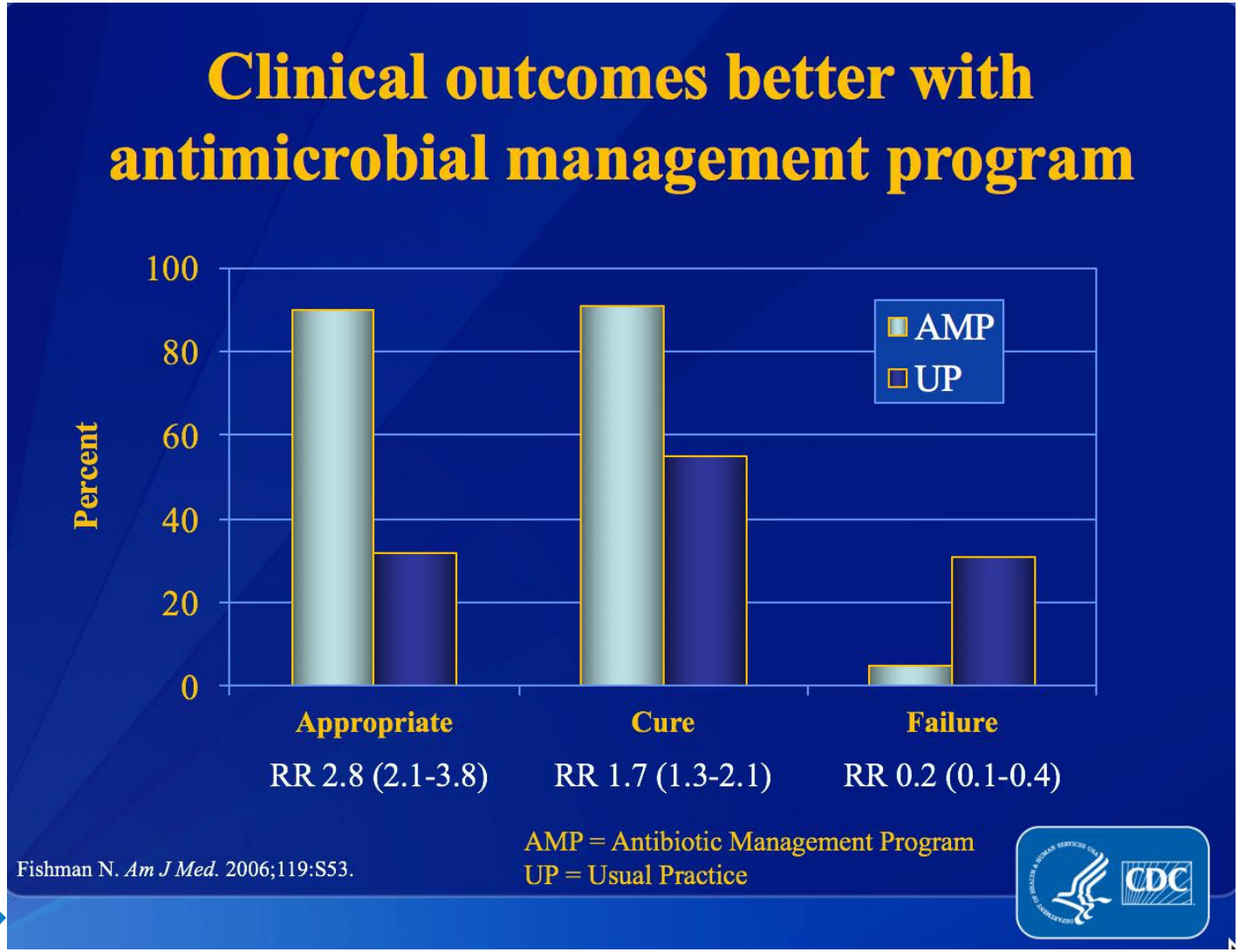




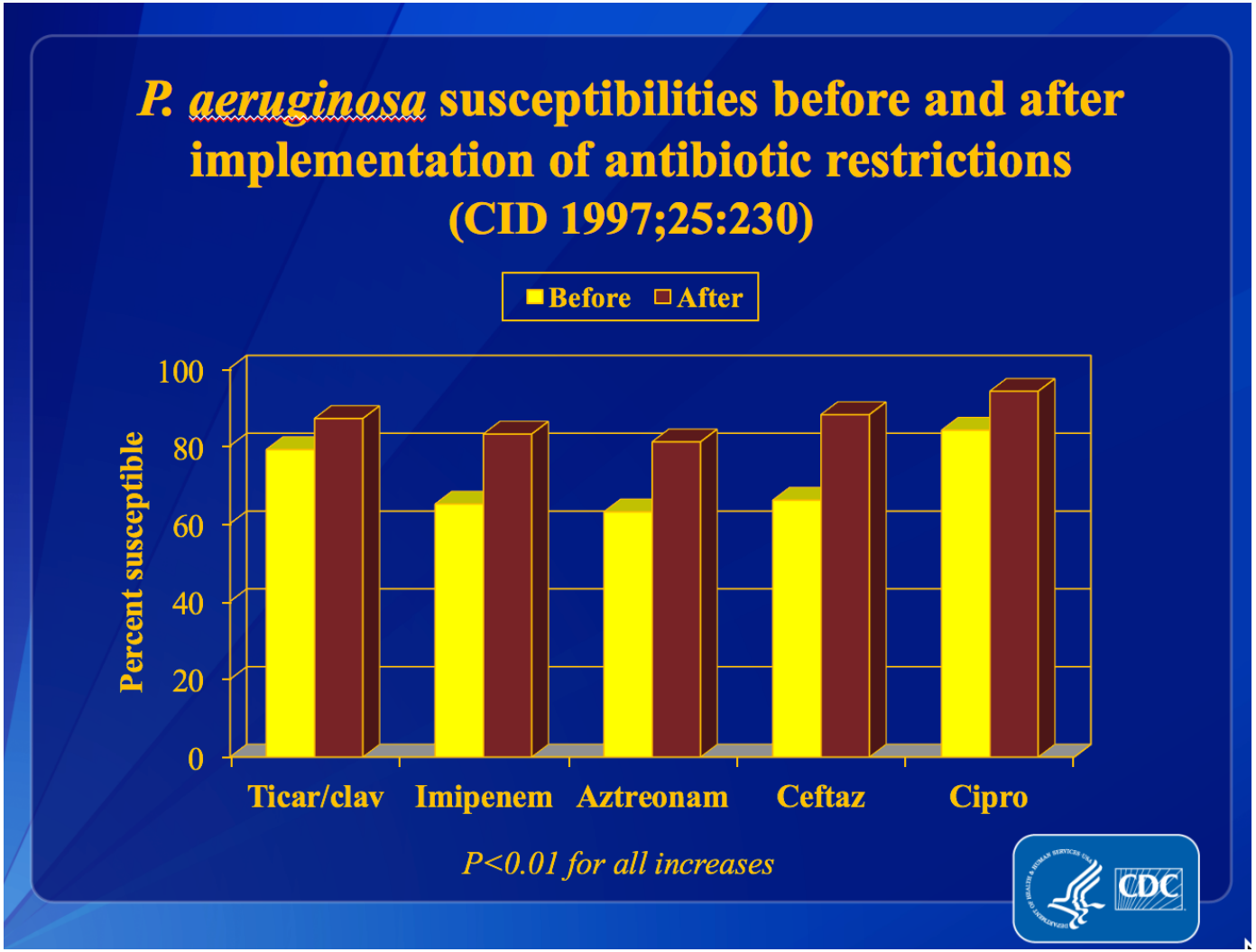
Why AMS is Important

- Indiscriminant use of antimicrobials can lead to:
  - Increased morbidity, mortality, LOS,
  - Microbial resistance
  - Adverse events - *C. difficile* infections and complications
  - Increased direct and indirect cost of care.
- CMS: Infection Control standards and Conditions of Participation (including Critical Access Hospitals)
- Joint Commission: standards requiring a program at all levels of care, including Hospitals, Critical Access Hospitals (CAH), Ambulatory Health Care, Nursing Home, Office-based Surgery practices

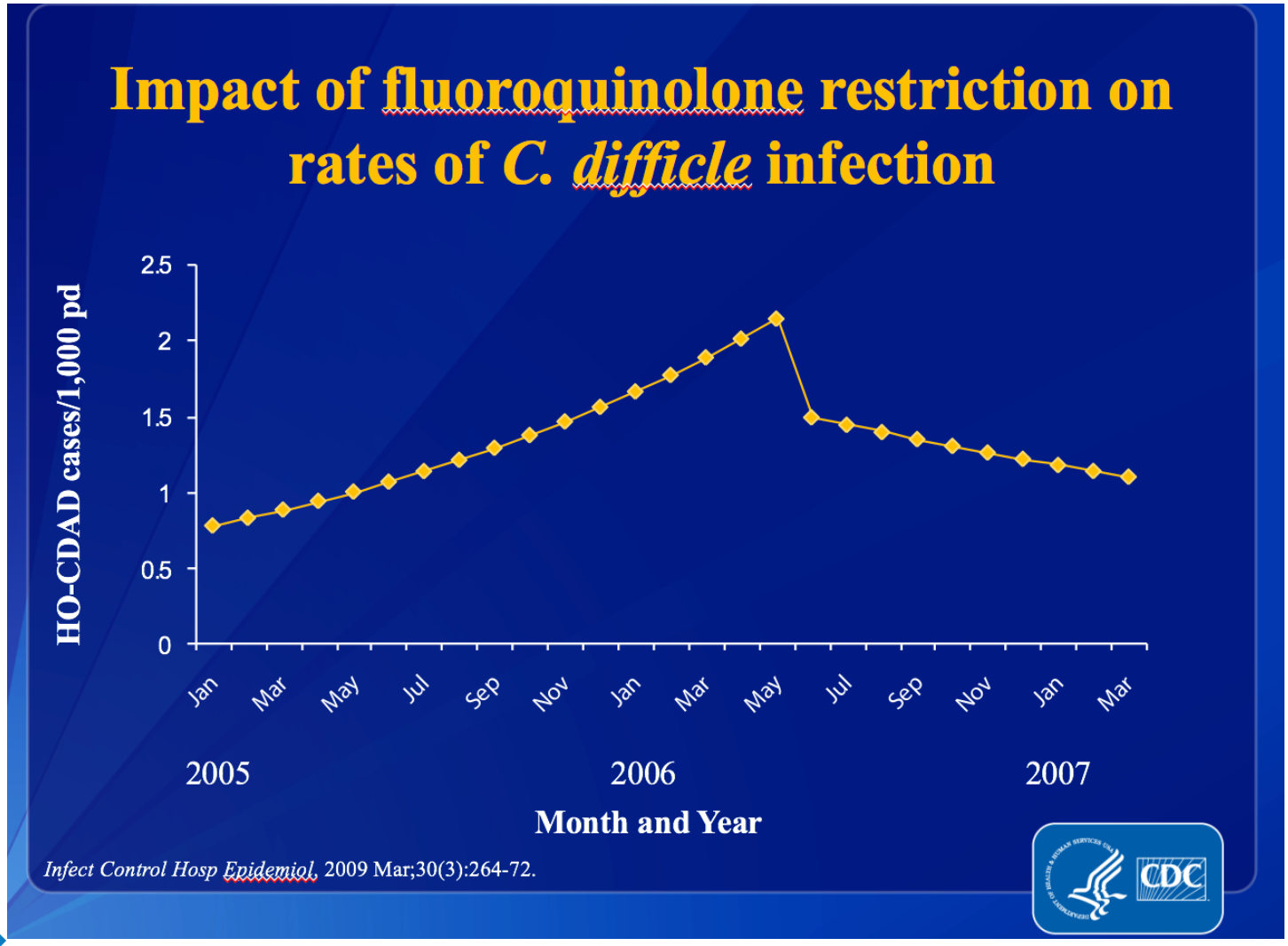
ASPs Improve Outcomes



ASPs Reduce Resistance



ASPs Reduce Adverse Events



Regulatory Expectations

- *Leadership Engagement in Antimicrobial Stewardship*

Joint Commission 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:* [as provided by Joint Commission]

Compliance	Best Practice
Accountability documents	Using the electronic health record to collect antimicrobial stewardship data
Budget plans	
Infection prevention plans	
Performance improvement plans	
Strategic plans	

Joint Commission MM.09.01.01, cont'd

5. The hospital's antimicrobial stewardship program includes the following core elements:

Core Element	Compliance
Leadership commitment: Dedicating necessary human, financial, and information technology resources.	Subjective Attestation Form
Accountability: Single leader responsible for program outcomes.	Each hospital will identify one physician leader
Drug expertise: Appointing a single pharmacist leader responsible for working to improve antibiotic use.	Each hospital will identify one pharmacist (PSI education program)
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).	Use of common policies Collaboration with nursing and medicine

Joint Commission MM.09.01.01, cont'd 2

5. The hospital's antimicrobial stewardship program includes the following core elements:

Core Element	Compliance
Tracking: Monitoring the antimicrobial stewardship program, which may include information on antibiotic prescribing and resistance patterns.	• Explore current capabilities • Consider decision support software • PSI Benchmarking and RxMediTrend • Hospital Antibiograms
Reporting: Regularly reporting information on the antimicrobial stewardship program, which may include information on antibiotic use and resistance, to doctors, nurses, and relevant staff.	• Report above tracking elements to local P&T and system AMS • PSI requiring two elements
Education: Educating practitioners, staff, and patients on the antimicrobial program, which may include information about resistance and optimal prescribing.	Duplicated from #2 and #3

CMS Condition §482.42

Compliance with the Joint Commission standards will likely meet the CMS Conditions of Participation.

§ 482.42(b)(1) Leader of the Antibiotic Stewardship Program

Requires the hospital, with the recommendations of the medical staff leadership and pharmacy leadership, to designate an individual, who is qualified through education, training, or experience in infectious diseases and/or antibiotic stewardship, as the leader of the antibiotic stewardship program. Antibiotic stewardship programs are led by physicians and pharmacists who have direct knowledge and experience with antibiotic prescribing.

CMS Condition §482.42, cont'd

Compliance with the Joint Commission standards will likely meet the CMS Conditions of Participation.

482.42(c)(1) The Governing Body

Greater specificity with respect to the responsibilities of hospital leadership at the governing body level.

(i) the governing body ensure that systems are in place and are operational for the tracking of all infection surveillance, prevention, and control, and antibiotic use activities, in order to demonstrate the implementation, success, and sustainability of such activities.

(ii) that the governing body ensure that all HAIs and other infectious diseases identified by the infection prevention and control program as well as antibiotic use issues identified by the antibiotic stewardship program are addressed in collaboration with hospital QAPI leadership.

Key Resources

- Core Elements of Hospital Antibiotic Stewardship Programs from the Centers for Disease Control
  - www.cdc.gov/getsmart/healthcare/pdfs/checklist.pdf
- Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America
  - http://cid.oxfordjournals.org/content/early/2016/04/11/cid.ciw118.full.pdf+html
- National Quality Forum (NQF) Playbook: A Practical Approach to Antibiotic Stewardship
  - www.qualityforum.org/Publications/2016/05/Antibiotic_Stewardship_Playbook.aspx

Other AMS Resources

- CDC Get Smart for Healthcare is a CDC campaign focused on improving prescribing practices in inpatient healthcare facilities.

  www.cdc.gov/getsmart/healthcare/index.html
- CDC Overview and Evidence to Support Stewardship

  www.cdc.gov/getsmart/healthcare/evidence.html
- Training Programs
  - MAD-ID http://mad-id.org/antimicrobial-stewardship-programs/
  - SIDP http://s3.proce.com/res/pdf/SIDP-ASP_Announcement.pdf

AMS Resource Portal

Pharmacy Systems, Inc.

Antimicrobial Stewardship Portal

Background/Getting Started

Pharmacy Systems, Inc. Resources

- Phased Program Implementation Checklist
- Phased Program Pyramid Diagram
- AMS Program Gap Analysis

External Resources

Two selected publications which review the rationale, outcomes and pharmacist's role in a successful AMS program are listed. See also the external website links below for additional resources.

2016 Guidelines from the Infectious Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America (SHEA) on Implementing an Antibiotic Stewardship Program

2010 American Society of Health-System Pharmacists (ASHP) Statement on Pharmacist Role in Antimicrobial Stewardship

http://www.cdc.gov/getsmart/healthcare/pdfs/checklist.pdf

http://www.cdc.gov/getsmart/healthcare/pdfs/core-elements.pdf

National Quality Forum (NQF) Playbook: A Practical Approach to Antibiotic Stewardship

Pharmacist Training Opportunities

Core Clinical Services to Maximize Antimicrobial Stewardship Impact

IV:PO Conversions

Antibiotic Drug Review and Information

Antibiotic Review: Antibiotic Comparison

Drug Monograph: Ceftolozane/Tazobactam
Drug Monograph: Dalvance
Drug Monograph: Oritavancin
Drug Monograph: Tedizolid

Drug Shortage: Piperacillin/Tazobactam Alternative Agent

FICS Toolkits and MUE Involving Antimicrobial Stewardship

Antibiotics & I.D. - Carbapenems
Antibiotics & I.D. – Clostridium difficile Resources
Antibiotics & I.D. - Echinocandin
Antibiotics & I.D. - Extended Infusion Zosyn
Antibiotics & I.D. - Fluoroquinolones
Antibiotics & I.D. - Fosfomycin
Antibiotics & I.D. - Vancomycin Oral

MUE: Amikacin (Traditional Dosing) Collection Form
MUE: Ampicillin 2 gram Collection Form
MUE: Antifungals, Broad-spectrum IV Collection Form
MUE: Aztreonam Collection Form
MUE: Caspofungin Collection Form
MUE: Ceftriaxone 2 gram Collection Form
MUE: Daptomycin Collection Form
MUE: Ertapenem Collection Form
MUE: Gentamicin/Tobramycin (Extended Interval Dosing) Collection Form
MUE: Gentamicin/Tobramycin (Traditional Dosing) Collection Form
MUE: Imipenem/Cilastin Collection Form
MUE: Levofloxacin Collection Form
MUE: Linezolid Collection Form
MUE: Nitrofurantoin in the Elderly Collection Form
MUE: Piperacillin/Tazobactam Collection Form

Links to External Antimicrobial Stewardship Websites

National Organization and Governmental Websites

- Centers for Disease Control and Prevention
- American Society of Health-Systems Pharmacists
  - ASHP Advantage White Paper
  - Implementing Antimicrobial Stewardship Programs in Health System
- Infectious Disease Society of America

Antimicrobial Stewardship – Academic Medical Center Websites

University of Pennsylvania

University of Kentucky

Johns Hopkins University

University of Miami Miller School of Medicine

University of California Los Angeles

Nebraska Medical Center

Antimicrobial Stewardship "Special Topic" Journals/Supplements

Pharmacotherapy – August 2012 Special Topic Issue

Healthcare Epidemiology and Infection Control – April 2012 Special Topic Issue

Guideline Links

Antimicrobial Prophylaxis in Surgery
Bacteremia: Intravascular Catheter-Related Bloodstream Infection
Bacterial Meningitis

Compliance Expectations

- *Leadership Engagement in Antimicrobial Stewardship*

Assess Current State

CDC Checklist / Core Elements

LEADERSHIP SUPPORT	ESTABLISHED AT FACILITY
A. Does your facility have a formal, written statement of support from leadership that supports efforts to improve antibiotic use (antibiotic stewardship)?	❑ Yes ❑ No
B. Does your facility receive any budgeted financial support for antibiotic stewardship activities (e.g., support for salary, training, or IT support)?	❑ Yes ❑ No

ACCOUNTABILITY
A. Is there a physician leader responsible for program outcor facility?

DRUG EXPERTISE
A. Is there a pharmacist leader responsible for working to im

KEY SUPPORT FOR THE ANTIBIOTIC STEWARDSHIP PROGRAM
Does any of the staff below work with the stewardshi

TRACKING: MONITORING ANTIBIOTIC PRESCRIBING, USE, AND RESISTANCE	
PROCESS MEASURES	**MEASURE PERFORMED**
A. Does your stewardship program monitor adherence to a documentation policy (dose, duration, and indication)?	❑ Yes ❑ No
B. Does your stewardship program monitor adherence to facility-specific treatment recommendations?	❑ Yes ❑ No
C. Does your stewardship program monitor compliance with one of more of the specific interventions in place?	❑ Yes ❑ No
ANTIBIOTIC USE AND OUTCOME MEASURES	**MEASURE PERFORMED**
D. Does your facility track rates of C. difficile infection?	❑ Yes ❑ No
E. Does your facility produce an antibiogram (cumulative antibiotic susceptibility report?	❑ Yes ❑ No

https://www.cdc.gov/getsmart/healthcare/pdfs/checklist.pdf

Assess Current State

Pharmacy Specific Activity Audit

Antimicrobial Stewardship Program (ASP)

SAMPLE Hospital *in collaboration with*

Pharmacy Systems, Inc.

Elements of an Antimicrobial Stewardship Program

Core

☒ Prospective Audit and Feedback	☒ Formulary Management	☐ Preauthorization and Restriction

Basic	Intermediate	Advanced
Clinical Activities Program (CAP℠)	**Clinical Activities Program (CAP℠)**	**Clinical Activities Program (CAP℠)**
☒ Recommendation: Intravenous to Oral Conversion	☒ Automatic: Pharmacokinetic Monitoring and Dose Optimization	☐ Automatic: Intravenous to Oral Conversion
☒ Recommendation: Pharmacokinetic Monitoring and Dose Optimization	☒ Automatic: Renal Dose Adjustment	☒ Clinical Pharmacist Consult for Antibiotic Selection and Duration of Therapy
☒ Recommendation: Renal Dose Adjustment	☒ Culture & Sensitivity: Monitoring Targeting Resistance and Treatment	☐ Culture & Sensitivity: Monitoring with De-escalation
Metric	☐ Penicillin Allergy Evaluation	**Metric**
☒ Adverse Drug Reactions – Antimicrobials: Track and Trend	**Metric**	☐ Adverse Drug Reactions: *C. difficile*
	☒ Antibiogram: Annual Review with	

ASP Binder Contents

Antimicrobial Stewardship Program Contents

Mission, Vision, Goals

A. Mission, Vision and Goals

Our mission is to ensure the appropriate use of antimicrobials and reduce antimicrobial resistance within our hospital system to improve the health of our patients. We will implement strategies to achieve that goal and measure outcomes for our facility and patients.

Our vision is to improve the overall care of patients requiring antimicrobials within our hospital.

2016 Goals

- Implement an Antimicrobial Stewardship Program to include developing a team, policies and procedures, monitoring, and reporting strategies in our hospital that are compliant with the Centers for Medicare and Medicaid Conditions of Participation (and TJC MM standard) by January 1, 2017.
- Implement two, specific strategies to impact the use of antibiotics in our hospital.

2017 Goals

- Review and update all antibiotic-containing guidelines and/or order sets to ensure adherence to national guidelines and current medical literature.
- Implement a requirement for indication and duration on all antibiotic orders.
- Implement an antibiotic "time out" procedure 48 to 72 hours after antibiotic initiation.
- Increase the number of patients converted from intravenous to oral antibiotics by 10% by April 1, 2017.
- Decrease pharmacy antimicrobial drug costs by 5% from 2016 to 2017 by January 1, 2018.
- Positively impact the C. difficile infection rate at our hospital.
- Ensure appropriate and safe use of fluoroquinolones.
- Review and reconcile all reported penicillin allergy by pharmacists.

Procedure/Policy

B. Procedure

Title: Antimicrobial Stewardship Program Procedure

Purpose: To ensure a strategic and formal process is in place by which this organization improves the use of antibiotics across the continuum.

As antibiotic resistance is one of the world's most pressing public health problems, responsible for more than two million illnesses and 23,000 deaths annually, the hospital will have a program to address antibiotic stewardship. This policy will provide framework for the hospital antimicrobial stewardship program (ASP) and establish the pharmacy's drug therapy monitoring program. ASP has been shown to improve patient outcomes significantly by individualizing dosing, reducing toxicity, and, possibly, decreasing medication costs.

Committee Composition

C. ASP Committee Composition

1. ASP Program Leader
   - Has education, training, or experience in infectious disease and/or antimicrobial stewardship
   - Generally appointed to a physician or pharmacist directly involved with antibiotic prescribing
   - Responsible for:
     - Development and implementation of a hospital-wide antibiotic stewardship program, based on nationally recognized guidelines, to monitor and improve the use of antibiotics
     - All documentation, written or electronic, of antibiotic stewardship program activities
     - Communication and collaboration with medical staff, nursing, and pharmacy leadership, as well as the hospital's infection prevention and control and QAPI programs, on antibiotic use issues
     - The competency-based training and education of hospital personnel and staff on the practical applications of antibiotic stewardship guidelines, policies, and procedures
2. ASP Pharmacist Leader – Recommended to appoint a single pharmacy leader to work with ASP Leader, if ASP Leader is not a pharmacist.
3. Other suggested team members:
   - Infection preventionist(s)/Infection control professional(s) and Hospital Epidemiologist – Responsible for hospital-wide infection surveillance, prevention, and control policies and procedures that adhere to nationally recognized guidelines, preventing and controlling healthcare-associated infections, education and training of hospital staff on infection control practices
   - Medical Staff (Clinician and Department Heads) – Help to improve feasibility and implementation of ASP actions
   - Information Technology Staff – Incorporate ASP protocols
   - Clinical Microbiology/Laboratory Staff – Ensure proper testing and accuracy of results, assist in specialized testing, identification of new MDRO, create and maintain antibiogram
   - Nursing Leadership – Assist in education and training of nursing staff as well as adherence to clinical guidelines for prevention and treatment of infection
   - Quality Improvement Staff – Assist in outcome monitoring, data collection and reconciliation with current outcome data related to infectious disease conditions

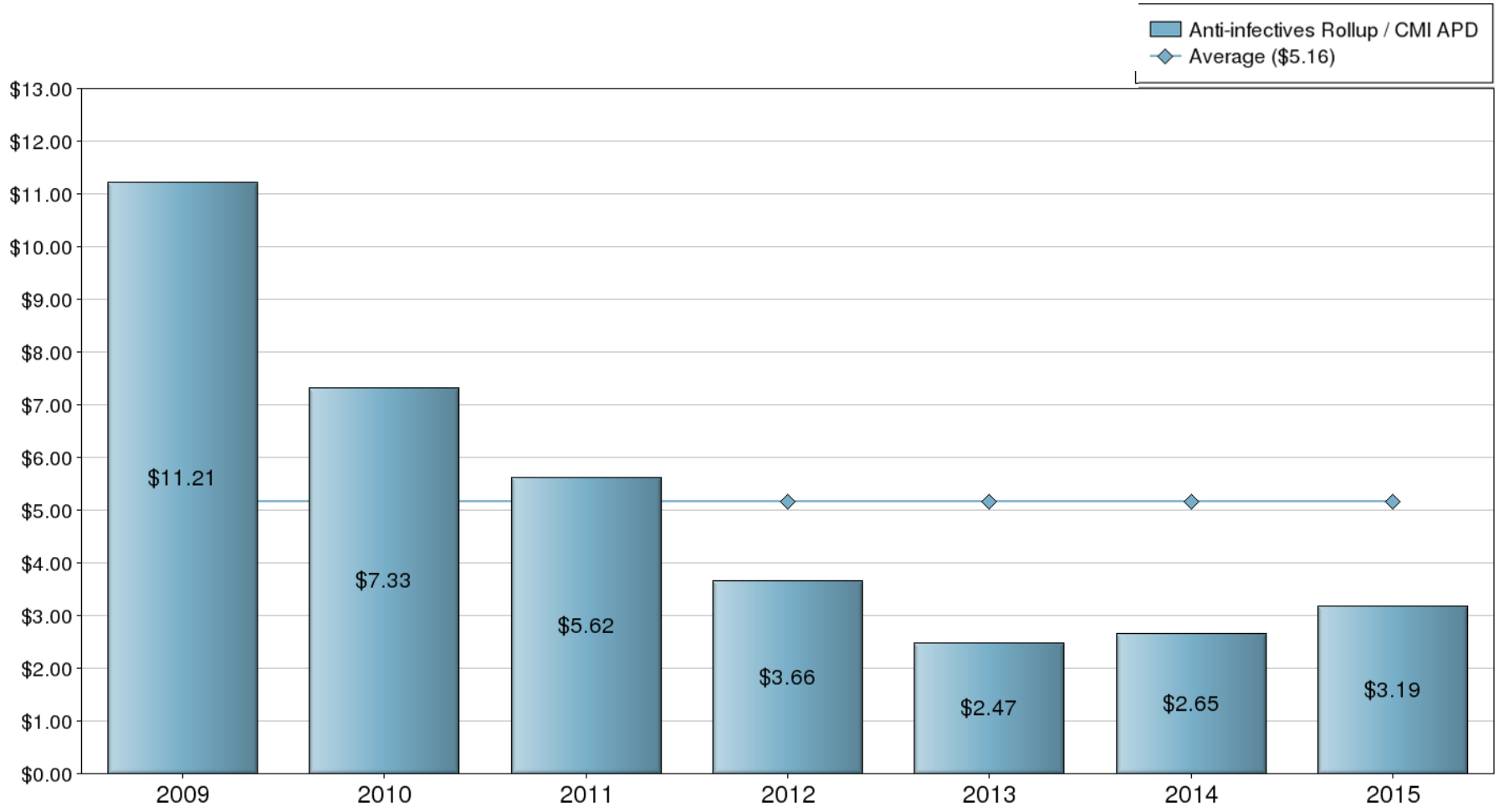
Monitoring and Outcomes

E. Monitoring and Outcomes – Collect, analyze, and report data on the ASP

- Use these data to develop other performance improvement related to antibiotics.
- Measure at least two data elements and report at least quarterly, data will be reported to the Pharmacy and Therapeutics Committee, the Medical Executive Committee, and the Executive Board.
- Data elements to be measured include:
  - Adherence to guidelines: antibiotic selection and duration of therapy
  - IV to PO rates
  - Renal dosing
  - C. difficile infection rates
  - Antibiotic expenditure (overall cost, DOT, or DDD)
  - Clinical Interventions including:
    - IV to PO changes
    - Renal dosing
    - De-escalation of therapy
    - Allergy Reconciliation
    - Discontinuation of therapy

Outcome Tracking #1

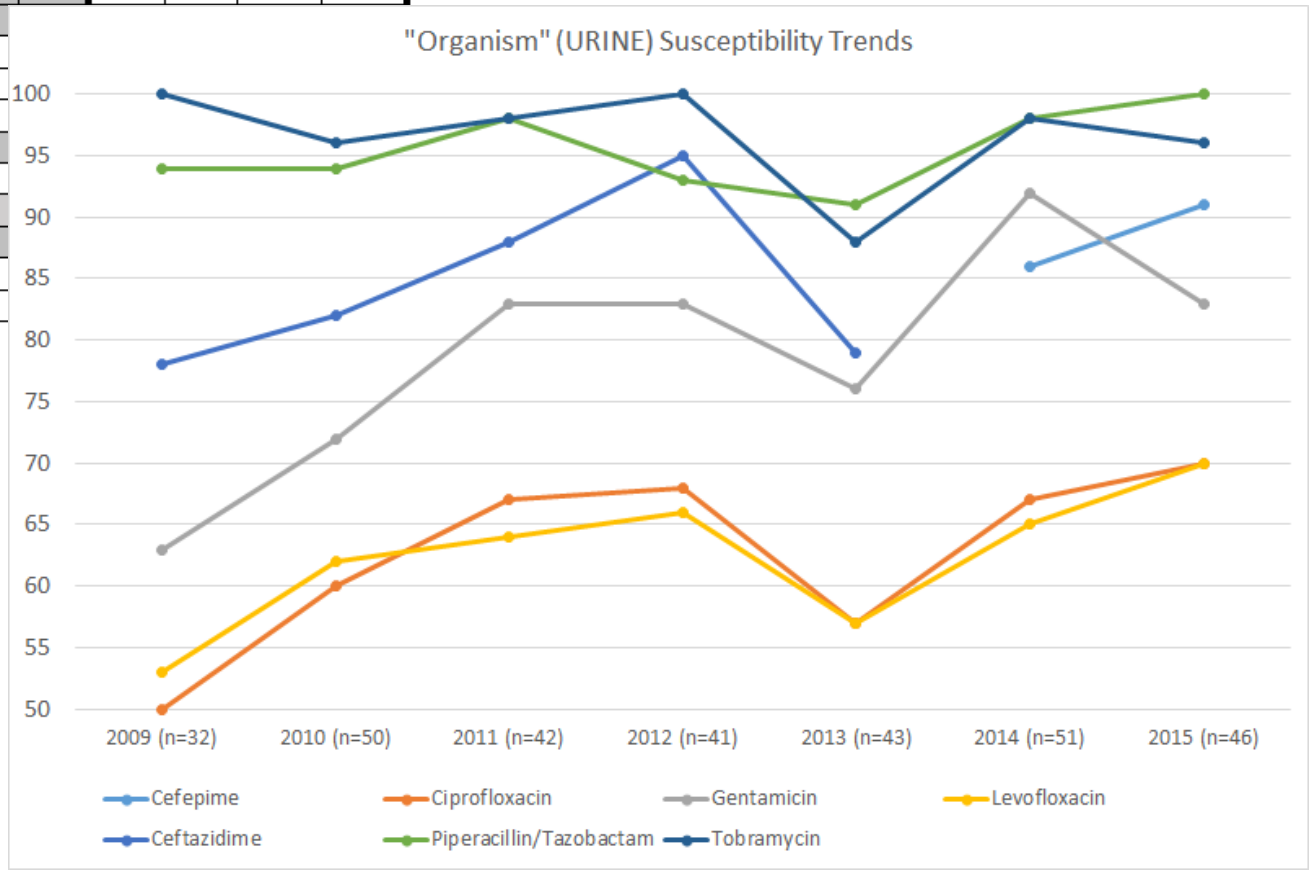
Anti-infective Spending



Outcome Tracking #2

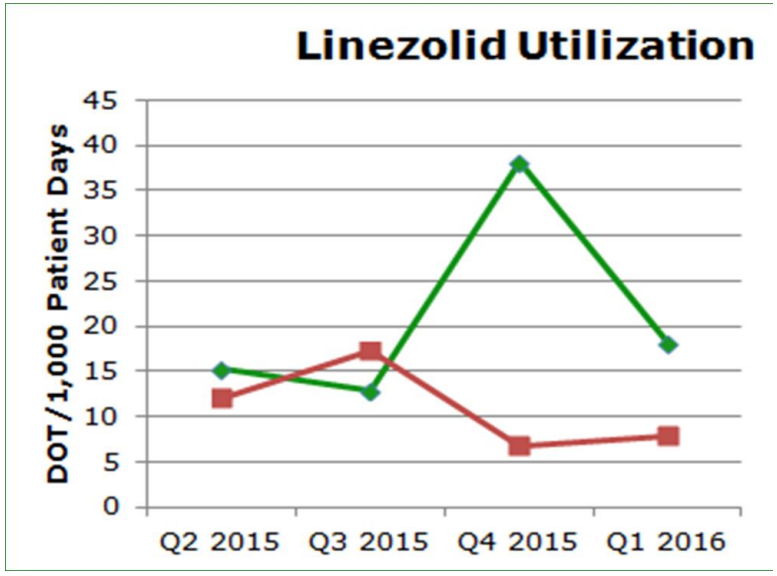
Review of Antibiogram

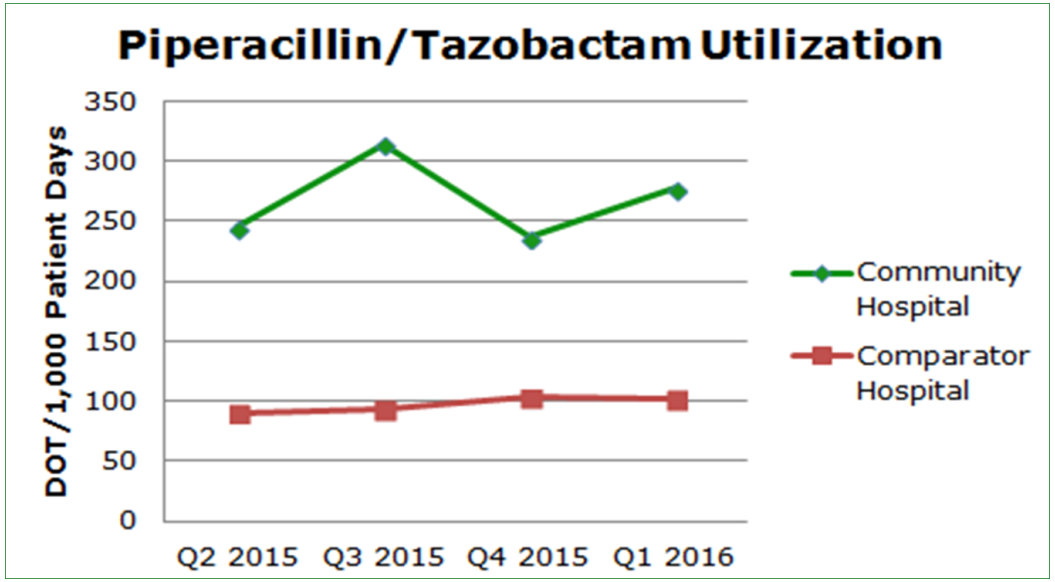
HOSPITAL	*Enter*	*Meth Staph*	*Methi Staph*	*Strept*	*Es*	*Klebs*	*Pr*	*Pseud*
Total Number of Isolates	27	108	177	97	52	26	13	44
Amikacin[$$]					98	100	100	96
Ampicillin[$]	100							
Ampicillin/Sulb (Unasyn)[$$]			96					
Amoxicillin/Clavulanate[$]			99					
Cefazolin (Ancef)[$]			100					
Cefepime (Maxipime)[$$]								
Ceftriaxone (Rocephin)[$]			100					
Ciprofloxacin (Cipro)[$]								
Ertapenem (Invanz)[$$$]								
Erythromycin[$]			57					
Gentamicin[$$]		87	89					
Imipenem/Cil (Primaxin)[$$]			99					



Outcome Tracking #3

Days of Therapy, Defined Daily Doses, etc





- *Medication Stewardship Advisor* – BD MedMined™ Services
- National Healthcare Safety Network (NHSN) http://www.cdc.gov/nhsn/
- Onsite informatics department reports on demand
- Robust Medication Use Evaluation (MUE) program is powerful

Education Compliance Program

- *Education by PSI* begins with universal content followed by a customized approach unique to each healthcare professional.
- The program provides education using a combination of
  - *Self-study:* Web-based voice-over presentations
  - *Examination:* Case-based questions to test retention
  - *Application:* Peer-review competency assessments
- A certificate of completion is available for the employee's file.
- Each organization is encouraged to host electronic materials using the native learning management software.

Program Components

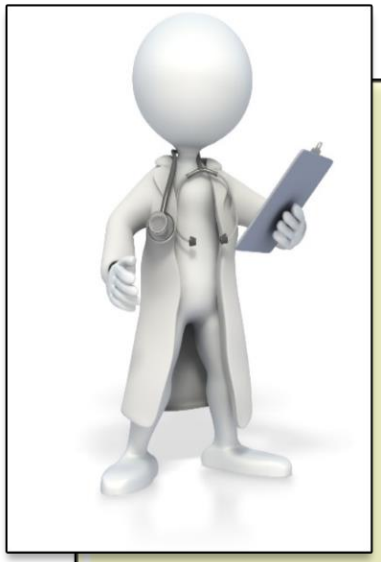
Practitioners[1]	Nursing, Quality & Infection Prevention	Pharmacists
Implementing an Antimicrobial Stewardship Program	Implementing an Antimicrobial Stewardship Program	Implementing an Antimicrobial Stewardship Program
Bugs and Drugs 101	Bugs and Drugs 101	Bugs and Drugs 101
AMS Considerations for Practitioners	AMS Considerations for Nursing & IP Staff	AMS Considerations for Pharmacists
Case Study Questions	Case Study Questions	Case Study Questions
Profession-specific Competency Assessment	Profession-specific Competency Assessment	Intervention Log submitted to show impact

1. The term practitioner is intended to include physicians, nurse practitioners, and other professionals given prescriptive authority under the guidance of the medical staff by-laws.

Influencing Stakeholders

Leadership Engagement in Antimicrobial Stewardship

Influence



Physicians

- Shared responsibility and accountability
- Interprofessional collaboration fosters learning
- Promote and achieve superior patient outcomes
- Automatic RPh programs drive efficiencies

Magic Word = "HELP"

Influence, cont'd

Administrators

- Financial implication of dollars saved
- Media attention / buzz word / hot topic
- Patient satisfaction and HCAHPS
- Advisory Board, CMS, CDC endorsement

Magic Word = "MANDATORY"

Influence, continued

Magic Word = “VALUE”

COMPETITION!!

Physicians

An effective MUE program can show individual physician performance relative to a peer group.

MUE: Aminoglycosides (Traditional)

Criteria	Yes	No	N/A	Physician	Hospital
1 Appropriate Dosing	2	1	0	67%	48%
2 Appropriate Timing of Levels	0	0	3	0%	47%
3 Appropriate Levels Achieved	0	0	3	0%	0%

Total Cases: 3

MUE: Aztreonam Utilization

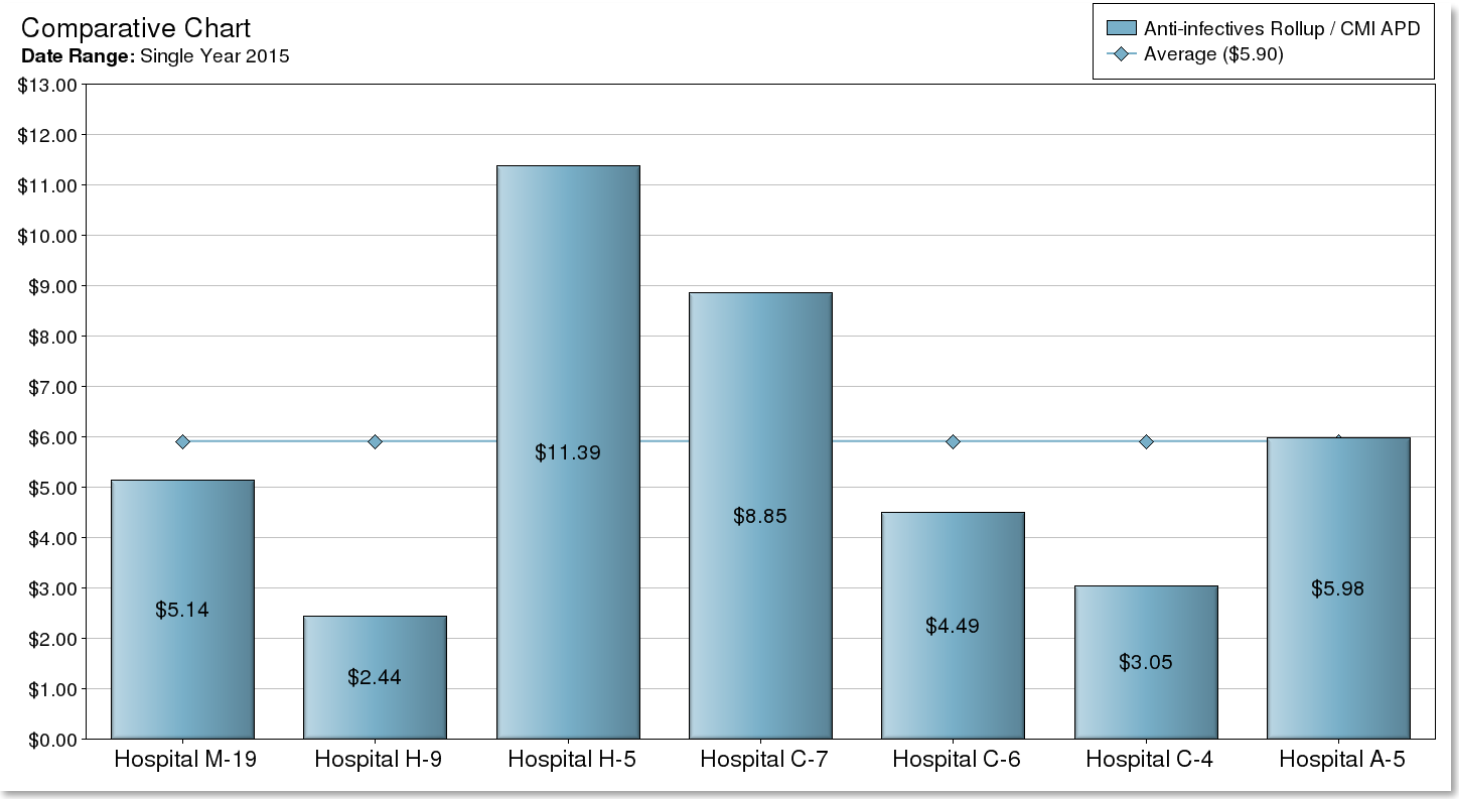
Criteria	Yes	No	N/A	Physician	Hospital
1 Appropriate Prescribing (A)	10	0	1	100%	100%
2 Appropriate Prescribing (B)	6	2	3	75%	92%
3 Appropriate Prescribing (C)	3	8	0	27%	27%
4 Appropriate Dosing	11	0	0	100%	87%
5 De-escalation Performed?	9	0	2	100%	100%

Total Cases: 11

COMPETITION!!, cont'd

Administrators

Comparing the hospital to others can show areas for success or improvement.



COMPETITION!!, continued

Team Members

Tracking interventions relative to peers or setting expectations on performance evaluation can improve activity level.

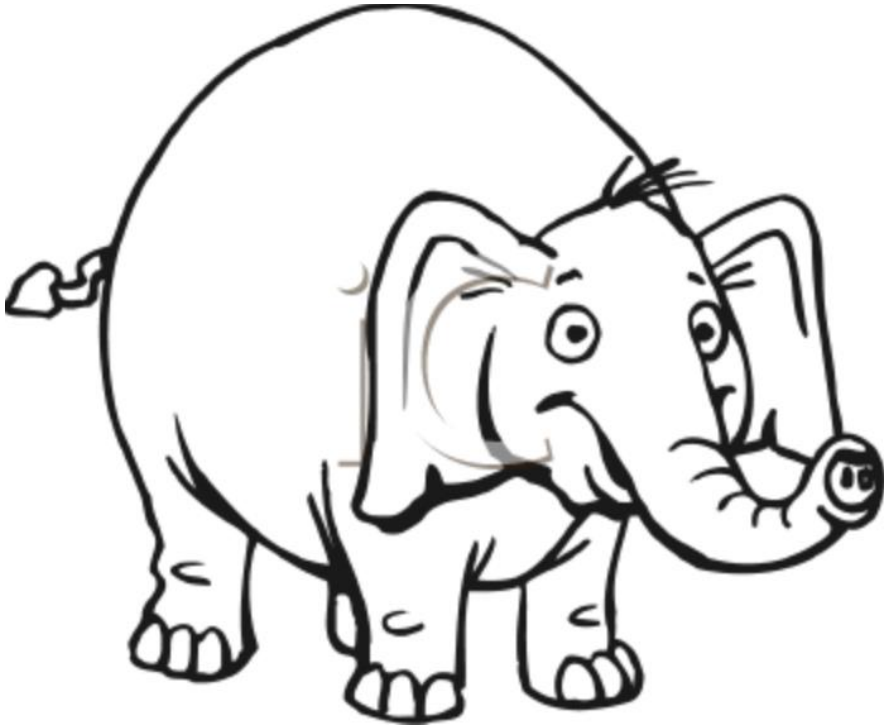
Event Type Summary F

Dates: 1/1/2016 to 12/9/2016 Entered By:

Event Type	Jan16	Feb16	Mar16	Apr16	May16	Jun16
Antibiotic Streamlining - Antifungal		1				
Antibiotic Streamlining - Aztreonam		1				
Antibiotic Streamlining - Carbapenem		1				
Antibiotic Streamlining - Other	1	3		1		
Antibiotic Streamlining - Pip/Tazo		2				
Antibiotic Streamlining - Quinolone		1		1		
Antibiotic Streamlining - Vancomycin	2	8		1	1	
Antibiotic Streamlining: Adjustment	1	1				
Antibiotic Streamlining: Consult	2	3			1	
Antibiotic Streamlining: Monitoring	10	14		4	6	2
Totals	16	35		7	8	2

It is recommended to implement as many ASP strategies at once, to ensure you have a robust program.

- True or False?



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