2016 CDC Warning on Fluroquinolone Antibiotic Use: Rolling Back Use for Patient Safety

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Disclosure

- The program chair and presenters for this continuing education activity have reported no relevant financial relationships.

Learning Objectives

- Describe system-wide development of antimicrobial stewardship teams in a large health system

- Discuss strategies for prospective monitoring

- Explain use of various tools to ensure accountability and resulting outcomes

Self-Assessment Questions

1. Partnership between the following members is the key for success in antimicrobial stewardship activities: a. Pharmacists and physicians; b. Physicians and case managers; c. Physicians and housekeeping personnel; d. Pharmacists and case managers

2. Which of the following tool is critical to monitor success of a stewardship program? a. Antimicrobial usage data; b. Resistance trend; c. Compliance to guidelines/protocols; d. Patient care outcome data; e. All of the above

3. Prospective monitoring of antimicrobial use is critical for a. De-escalation; b. Discontinuation of therapy; c. Ensuring appropriate dose; d. Bug drug mismatch; e. All of the above

Why is Antimicrobial Stewardship a Safety Imperative?

Mrs. Smith was a healthy patient in her 60s. She developed knee pain and had to undergo arthroscopy. Her surgeon, worried about infection, prescribed oral antibiotics for 2 weeks.

A week into her treatment, she developed bad diarrhea and stomach pain. She went to her regular doctor who saw her very dehydrated and sent her to the ED.

In the ED, she was hypotensive, her abdomen was very tender. Her WBC was 95,000 and her stool *Clostridium difficile* test was positive. She progressed to develop septic shock and passed away.

Fluroquinolone Warning

FDA Drug Safety Communication
FDA advises restricting fluoroquinolone antibiotic use for certain uncomplicated infections; warns about disabling side effects that can occur together

Safety Announcement

[05-12-2016] The U.S. Food and Drug Administration is advising that the serious side effects associated with fluoroquinolone antibacterial drugs generally outweigh the benefits for patients with acute sinusitis, acute bronchitis, and uncomplicated urinary tract infections who have other treatment options. For patients with these conditions, fluoroquinolones should be reserved for those who do not have alternative treatment options.

An FDA safety review has shown that fluoroquinolones when used systemically (i.e. tablets, capsules, and injectable) are associated with disabling and potentially permanent serious side effects that can occur together. These side effects can involve the tendons, muscles, joints, nerves, and central nervous system.

As a result, we are requiring the drug labels and Medication Guides for all fluoroquinolone antibacterial drugs to be updated to reflect this new safety information. We are continuing to investigate safety issues with fluoroquinolones and will update the public with additional information if it becomes available.

Patients should contact your health care professional immediately if you experience any serious side effects while taking your fluoroquinolone medicine. Some signs and symptoms of serious side effects include tendon, joint and muscle pain, a "pins and needles" tingling or pricking sensation, confusion, and hallucinations. Patients should talk with your health care professional if you have any questions or concerns.

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Our Story

Ascension Market Share

- Largest non-profit health system in US

- 25 states and DC

- 141 hospitals

- >21,000 acute care beds

- 2,500 clinics

- We are very diverse from *critical access* to large *tertiary care* centers

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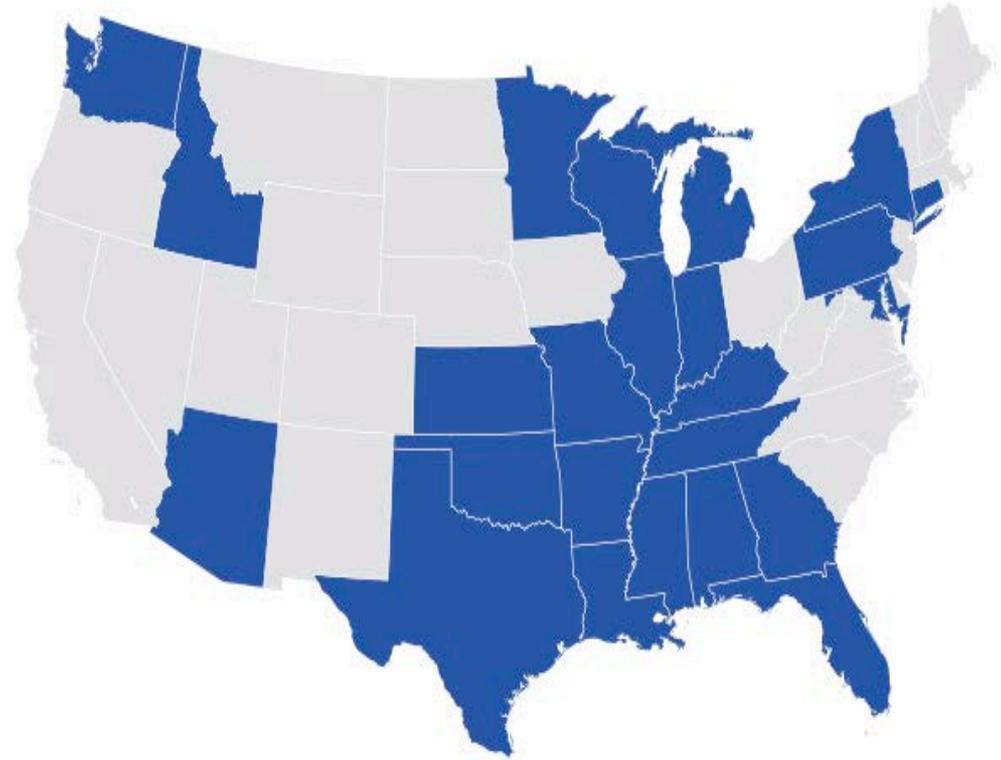
Background: System Antimicrobial Stewardship Evaluation

- 2013 survey of Ascension hospitals:

  - 48.4% had an established ASP

  - Only 25% of hospitals < 200 beds had ASP

| Results	2013
Restricted antimicrobials for specific uses	42.2%
Post prescribing evaluation by pharmacy	37.5%
Preapprovals from Infectious Diseases	23.4%
Mandatory Infectious Diseases consultation for certain antimicrobials	26.6%
Preapprovals from Infection Disease Pharmacists	6.3%
Clinical pathways for different infections	29.7%

What Do you Do without an ID Support?
(2013 – 14 Ascension hospitals)

	<200 beds (n=34)	201-500 (n=24)	>500 (n=6)
Do you have an ID physician?	21%	83%	100%
Do you have an ID pharmacist?	15%	46%	83%

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Smaller Hospitals Use More Antibiotics

Proportion of hospitals with DDD≤1 and >1 is shown for different size hospitals based on patient-days
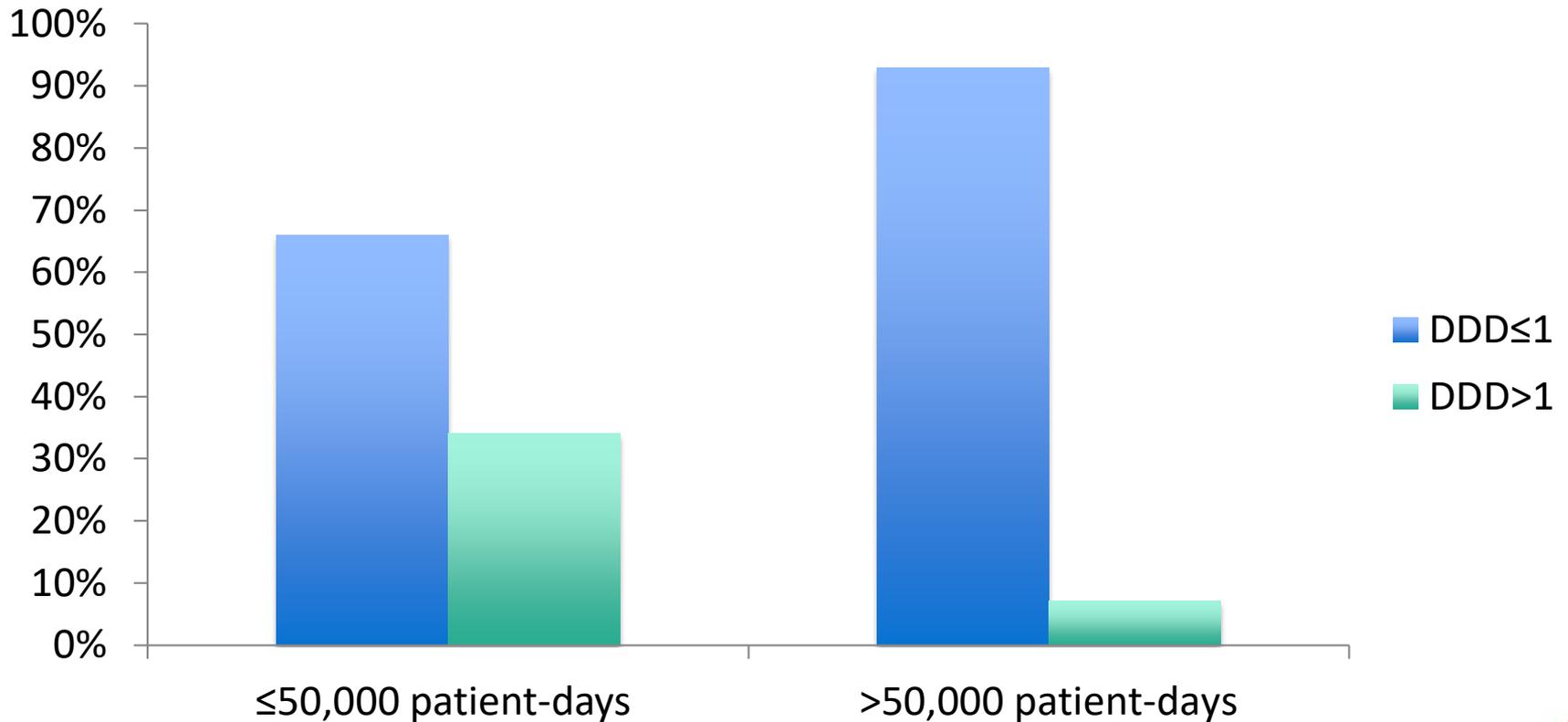
Same System, with Identical AS Policies, Restrictions, and Formulary

Hospital	Average antimicrobial use (DDD) per 1000 patient-days	Broad Spectrum for MDROs (DDD) per 1000 patient-days
A (365 beds)	839	108
B (200 beds)	936	32
C (804 beds)	622	43
D (376 beds)	1030	114

- Hospital A and B: ID physicians with a majority focused on appropriate antimicrobial use
- Hospital C: ID physicians with strong stewardship, lower overall use of antibiotics and broad spectrum agents
- Hospital D: ID physicians not stewards

The System Strategic Plan

- Establish a system Antimicrobial Stewardship structure (oversight)

- Develop recommendations for evidence-based testing and treatment pathways to infections

- Standardize the use of the different antimicrobial classes promoting most narrow spectrum agents and consolidating to a national formulary

- Build capacity for hospitals to achieve their goals from leadership buy-in to infrastructure to do the work

Collaboration: ASP and other Stakeholders

Infectious Diseases	Infection Prevention	Medical Students
Hospitalists	Nurses	Resident Physicians
Surgeons	Lab/Microbiology	Pharmacy Residents
Emergency Physicians	Midlevel Providers	Pharmacy Students
Intensivists	Pharmacists	Information Technology

Goal alignment is critical for support

System Support to Hospitals

1. Local Antimicrobial Stewardship Programs for all hospitals implemented in December 2015

2. Formal education (SIDP certificate) of at least one pharmacist in antimicrobial stewardship per hospital (n=150)

3. Implementation of medication management clinical decision support system to optimize antimicrobial stewardship

4. Multiple system initiatives to be implemented at all hospitals

5. Track and provide monthly benchmarking data to assess progress at the facility level

6. Site visits by medical and pharmacy leader as needed

Antimicrobial Stewardship

Local ASP

Local Supporters

Local Leadership

System Influence

How Did We Build the Infrastructure?

Local Antimicrobial Stewardship Programs
Promote compliance with the national ASP recommendations
Evaluate and implement other initiatives based on local needs
Partner with other stakeholders to reduce inappropriate antibiotic use

Ascension Health Antimicrobial Stewardship Committee
National members work on plans to standardize and optimize appropriate use of antimicrobials and testing at all Ascension facilities

Regional Champions
Support system level recommendations
Build capacity for smaller facilities serving as experts
Serve as members at national committee

Achieving Antimicrobial Stewardship

- Optimize and standardize **therapy** (including prospective monitoring)

- Optimize **testing** for infection workup

- Use data mining and electronic decision **support** to enhance appropriate antimicrobial use

- Evaluation of use for different classes through a dashboard and direct engagement of outliers

# Impact of Antimicrobial Stewardship

Impact of Evidence Based Indications and Prospective Monitoring

Antibiotic	FY15*	FY16*	% Change	Avoidance
Aztreonam	3.7	3.1	16	$300,000
Ceftaroline	1.7	1.1	35	$700,000
Daptomycin	12.2	8.7	29	$3,400,000
Ertapenem	6.6	5.4	18	$30,000
Linezolid	4.7	4.1	13	$40,000
Tigecycline	1.3	0.8	38	$440,000
Vancomycin	94.7	107.1	(+)13	-$225,000

*Defined daily dose/1000 Patient Days

Quinolone Reduction FY15 to FY16

System Quinolone DDD/1000 Patient Days
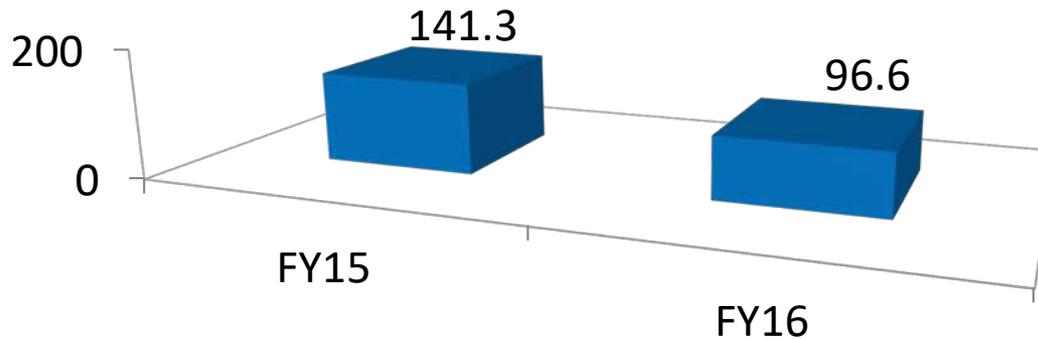
- Quinolone usage decreased 40% between FY15 and current FY16
- The top 10 facilities in usage showed an average 34% decrease
- Each facility saw an increase of 40% in utilization of Vancomycin

Impact of Prospective Monitoring on Quinolone: 40% Reduction

Success Stories – Impact on Quinolone Top 10 Users			
Facility	**FY'15***	**FY'16***	**% Decrease**
St. Vincent's East	295.0	173.7	41.1%
St. Vincent's Medical Center Clay County	294.9	116.1	60.6%
Sacred Heart Hospital on the Emerald Coast	285.3	161.1	43.5%
Saint Thomas Rutherford Hospital	281.1	179.8	36.0%
Our Lady of Lourdes Memorial Hospital	272.6	224.1	17.8%
Providence Health Center - TX	253.6	166.2	34.5%
Providence Hospital - AL	236.8	88.8	62.5%
Saint Thomas West Hospital	223.2	141.9	36.4%
Genesys Regional Medical Center	201.2	135.7	32.6%
St. Mary's Hospital - Amsterdam	199.9	141.7	29.1%

*Defined Daily Dose/1000 patient Days

Example: EMR Optimization- Jacksonville

Levofloxacin Use Criteria

The Medical Executive Committee has restricted Levofloxacin (LEVAQUIN) to the following conditions:

Select one of the following reasons for Levofloxacin use in this patient.

- ○ Patient with type 1 reaction to both penicillin and cephalosporins
- ○ Definitive therapy for multidrug resistant organism in which the isolate is resistant to all beta-lactams and susceptible to levofloxacin
- ○ For bacteremia stepdown therapy in which organism is susceptible
- ○ Other

In the rare circumstance this patient DOES NOT MEET any of the criteria above, please document indication below.

Use of "Other" option will be audited and presented to MSPIC for appropriateness

Hospital-acquired/Ventilator-associated Pneumonia Order Set

HOSPITAL-ACQUIRED/VENTILATOR-ASSOCIATED PNEUMONIA ORDER SET-Adult Inpatient

Duration of Therapy: The recommended duration of therapy may depend on severity of the infection and resolution of symptoms. Typical duration can range from 7-14 days. The duration built into the orders below reflects the minimum duration of therapy and should be re-evaluated as more information becomes available.

Antibiotics: Hospital-Acquired Pneumonia (HAP) or Ventilator-Associated Pneumonia (VAP) or Structural Lung Disease*

☐ Piperacillin/tazobactam 4.5 g, IV piggyback, q8hr, infuse over 4 hours, Duration: 7 days
*** OR ***

☐ Cefepime 1 g, IV piggyback, q6hr, Duration: 7 days

For patients with documented allergy to both penicillin AND cephalosporin antibiotics

☐ Pharmacy Consult: Assess allergy status with patient and document into the EMR

☐ Meropenem 500 mg, IV piggyback, q6hr, Duration: 7 days

In addition to above, consider the following: if MRSA Risk (necrotizing pneumonia, recurrent MRSA infections, septic shock, post influenza infection, failure while on broad-spectrum gram negative monotherapy, immunocompromised)
Medications

☐ Vancomycin 25mg/kg (max dose: 2g) IV piggyback, ONCE, then PKDS, Duration: 3 days (review MAR to confirm previous administration in the ER)

In addition to above, consider the following: if double gram negative coverage for MDROs necessary- Pneumonia with septic shock and increased risk factor for MDR organisms (Should not be used as monotherapy)

☐ Tobramycin 7 mg/kg, IV piggyback, ONCE, then PKDS, Duration: 3 days (review MAR to confirm previous administration in the ER)

Laboratory
☑ Sputum Gram stain, Culture and Sensitivity (Preferably should be obtained prior to administering antibiotics)
☑ Culture Blood (preferably should be obtained prior to administering antibiotics)
☑ Culture Blood (preferably should be obtained prior to administering antibiotics)

*Consider alternative dosing regimen for beta lactams for Cystic Fibrosis patients or high MIC organisms.

Community-acquired Pneumonia Order Set

COMMUNITY-ACQUIRED PNEUMONIA ORDER SET-Adult Inpatient

Medications
Antibiotics: CAP- NON-ICU
         Preferred Regimen

☑ CefTRIAXone 1 g, IV piggyback, q24hr, Indication: Community Acquired Pneumonia, Duration: 3 days
  *** Plus ***

☑ Azithromycin 500 mg, PO, q24hr, Indication: Community Acquired Pneumonia, Duration: 3 days
*** OR ***

☐ Doxycycline 100 mg orally every 12 hours times 6 doses (IF PATIENT ALLERGIC TO MACROLIDE) Duration: 3 days

☑   Cefuroxime 500mg PO, q12hr (start 24 hours after third dose of ceftriaxone), Indication: Community Acquired Pneumonia, Duration: 2 days

For patients with confirmed type-I allergy to cephalosporin antibiotics

☐ Pharmacy Consult: Assess allergy status with patient and document into the EMR

☐ Levofloxacin 750 mg, IV piggyback, ONCE (If not already given), Indication: Community Acquired Pneumonia
*** Plus ***

☐ Levofloxacin 750 mg, PO q24hr (start 24 hours after initial IV dose), Indication: Community Acquired Pneumonia, Duration: 4 days

Antibiotics: CAP- ICU (Evaluation within 72 hours should take place to ensure appropriate regimen)
         Preferred Regimen

☐ CefTRIAXone 1 g, IV piggyback, q24hr, Indication: Community Acquired Pneumonia, Duration: 5 days
*** OR ***

☐ CefTRIAXone 2 g, IV piggyback, q24hr (If weight >120kg), Indication: Community Acquired Pneumonia, Duration: 5 days
  *** Plus ***

☐ Azithromycin 500 mg, IV piggyback, q24hr, Indication: Community Acquired Pneumonia, Duration: 5 days

For patients with confirmed type-I allergy to cephalosporin antibiotics

☐ Pharmacy Consult: Assess allergy status with patient and document into the EMR

☐ Levofloxacin 750 mg, IV piggyback, q24hr, Indication: Community Acquired Pneumonia, Duration: 5 days

Urinary Tract Infection Order Set

Complicated URINARY TRACT INFECTION/ Pyelonephritis ORDER SET- Adult Inpatient

Medications (The recommended duration of therapy may depend on severity of the infection and resolution of symptoms. Typical duration can range from 5-14 days. The duration built into the orders below reflects empiric therapy and should be re-evaluated as more information becomes available.

Antibiotics: PYELONEPHRITIS/Complicated UTI-Low risk for multi-drug resistant organisms
Preferred Regimen

☐ CefTRIAXone *1 g, IV piggyback, q24hr, Indication: Urinary Tract Infection, Duration: 5 days*

For patients with confirmed type-I allergy to cephalosporin antibiotics

☐ *Pharmacy Consult: Assess allergy status with patient and document into the EMR*

☐ Ciprofloxacin 400mg, IV piggyback, q12hr, Indication: Urinary Tract Infection, Duration: 5 days

Antibiotics: PYELONEPHRITIS/Complicated UTI—High risk for Multi-drug Resistant organisms, including Pseudomonas aeruginosa,
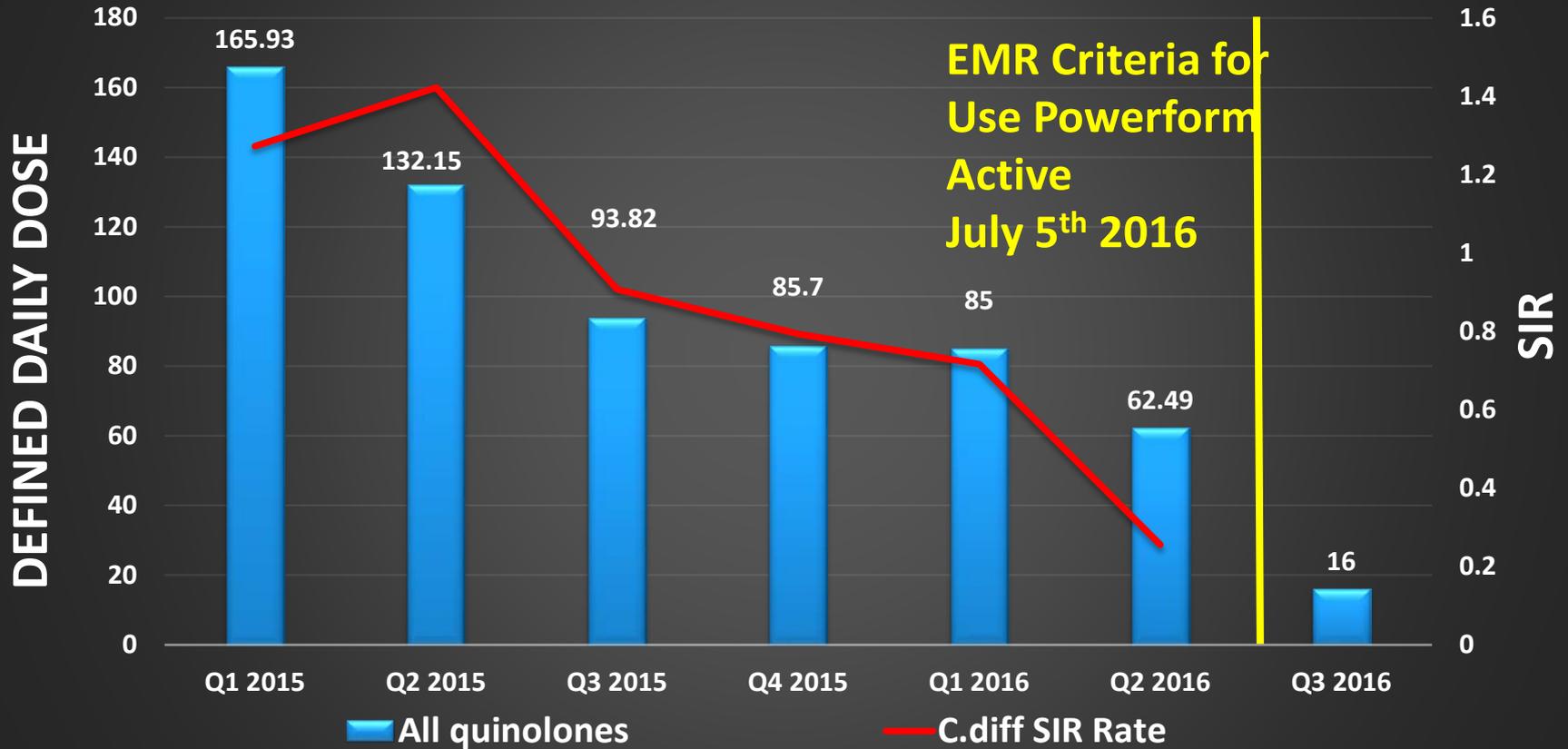**Preferred Regimen**

☐ Cefepime 2000 *mg, IV piggyback, q12hr, Indication: Urinary Tract Infection, Duration: 5 days*
*** OR ***

☐ Piperacillin/tazobactam *4.5 g, IV piggyback, q8hr (4-hr infusion), Indication: Urinary Tract Infection, Duration: 5 days*

☐ Piperacillin/tazobactam *3.375 g, IV piggyback, q8hr (4-hr infusion), Indication: Urinary Tract Infection, Duration: 5 days*
For patients with confirmed type-I allergy to both penicillin and cephalosporin antibiotics

☐ *Pharmacy Consult: Assess allergy status with patient and document into the EMR*

☐ Ciprofloxacin 400mg, IV piggyback, q12hr, Indication: Urinary Tract Infection, Duration: 5 days
*** AND ***

☐ Gentamicin 5mg/kg, IV piggyback, ONCE (for CrCl >30mL/min; consider 2.5mg/kg if CrCl <30mL/min)
Indication: Urinary Tract Infection

☐ Infectious Disease Consult

Antibiotics: PYELONEPHRITIS/Complicated UTI—Documented history of urinary infection or colonization with Extended Spectrum Beta Lactamase (ESBL) organisms

☐ Meropenem 500mg, IV piggyback, q8hr, Indication: Urinary Tract Infection, Duration: 5 days

☐ Infectious Disease Consult

Example: Correlation Between FQ Use and C. difficile SIR

St. Vincent's Medical Center- Riverside

EMR Criteria for Use Powerform Active July 5th 2016

Data labels: 165.93, 132.15, 93.82, 85.7, 85, 62.49, 16

Legend: All quinolones — C.diff SIR Rate

Optimize *Clostridium difficile* Testing

- Standardize *C. difficile* testing across all Ascension facilities

- Address when, what, and how often to test

- Incorporate into EMR appropriate testing (clinically significant diarrhea, no repeat negative tests within a week, no tests for cure)

- Goal: less false positive results, less inappropriate treatment, less cost, meaningful benchmarking and lower publicly reported SIR

Clostridium difficile Testing - Ascension

- Proper identification of patients for testing (clinical suspicion and unformed stool)

- Using two-step assay (GDH + toxin A and B; backup molecular for indeterminate)→ provides toxin result

- Using the test only for approved indications (i.e., sample type is compliant with the FDA approved indications)

- Avoiding any duplicate testing, repeat testing for patients with negative results within 1 week, and any test of cure

- Encourage all hospitals to incorporate these recommendations into their electronic health records if feasible.

Example: C. Difficile Testing- EHR Order Form - Jacksonville

Clostridium Difficile Order - Criteria For Use

Does the patient have a clinically documented ileus?

If ileus due to C. Diff is suspected, testing on formed stool must be specifically requested when ordering.

○ Yes ● No

If C. Diff has been ordered in that past 7 days, the order will not be able to be placed on the patient.

All of the following should be complete prior to order C. Diff 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

```
IView Stool Documentation (last 24 hrs):
   Stool Count   1   07/31/2016 04:00
   Stool Description   Liquid   07/30/2016 19:00
   Stool Count   1   07/30/2016 19:00
Laxatives Administered (last 48 hrs):
   senna   Not Done: Not Appropriate at this Time   07/30/2016 21:00
   docusate   100 mg   07/30/2016 09:08
   senna   8.6 mg   07/29/2016 21:24
   docusate   100 mg   07/29/2016 10:22
C.diff Toxin Test Orders (last 7 days):
   None
C.diff Toxin Test Results (last 30 days):
   None
```

● Yes ○ No
Does the patient have clinical significant diarrhea?
Defined as at least 3 liquid stools within 24hr

● Yes ○ No
Does the patient have liquid, watery stools?
Formed stool will not be tested.

● Yes ○ No
Have any laxatives been administered in the last 48 hours?
If yes, consider canceling order.

○ Yes ● No
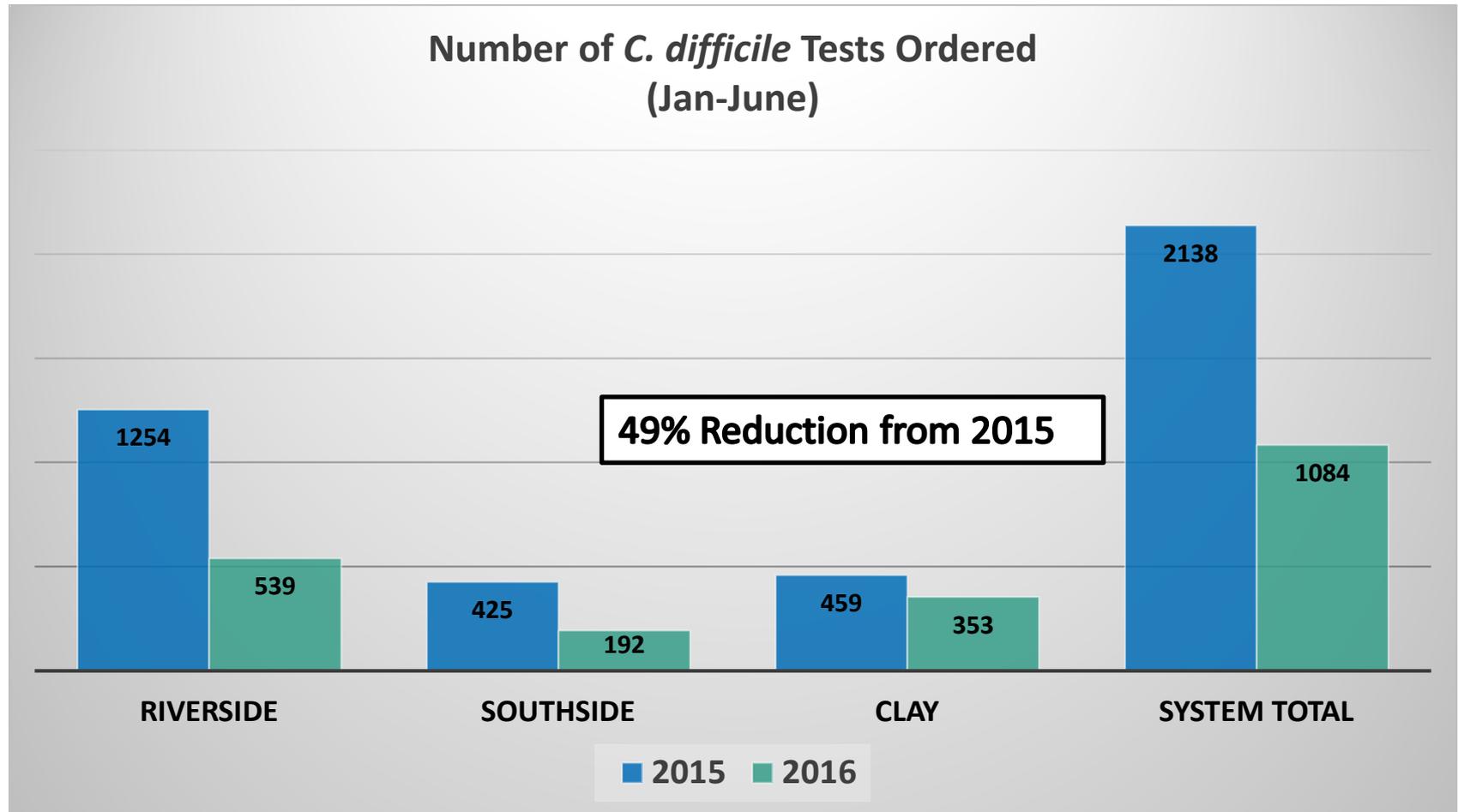**Has a C. Diff test been ordered in the past 7 days?**
If yes, C. diff order is unable to be processed within 7 days of last order.

○ Yes ● No
Has the patient had a positive C. diff test in the past 30 days?
If yes, "test-of-cure" is not recommended

C. Difficile Test Orders: Jacksonville Experience

Number of *C. difficile* Tests Ordered (Jan-June)

49% Reduction from 2015

	RIVERSIDE	SOUTHSIDE	CLAY	SYSTEM TOTAL
2015	1254	425	459	2138
2016	539	192	353	1084

Monthly Antimicrobial Utilization Dashboard Leads to Identify Successes and Opportunities

Systemic Antibiotics	System FY16	Facility FY16	System FY17	Facility FY17	TAG Recommendation	Rolling Averages (Last Month of Data - August 2016)			
						3 month	6 month	9 month	12 month
Systemic Antibiotics	849.9	644.5	807.2	726.2	N/A	738.5	724.5	692.3	670.2

Specific Agents	System FY16	Facility FY16	System FY17	Facility FY17	TAG Recommendation	Rolling Averages (Last Month of Data - August 2016)			
						3 month	6 month	9 month	12 month
Aztreonam	2.8	2.7	2.4	0.2	3.0	0.3	0.5	1.9	2.4
Ceftaroline	1.2	0.2	1.3	0.6	1.0	0.4	0.3	0.2	0.3
Daptomycin	8.4	3.8	8.6	4.4	7.0	4.1	4.6	4.3	3.8
Ertapenem	5.5	3.4	3.8	1.8	5.0	1.7	1.4	2.5	3.3
Fidaxomicin	0.4	0.4	0.3	0.0	N/A	0.0	0.4	0.3	0.2
Linezolid	4.0	3.5	3.6	1.2	3.0	1.7	3.3	3.1	3.0
Tigecycline	1.0	0.3	0.6	0.0	1.0	0.0	0.0	0.0	0.3
Vancomycin	100.3	95.8	106.4	145.3	N/A	131.7	123.1	120.5	114.1

Drug Classes	System FY16	Facility FY16	System FY17	Facility FY17	TAG Recommendation	Rolling Averages (Last Month of Data - August 2016)			
						3 month	6 month	9 month	12 month
Carbapenems	24.6	13.3	28.5	16.5	21	18.2	17.4	17.7	15.1
Cephalosporins	243.0	198.1	207.7	187.7	N/A	202.7	224.6	208.5	197.5
3rd Generation Cephalosporins	68.9	46.7	72.3	46.8	N/A	57.1	52.2	49.6	46.0
4th Generation Cephalosporins	63.8	20.1	21.1	0.0	N/A	4.1	32.7	26.5	20.4
Penicillins	157.2	95.0	178.1	161.2	N/A	154.0	135.1	112.4	102.3
Extended - Spectrum Penicillins	80.5	29.0	105.0	96.5	N/A	82.1	57.7	43.1	36.9
Quinolones	88.6	138.3	68.4	92.1	N/A	109.7	110.0	124.5	132.4

- Hospital level detail and comparison data at the system Level
- Monitored and updated monthly
- Includes specific agents with assigned guidelines

Red Green Dashboard

Hosp	Dapto-mycin Target	Dapto-mycin Actual	Line-zolid Target	Linezo-lid Actual	Tigecy-cline Target	Tigecy-cline Actual	Ceftaro-line Target	Ceftarol-ine Actual
X	9.5	7.1	2.9	1.8	2.0	2.3	1.5	1.8
Y	9.5	5.4	2.9	2.0	2.0	1.1	1.5	1.0

Opportunities for Improvement: How Do You Compare Against Others?
DDD/1000 Patient days

	Average	Minimum	Maximum
Carbapenem	29.4	23.9	38.8
Cephalosporins	278.5	222.6	368.6
Quinolone	176.7	108	265

Clinical Decision Support Tool

Goal = Improve workflow efficiency to achieve *real time* clinical interventions to improve patient care outcomes

Radiology

Admissions

MEDS

Lab

OR Procedures

Post-op Notes

Surveillance Engine

Clinical Decision Support Tool

- Infection control surveillance and medication management software; helps **prospectively** address best treatment
- Being implemented for all hospitals
- CDS implementation has occurred at 57 Ascension hospitals from March 2015 – December 2015.
- CDS has been built to address 8 target areas including Antimicrobial Stewardship
- Within each target area, there are several rule alerts built to address those areas
- Standardized algorithm based rules for all hospitals: de-escalation, IV to PO, appropriate treatment (bug-drug mismatch, duplicate therapy), testing stewardship
- Helps optimize dose, duration and route of antimicrobials

Antimicrobial Stewardship (AMS) Alerts

Bug/Drug Mismatch - Targeted Antimicrobials (sterile sites)	E. faecalis (Pen S) on Vancomycin or Linezolid
Anaerobic double coverage	CAP Overtreatment
Atypical double coverage	Targeted Surveillance - Aztreonam
Beta-lactam double coverage	Targeted Surveillance - Ceftaroline
Broad Spectrum Antimicrobial Review at 72 hrs	Targeted Surveillance - DAPTOmycin
Ceftriaxone/Cefotaxime Review at 72 hrs	Targeted Surveillance - Fidaxomicin
Quinolone Review at 72 Hours	Targeted Surveillance - Linezolid
Positive cultures @ 72 hours (sterile sites)	Targeted Surveillance - New Gram (+) Agents
MSSA Culture Streamlining	Targeted Surveillance - Tigecycline
C.diff positive and on a laxative	

Antimicrobial Stewardship Rules and Interventions

Rule Name	Interventions
Atypical double coverage	320
Beta-lactam double coverage	996
Broad Spectrum Antimicrobial Review at 72 hr	5113
CAP Overtreatment	289
E. faecalis (Pen S) on Vancomycin or Linezolid	193
MSSA Culture Streamlining	635
Positive cultures @ 72 hours (sterile sites)	273
Quinolone Review at 72 Hours	1187
Targeted Surveillance – Aztreonam	294
Targeted Surveillance – Ceftaroline	185
Targeted Surveillance – Daptomycin	648
Targeted Surveillance – Fidaxomicin	53
Targeted Surveillance – Linezolid	729
Targeted surveillance –Tigecycline	97

Reduction of Active order for a Quinolone Use >3 Days
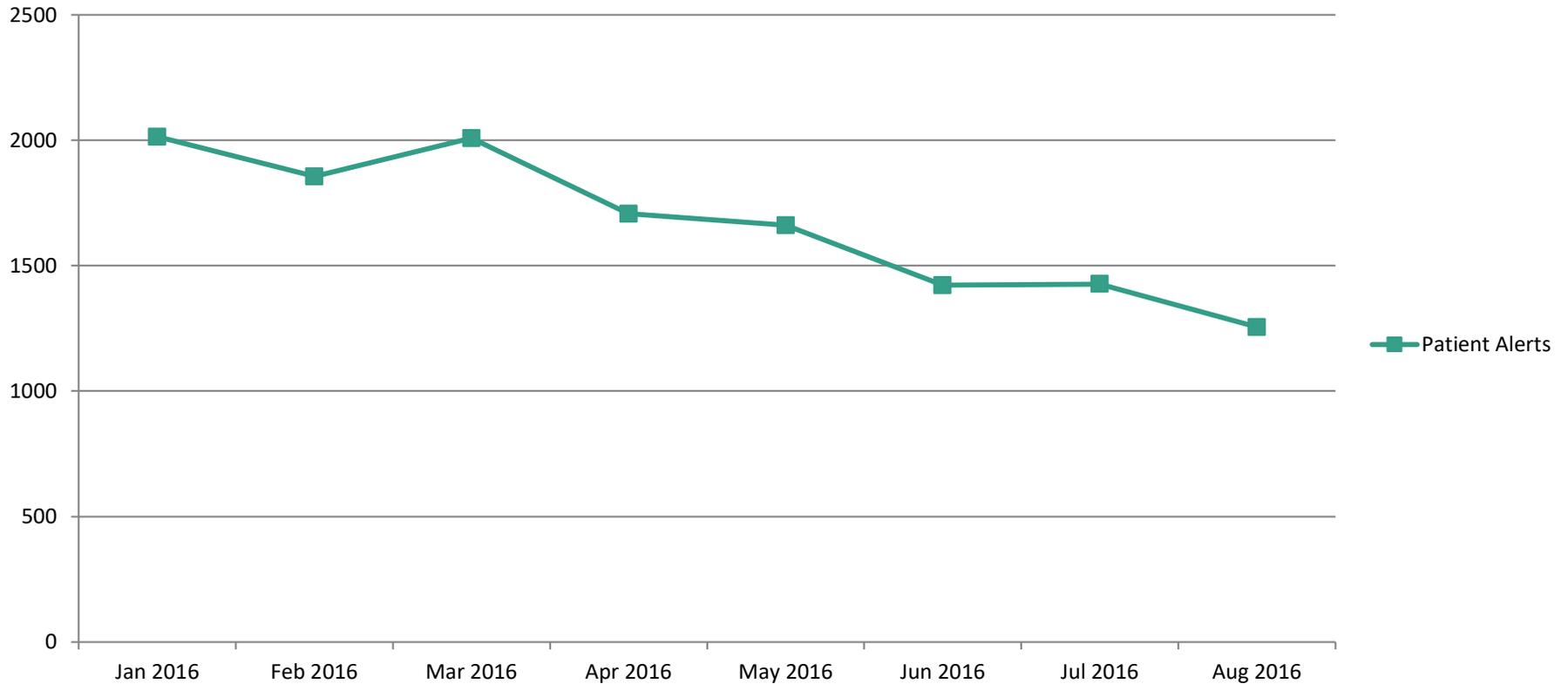
- Alerts for 57 Ascension Hospitals

Self-Assessment Question 1

Partnership between the following members is the key for success in antimicrobial stewardship activities?

Answer:

a. Pharmacists and physicians

b. Physicians and case managers

c. Physicians and housekeeping personnel

d. Pharmacists and case managers

Self-Assessment Question 2

Which of the following tool is critical to monitor success of a stewardship program?

Answer:

a. Antimicrobial usage data

b. Resistance trend

c. Compliance to guidelines/protocols

d. Patient care outcome data

e. All of the above

Self-Assessment Question 3

Prospective monitoring of antimicrobial use is critical for

Answer:

a. De-escalation

b. Discontinuation of therapy

c. Ensuring appropriate dose

d. Bug drug mismatch

e. All of the above

Key Takeaways

- Key Takeaway #1
  Physician-Pharmacist team work is key to the success of antimicrobial stewardship programs

- Key Takeaway #2
  Establishing evidence-based utilization indications, compliance tracking, and interventions are critical

- Key Takeaway #3
  Every facility needs to designate one physician and one pharmacist champion to ensure accountability