

---

ASCENSION TEXAS

# Antimicrobial Stewardship: Practical Implementation Strategies

Theresa Jaso, PharmD, BCPS (AQ-ID)  
Network Clinical Pharmacy Specialist Infectious Diseases  
Seton Healthcare Family  
Ascension Texas Antimicrobial Stewardship Lead  
August 10<sup>th</sup>, 2017



---

One Mission. One Integrated Ministry. One Ascension.



# Objectives

- Describe the CDC Core Elements of Hospital Antimicrobial Stewardship Programs
- Describe The Joint Commission Antimicrobial Stewardship Standard
- Identify 3 antimicrobial stewardship intervention strategies to improve antibiotic use
- Identify basic strategies for implementing an antimicrobial stewardship program in a small community hospital

# What is Antimicrobial Stewardship?

“***Good Antibiotic Stewardship*** is a practice that ensures the optimal selection, dose, and duration of an antimicrobial therapy that leads to the best clinical outcome for the treatment or prevention of an infection while producing the fewest toxic effects and the lowest risk for subsequent resistance.”

-Dale N. Gerding, MD

# Why is Antimicrobial Stewardship Important?

According to the Center for Disease Control (CDC), “20-50% of all antibiotics prescribed in U.S. acute care hospitals are either unnecessary or inappropriate.”

# Why is Antimicrobial Stewardship (AMS) Important?

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

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

*\*bacteria and fungus included in this report*

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

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

**= Patient Safety**

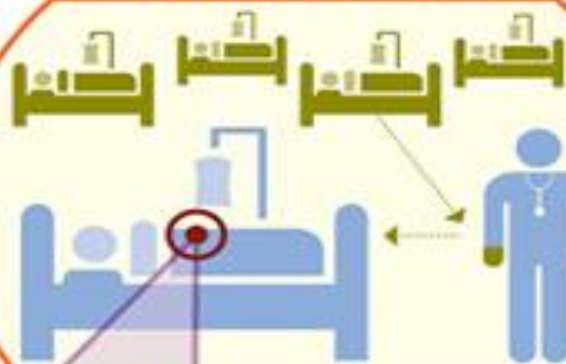
# Risk of CRE Infections

## 1. Local Short-Stay Hospital



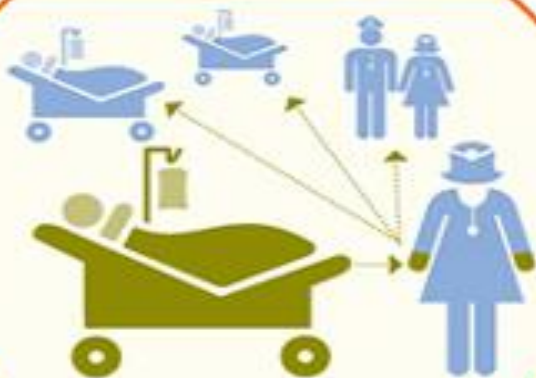
Jan has a stroke and is in the hospital. She is stable but needs long-term critical care at another facility.

## 2. Long-Term Acute Care Hospital



Other patients in this facility have CRE. A nurse doesn't wash his hands, and CRE are spread to Jan. She develops a fever and is put on antibiotics without proper testing.

## 3. Local Short-Stay Hospital



Jan becomes unstable and goes back to the hospital, but her new doctors don't know she has CRE. A doctor doesn't wash her hands after treating Jan. CRE is spread to other patients.

## How CRE Take Over

1. Lots of germs, 1 or 2 are CRE



2. Antibiotics kill off good germs



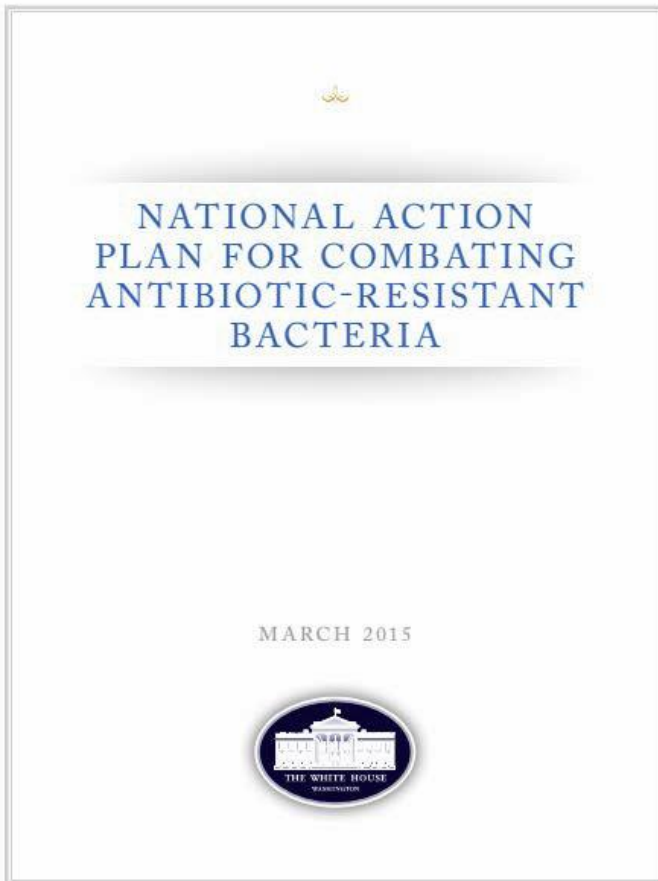
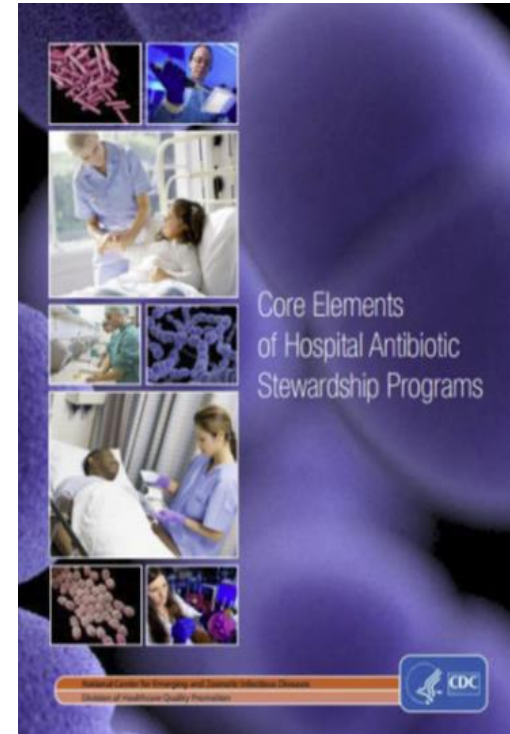
3. CRE grow



4. CRE share genetic defenses to make other bacteria resistant



# Antimicrobial Stewardship is a National Priority



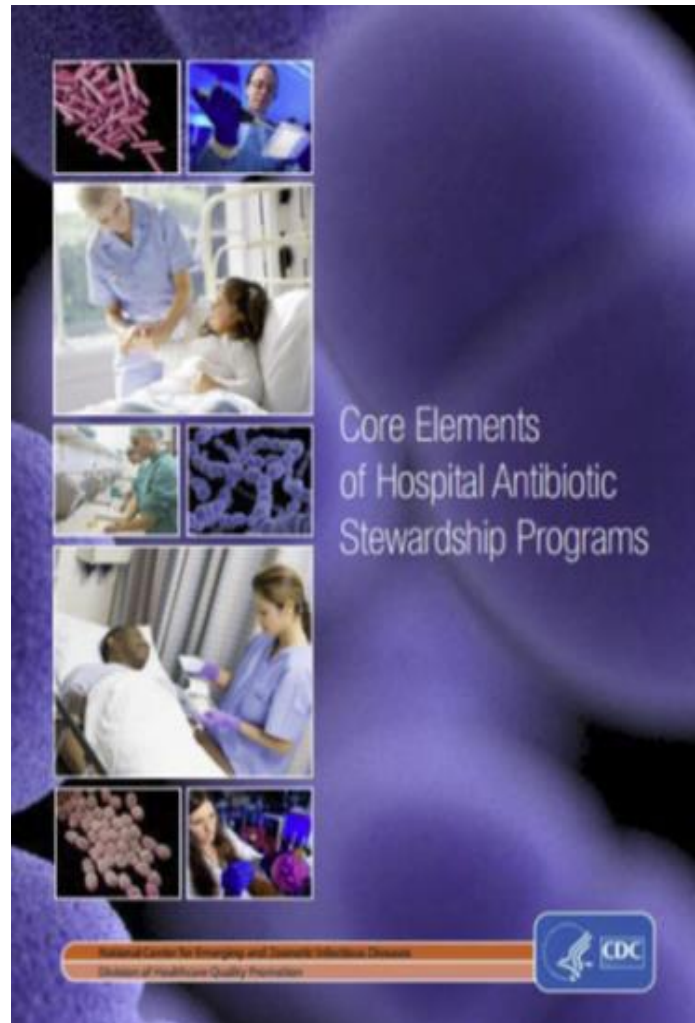
# 2020 Antimicrobial Stewardship Outcomes and Benchmarks



- Reduction of inappropriate antibiotic use
  - By 50% in the outpatient setting
  - By 20% in the inpatient setting
- 95% of Medicare – eligible hospitals will report antibiotic use and resistance data to the NHSN



# CDC Core Elements



# CDC Core Elements

Leadership Commitment: Dedicating resources

Accountability: Leader responsible for outcomes

Drug Expertise: Single pharmacist leader

Action: Support optimal antibiotic use

Tracking: Monitor antibiotic use and resistance

Reporting: Antibiotic use and resistance

Education: Clinicians, patients, and families

# The Joint Commission Standard Elements of Performance (EP) Effective January 1, 2017:

EP1

- Establish antimicrobial stewardship as an organizational priority

EP2

- Educate staff about antimicrobial stewardship and resistance

EP3

- Educate patients and families about the appropriate use of antimicrobials

EP4

- Establish a multidisciplinary antimicrobial stewardship team

# The Joint Commission Standard Elements of Performance (EP) Effective January 1, 2017:

EP5

- Include CDC's core elements in program design

EP6

- Follow organization-approved antimicrobial stewardship guidelines

EP7

- Collect, analyze, and report antimicrobial stewardship program data

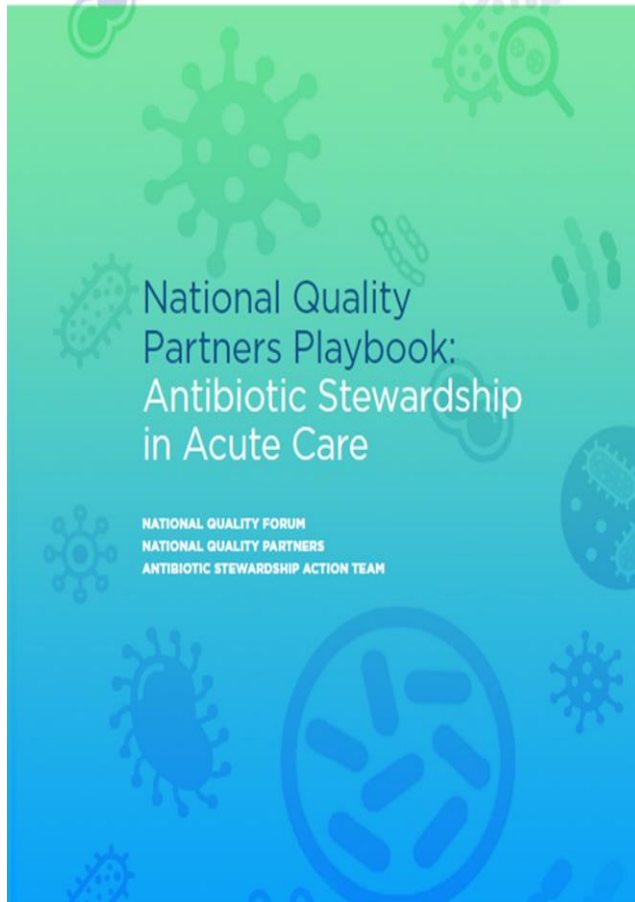
EP8

- Take action on improvement opportunities

# Value of Antimicrobial Stewardship Programs (ASPs)


- Decreased antibiotic days of therapy
- Lower use of high-cost antibiotics
- Switching IV antibiotics to oral antibiotics
- Reduced drug toxicity
- Reduced *Clostridium difficile* infections
- Reduced pneumonia readmissions

# How to Get Started




- Excellent resource
- Provides implementation examples for the CDC Core Elements
- Suggests solution to possible barriers
- References tools and resources

# Gap Analysis



Checklist for  
Core Elements  
of Hospital Antibiotic  
Stewardship Programs

National Center for Emerging and Zoonotic Infectious Diseases  
Division of Healthcare Quality Promotion



---

# Gap Analysis

- Leadership support
- Trained/experienced pharmacist
- Interested physician champion
- Clinical microbiologist
- IT support
- Quality
- Surveillance and reporting tools, antibiograms
- Guidelines, standing order sets



# Pharmacist Training

- Local staff development
- Corporate level programs
- Making a Difference in Infectious Diseases (MAD-ID) AMS Training Program
- Society of Infectious Diseases Pharmacists (SIDP) AMS Certificate
- Infectious Diseases Residency trained pharmacist

# Actions/Intervention Strategies

## Basic

IV to PO

Standing order sets

Guidelines/ Protocols

Indication & duration

Allergy assessment

## Intermediate

Renal dosing

Vancomycin &  
aminoglycoside  
dosing

Criteria for use

“Antibiotic time-out”  
at 48 – 72 hours

## Advanced

Antibiotic  
Streamlining

Timely and  
appropriate culture  
reporting

Real-time, rapid  
diagnostics

# Antibiotic Indication and Duration

Details for **cefTRIAxone**



Details



Order Comments



PRN reason:

\*Duration:

\*Duration unit:


Special Instructions:

\*Indications:

Freetext Indication:

# Antibiotic Indication and Duration

▼ Details for **cefTRIAxone**


Details
Order Comments



Remaining

PRN reason:	<input type="text"/>	▼	
<b>*Duration:</b>	<input type="text"/>		
<b>*Duration unit:</b>	<input type="text"/>	▼	
Special Instructions:	<input type="text"/>		
<b>*Indications:</b>	<input type="text"/>	▼	
Freetext Indication:	Empiric/Unknown Source		
<b>*Requested start date and time:</b>	Endocarditis		
Stop date and time:	Intra-abdominal		
Brand Name (Reference only):	Meningitis		
	Neonatal Fever		
	Pneumonia		
	SBP Prophylaxis		
	Sexually Transmitted Infection		
	UTI		
	Other		

CDT

3 Missing Required Details

Orders For

# Local Treatment Guidelines



## ADULT Inpatient Urinary Tract Infection Treatment Guideline (Including: cystitis, pyelonephritis)

Approved by the SHF Anti-infectives Monitoring Subcommittee (AIMS). These guidelines are not intended to replace clinical judgment

Disclaimer: The information within this document is specific to Seton Healthcare Family and is not intended for distribution or use at other healthcare institutions

adjustment for renal dysfunction  
or patient weight > 120 kg

### EMPIRIC TREATMENT OPTIONS

#### Not at Risk for MDR Organisms<sup>†</sup> (See below)

Common pathogens: *E. Coli*, *Proteus* spp., *Klebsiella* spp.,  
*Enterococcus* spp. (less common)\*

Preferred: **Cefazolin 1 G IV Q12H** (pyelonephritis: **2 G IV Q8hrs**)  
(SHF urinary isolates: comparable susceptibility to ceftriaxone<sup>^</sup>)

OR

**Ampicillin/sulbactam 1.5 G IV Q6H + Gentamicin IV** per SHF Guideline  
(if a Gram-positive organism is suspected)

<sup>^</sup> The antibiogram includes all isolates collected (e.g. all sites and risk for MDR). Cefazolin provides much higher urinary concentrations with comparable susceptibility to ceftriaxone for SHF urinary isolates.

#### At Risk for MDR Organisms<sup>†</sup> (See below) OR Critically ill

Common pathogens: Non-MDR organisms plus: *Citrobacter* spp  
*Enterobacter* spp., *Pseudomonas* spp.

**Cefepime 1 G IV Q12H**

OR

**Piperacillin/tazobactam 2.25 G IV Q8H** (4 hour infusion)

#### ♦ Risk Factors for Multi-Drug Resistant (MDR) Organisms:

- Broad spectrum antibiotic treatment in last 90 days

(including fluoroquinolones & 3<sup>rd</sup> generation cephalosporins)

# Small Community Hospitals

- 20% of the U.S. population resides in rural areas
- 73% of U.S. hospitals < 150 beds
- 10% < 25 beds
- Many have critical access hospital (CAH) designation

# Small Community Hospitals

- Limited data on antibiotic use trends
- CDC point prevalence survey
  - Similar prescribing patterns small vs. large hospital
- Similar or higher rates of *C. difficile* infection and resistant bacteria vs. large hospitals
- CDC survey (2015)
  - < 200 beds: only 49% met all 7 AMS Core Elements
  - > 200 beds: 66% met all 7 Core Elements
  - CAH: 31%

# Barriers to Implementing an ASP: Small Community Hospitals

- No Infectious Diseases (ID) physician
- Pharmacists lack ID specialty training
- Lack of pharmacist time
- No IT support
- Outside microbiology lab



# The Stewardship Team – Small Community Hospitals

## ID Physician

- Part – time support
- Resource sharing or contracting
- May not be possible in isolated rural areas
- Leadership may be corporate or regional level

# The Stewardship Team – Small Community Hospitals

## ID Pharmacist

- Pair up with larger “sister” hospitals
- Kaiser Permanente paired small hospital with a larger medical center
  - Developed business plan to share ID pharmacist for both sites
- **Seton Healthcare Family – Ascension TX**
  - 3 ID pharmacy specialists provide ASP services for all 12 hospitals
  - Ascension TX Antimicrobial Stewardship Committee

# Telehealth

## Intermountain Healthcare Antimicrobial Stewardship TeleHealth Program

- Network 22 hospitals, 16 with < 150 beds
- Small hospitals responsible for their ASP
- Centralized TeleHealth team provides remotely:
  - Data
  - Mentorship
  - ID consultation

# Other Leadership Resources

- State Health Department
- Collaborative efforts
  - Hospital Improvement and Innovation Networks
  - Example: Colorado Hospital Association (CHA)
- Commercial telehealth support

# The Stewardship Team – Small Community Hospitals

Non ID –trained physicians and pharmacists

- Identify a well-respected site leader
- Appropriate training in AMS principles is critical
  - Society for Healthcare Epidemiology of America (SHEA) AMS Training Course
  - Infectious Diseases Society of America (IDSA) “Best Practices for Antimicrobial Stewardship Programs” workshop – IDWeek
  - MAD-ID AMS Training Program

# Other AMS Team Players

- Infection Prevention
- Hospital Administration
- Quality Improvement
- Information Technology
- Nursing
- AMS committee can be subcommittee of P&T or part of the Infection Prevention committee

# Protect Time for Stewardship Activities

- Prioritize duties: CHF, ASP
- Start with one unit and expand
- Basic: IV to PO, renal dosing, guidelines
- Intermountain: dedicated time for ASP activities
  - Hospitals < 70 beds: average < 5 hours/ week
  - Hospitals 70 – 150 beds: average 5-10 hours/ week

# Outcomes Measurement

## Antibiotic Usage Data

- Days of Therapy (DOT)/ 1000 patient days
  - CDC /NHSN Antibiotic Use and Resistance (AUR) Module
  - Can use third-party vendor to submit data
- Defined Daily Doses (DDD)/ 1000 patient days
  - Can be calculated with purchase, dispensed or administered data
- Antibiotic prescribing data
  - Focus on specific disease states; e.g. UTI, pneumonia



# Antibiogram

- Up - to - date antibiogram essential
  - For developing hospital-specific guidelines
  - For understanding resistance patterns
- Small hospitals often lack enough clinical isolates
- Can collaborate with state department
- Extrapolate data from regional facility
- Include ED and outpatient clinical isolates

# ASPs Require Leadership Support

- Financial support
  - Contracting ID leadership
  - Funding for ASP training
  - IT resources
- Work with hospital financial department to develop business case
- Small hospitals require fewer resources

# Successful ASP in a Rural Community Hospital

- 70 - bed hospital rural Virginia
- ID physician hired to establish/lead an ASP
- ID physician traveled to hospital once weekly
  - Reviewed medical charts of patients on antibiotics
  - Face to face recommendations: providers and staff
  - Chair of Infection Prevention and P&T member
  - Available by pager most days of the year
- No formal consults performed
- Improved *Pseudomonas aeruginosa* susceptibilities; decreased antibiotic use and cost

# Successful ASP in a Rural Community Hospital

- Rural health system in Georgia
- Census < 100 patients
- ID physician joined staff ( 2<sup>nd</sup> quarter 2014)

# Successful ASP in a Rural Community Hospital

ASP team:

- ID physician champion (0.25 FTE)
- 2 lead pharmacists
- Infection prevention nurse
- Microbiology supervisor

# Successful ASP in a Rural Community Hospital

- ASP core strategy: post-prescriptive audit with feedback
- Focused on 12 antimicrobials
- Pre-ASP implementation Grand Rounds lecture series with guidelines and algorithms
- Daily review/ feedback under ID physician supervision

# Successful ASP in a Rural Community Hospital - Outcomes

- Hospital acquired *C. difficile* infections declined:  
3.35 cases/1000 occupied bed days (end 4<sup>th</sup> Qtr 2013) to  
1.35 cases/1000 ( 4<sup>th</sup> Qtr 2015) ( $p < 0.001$ )
- Targeted antimicrobial costs decreased 50%
- Use of all antimicrobials decreased by 10%  
126.7 DDDs/1000 Pt Days to 115 DDDs/1000 Pt Days ( $p < 0.001$ )
- Annual savings \$280,000

# Conclusions

- Antimicrobial stewardship = patient safety priority
- Joint Commission Standard – January 1, 2017
- Small hospitals can develop successful ASPs
- Hospital leadership support is essential
- Utilize resources



# Resources

- CDC Core Elements of Antimicrobial Stewardship Programs  
<https://www.cdc.gov/getsmart/healthcare/implementation/core-elements.html>
- ASHP Antimicrobial Stewardship Resources  
<https://www.ashp.org/pharmacy-practice/resource-centers/inpatient-care/antimicrobial-stewardship>
- MAD – ID: Making a Difference in Infectious Diseases  
<http://mad-id.org/>
- SIDP: Society of Infectious Diseases Pharmacists  
<https://www.sidp.org/>
- SHEA: Society for Healthcare Epidemiology of America  
<http://www.shea-online.org/>
- IDSA: Infectious Diseases Society of America  
<https://www.idsociety.org/Index.aspx>

# Pearls

- Start slow
- Set achievable goals
- Utilize resources
- Send your lead ASP physician and pharmacist to conferences- IDSA, SHEA, MAD-ID
- Develop a collegial environment for providers
- Educate
- Be patient, changing behavior takes time
- Provide positive feedback on your successes

# BAD BUGS, NO DRUGS

As Antibiotic Discovery Stagnates ...  
A Public Health Crisis Brews

GUIDELINES



## Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America Guidelines for Developing an Institutional Program to Enhance Antimicrobial Stewardship

Timothy H. Dellit,<sup>1</sup> Robert C. Owens,<sup>2</sup> John E. McGowan, Jr.,<sup>3</sup> Dale N. Gerding,<sup>4</sup> Robert A. Weinstein,<sup>5</sup>  
John P. Burke,<sup>6</sup> W. Charles Huskins,<sup>7</sup> David L. Paterson,<sup>8</sup> Neil O. Fishman,<sup>9</sup> Christopher F. Carpenter,<sup>10</sup> P. J. Brennan,<sup>9</sup>  
Marianne Billeter,<sup>11</sup> and Thomas M. Hooton<sup>12</sup>

Antimicrobial Stewardship Guidelines • CID 2007:44 (15 January) • 161

*Clinical Infectious Diseases*

IDSA GUIDELINE



July 2004

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

Tamar F. Barlam,<sup>1,a</sup> Sara E. Cosgrove,<sup>2,a</sup> Lilian M. Abbo,<sup>3</sup> Conan MacDougall,<sup>4</sup> Audrey N. Schuetz,<sup>5</sup> Edward J. Septimus,<sup>6</sup> Arjun Srinivasan,<sup>7</sup> Timothy H. Dellit,<sup>8</sup>  
Yngve T. Falck-Ytter,<sup>9</sup> Neil O. Fishman,<sup>10</sup> Cindy W. Hamilton,<sup>11</sup> Timothy C. Jenkins,<sup>12</sup> Pamela A. Lipsett,<sup>13</sup> Preeti N. Malani,<sup>14</sup> Larissa S. May,<sup>15</sup>  
Gregory J. Moran,<sup>16</sup> Melinda M. Neuhauser,<sup>17</sup> Jason G. Newland,<sup>18</sup> Christopher A. Ohl,<sup>19</sup> Matthew H. Samore,<sup>20</sup> Susan K. Seo,<sup>21</sup> and Kavita K. Trivedi<sup>22</sup>

Guideline for Implementing an Antibiotic Stewardship Program • CID 2016:62 (15 May) • e51