

EXPLORING INFECTION PREVENTION AND PHARMACY COLLABORATION IN ANTIMICROBIAL STEWARDSHIP

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Financial Disclosure

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Objectives

Discuss the impact antibiotic resistance and associated infections on the healthcare system

Review the current state of antimicrobial stewardship and its impact on healthcare outcomes and costs

Discuss the structure and core elements of antimicrobial stewardship and describe the current role of Infection Prevention (IP) in this effort

Identify opportunities to build a stronger collaboration between IP and Pharmacy for future success

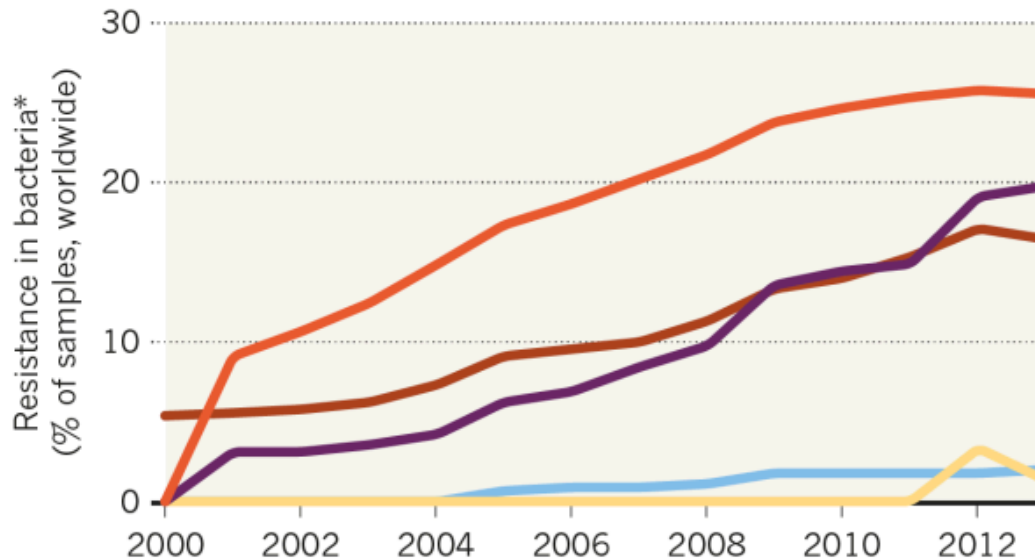


The Bigger Picture

THE SPREAD OF ANTIBIOTIC RESISTANCE

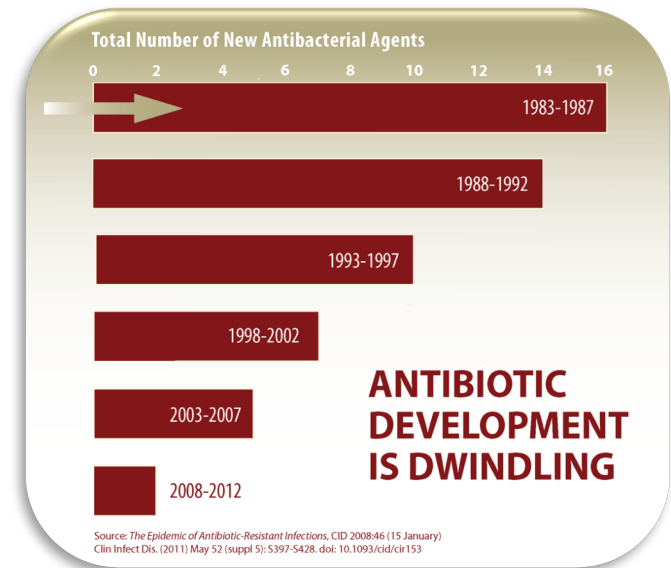
An increasing proportion of bacteria display resistance to common antibiotics.

- Fluoroquinolones
- Cephalosporins (3rd gen)
- Aminoglycosides
- Carbapenems
- Polymyxins



*Enterobacteriae, including *Escherichia coli*, *Klebsellia pneumonia*, *Enterobacter* and *Salmonella*

©nature



Source: *The Epidemic of Antibiotic-Resistant Infections*, CID 2008;46 (15 January) Clin Infect Dis. (2011) May 52 (suppl 5):S397-S428. doi: 10.1093/cid/cir153



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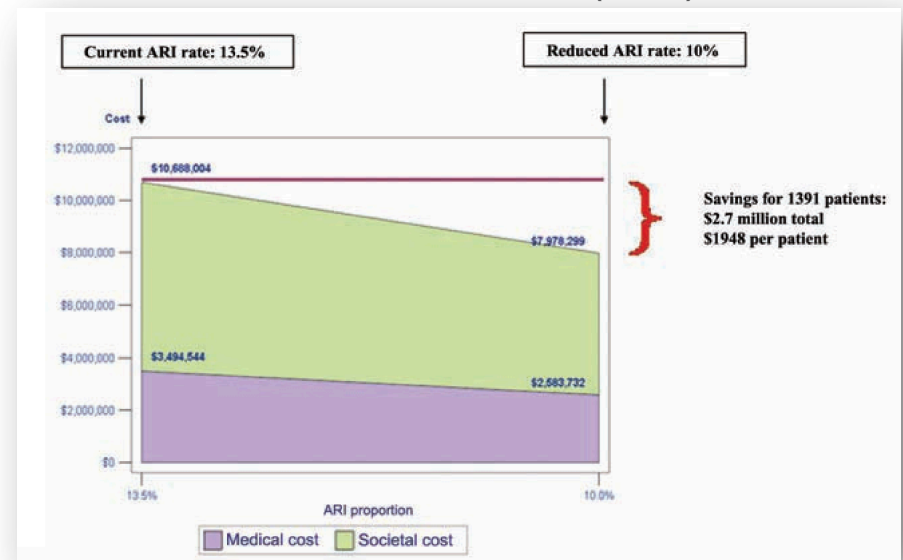
<http://www.nature.com/news/spread-of-antibiotic-resistance-gene-does-not-spell-bacterial-apocalypse-yet-1.19037>

Hospital and Societal Costs of Antimicrobial-Resistant Infections

Chicago Antimicrobial Resistance Project (CARP)

- Attributable mortality: 6.5%
- Excess hospital LOS: 6.4–12.7 days
- Attributable medical costs: \$18,588–\$29,069/patient
- Societal costs: \$10.7–\$15.0 million

PROJECTED COST SAVINGS WITH REDUCTION OF ANTIMICROBIAL-RESISTANT INFECTION (ARI) RATES



CID 2009;49(8):1175-1184



Our Current State

Approximately 1/3 of all hospitalized patients and 2/3 of those who are critically ill receive antimicrobial therapy

Up to 50% of antibiotic use inappropriate and/or unnecessary

2 million infected annually with resistant organisms in the United States with 23,000 attributed deaths

National Action Plan for Combating Antibiotic-Resistant Bacteria (2015)

- Establishment of ASPs in all acute care hospitals by 2020
- Centers for Medicare and Medicaid Services to issue a Condition of Participation for development of programs based on recommendations from the Centers for Disease Control and Prevention's (CDC) Core Elements of Hospital Antibiotic Stewardship Programs

CID 2007; 29: 245 - 252

JAMA 2009; 302: 2323 - 2329

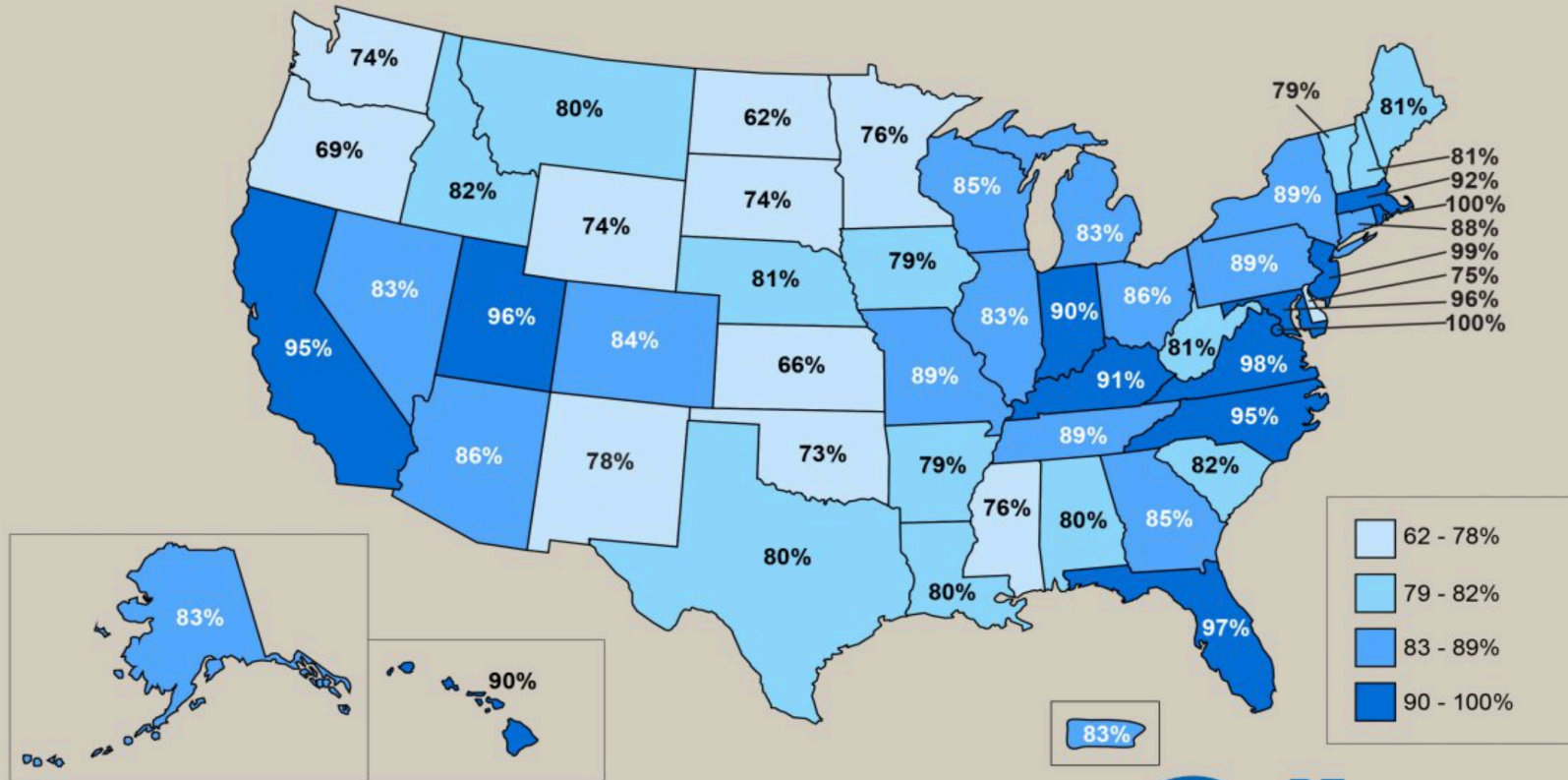
<https://www.cdc.gov/drugresistance/>

<https://obamawhitehouse.archives.gov/>



Percentage of Hospitals Meeting all 7 Core Elements of Hospital Antibiotic Stewardship Programs* by State, 2018

Nationally, 84.8% of hospitals have met all 7 Core Elements (4,233 of 4,989); the national goal is 100% of hospitals by 2020.



*More information on CDC's Core Elements of Hospital Antibiotic Stewardship Programs can be found at:

<https://www.cdc.gov/antibiotic-use/core-elements/hospital.html>

Source: CDC's National Healthcare Safety Network (NHSN) Survey

19-312162-A



**BE
ANTIBIOTICS
AWARE**
SMART USE, BEST CARE



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CMS Final Rule on Antibiotic Stewardship Programs

Oct. 18, 2019

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On September 30, CMS released a final rule that addresses antibiotic stewardship programs. This rule “Regulatory Provisions to Promote Program Efficiency, Transparency, and Burden Reduction; Fire Safety Requirements for Certain Dialysis Facilities; Hospital and Critical Access Hospital (CAH) Changes To Promote Innovation, Flexibility, and Improvement in Patient Care,” was first proposed in 2016. The rule requires all acute-care hospitals that participate in Medicare or Medicaid to develop and implement an antibiotic stewardship program as part of their infection control efforts. Two sections, § 482.42(b) and § 485.640(b), regarding hospital and critical access hospital (CAH) antibiotic stewardship programs must be implemented by March 30, 2020.

<https://www.asm.org/Articles/Policy/CMS-Final-Rule-on-Antibiotic-Stewardship-Programs>



Antimicrobial Stewardship

Antimicrobial stewardship refers to coordinated interventions designed to improve and measure the appropriate use of antimicrobials

Promotes the selection of the optimal antimicrobial drug regimen, dose, duration of therapy, and route of administration

Primary Goal:

- Optimize clinical outcomes
- Minimize unintended consequences of antimicrobial use

Secondary Goal:

- Reduced healthcare costs

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,¹ Robert C. Owens,² John E. McGowan, Jr.,³ Dale N. Gerding,⁴ Robert A. Weinstein,⁵ John P. Burke,⁶ W. Charles Huskins,⁷ David L. Paterson,⁸ Neil O. Fishman,⁹ Christopher F. Carpenter,¹⁰ P. J. Brennan,⁹ Marianne Billeter,¹¹ and Thomas M. Hooton¹²

Clinical Infectious Diseases

IDSA GUIDELINE



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

Tamar F. Barlam,^{1,4} Sara E. Cosgrove,^{2,8} Lillian M. Abbo,³ Conan MacDougall,⁴ Audrey N. Schuetz,⁵ Edward J. Septimus,⁶ Arjun Srinivasan,⁷ Timothy H. Dellit,⁹ Yngve T. Falck-Ytter,⁹ Neil O. Fishman,¹⁰ Cindy W. Hamilton,¹¹ Timothy C. Jenkins,¹² Pamela A. Lipsitt,¹³ Preeti N. Malani,¹⁴ Larissa S. May,¹⁵ Gregory J. Moran,¹⁶ Melinda M. Neuhauser,¹⁷ Jason G. Newland,¹⁸ Christopher A. Ohl,¹⁹ Matthew H. Samore,²⁰ Susan K. Seo,²¹ and Kavita K. Trivedi²²



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CID 2007; 44: 159 - 177
CID 2016 ; 62 : 51 -77

Impact of Antimicrobial Stewardship

Outcomes:

Approximate 20% decrease in antimicrobial consumption

Effect doubled in ICU

Additional reductions:

Cost

Length of stay

Resistant infections (i.e. MRSA, *P. aeruginosa*, ESBLs)

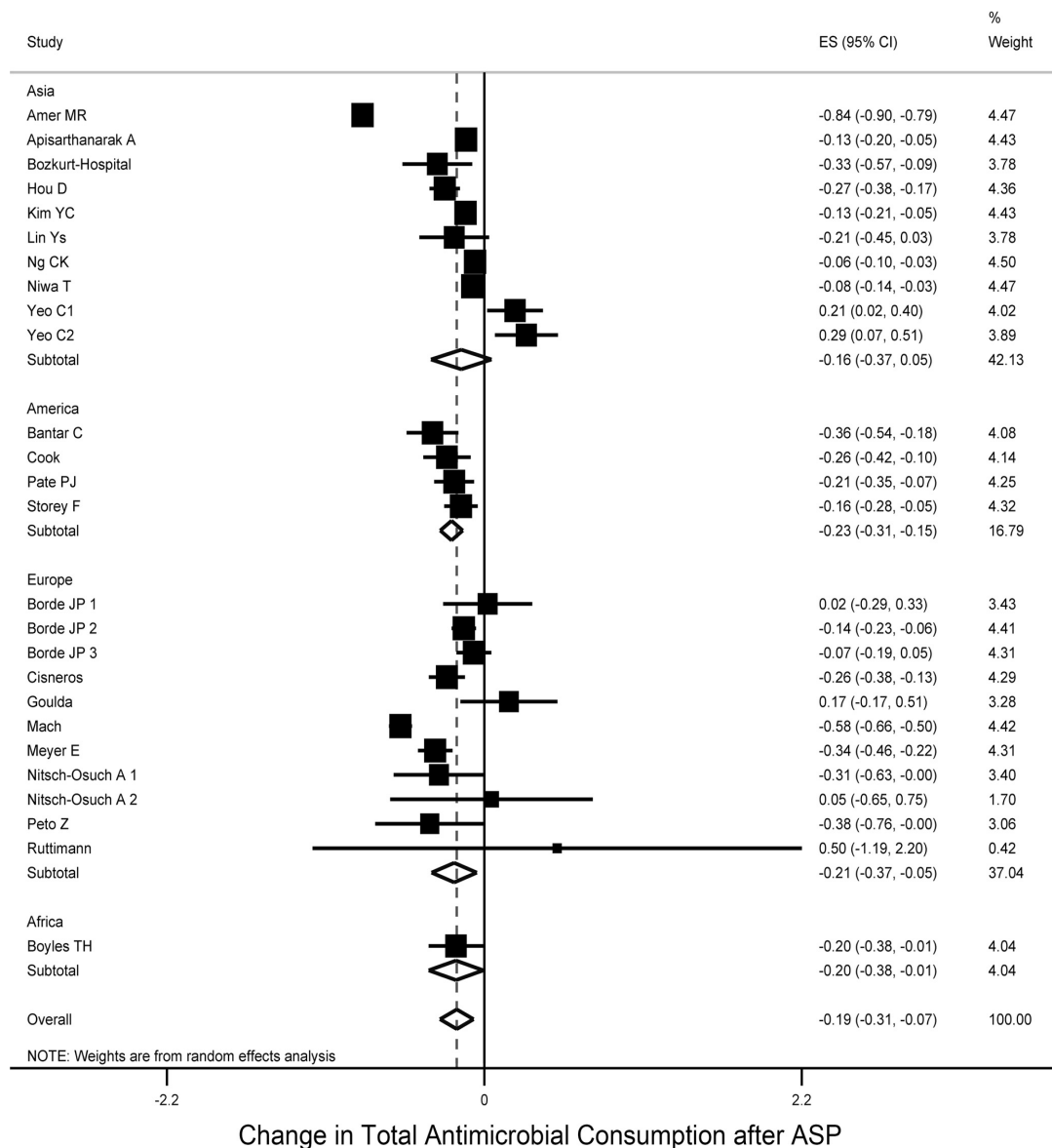


FIG 2 Forest plot of included studies stratified by continent. Individual and combined change of total antimicrobial consumption after ASP implementation among studies conducted in hospital settings.

Core Elements of Hospital Antibiotic Stewardship Programs



Hospital Leadership Commitment

Dedicate necessary human, financial, and information technology resources.



Accountability

Appoint a leader or co-leaders, such as a physician and pharmacist, responsible for program management and outcomes.



Pharmacy Expertise (previously “Drug Expertise”):

Appoint a pharmacist, ideally as the co-leader of the stewardship program, to help lead implementation efforts to improve antibiotic use.



Action

Implement interventions, such as prospective audit and feedback or preauthorization, to improve antibiotic use.



Tracking

Monitor antibiotic prescribing, impact of interventions, and other important outcomes, like *C. difficile* infections and resistance patterns.



Reporting

Regularly report information on antibiotic use and resistance to prescribers, pharmacists, nurses, and hospital leadership.



Education

Educate prescribers, pharmacists, nurses, and patients about adverse reactions from antibiotics, antibiotic resistance, and optimal prescribing.



Antimicrobial Stewardship + Infection Prevention



“Your problem is to bridge the gap which exists between where you are now and the goal you intend to reach.” -Earl Nightingale



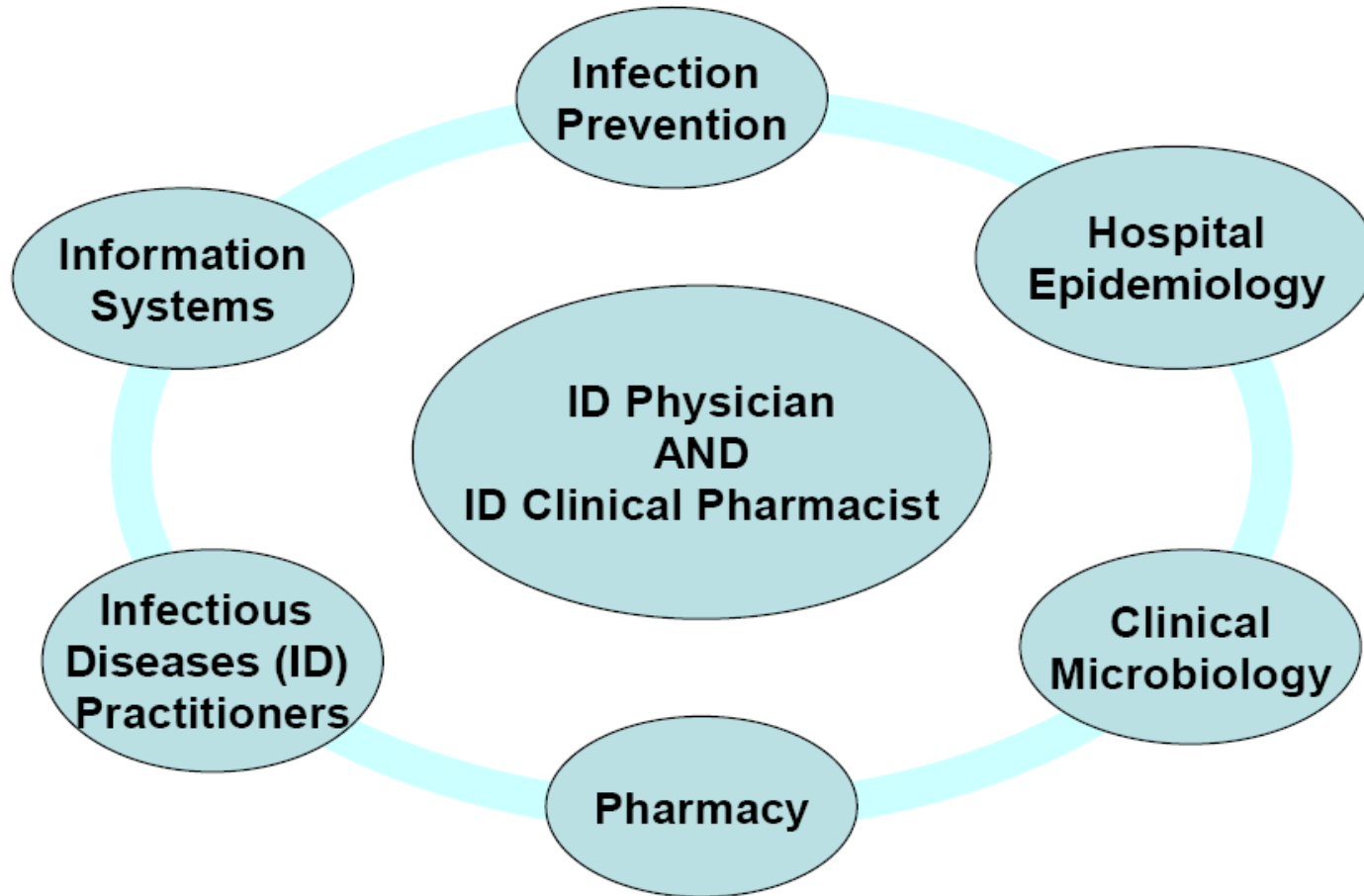
APIC-SHEA Position Paper

“Antimicrobial stewardship programs (ASPs) can benefit infection prevention & control (IPC) programs by identifying reported trends and outbreaks of epidemiologically significant organisms and educating about infection prevention policies in the course of interaction with providers.”

“IPs and HEs benefit ASPs by providing support and guidance in approaches to surveillance for syndromes of interest, implementing interventions to guide the delivery of evidence-based practices, and translating data and infection rates to health care workers, nursing units, and administrators.”



Typical Program Structure



Available Resources and Team Building

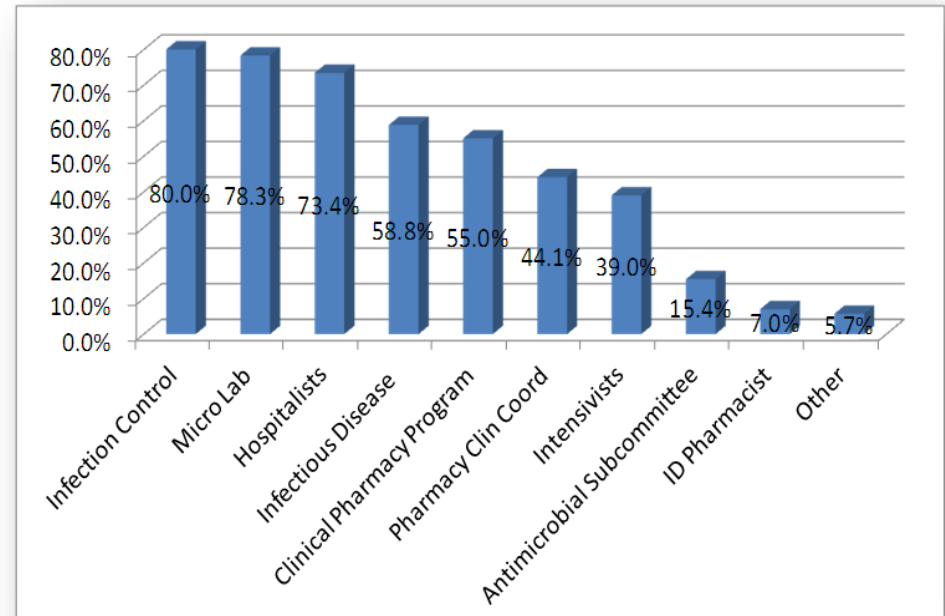
Resources often limited

- Infectious Diseases Specialists
- ID Pharmacists

Necessary key elements

- Senior leadership support
- Strong physician champion
- Specialized training and/or competencies (i.e. pharmacy, infection preventionist, microbiology, information technology)
- Teamwork

HealthTrust Purchasing Group Survey Results: Current Antimicrobial Stewardship Program Use and Resources



CID 2011; 53: S8 – S14



Exploring IPs Role in AS

Expert telephone interviews using a validated survey tool conducted 11/1/16 – 12/12/16 (n = 28)

Objectives:

1. Assess multidisciplinary perspectives of IPs' contributions to ASPs
2. Identify perceived barriers to optimal participation of IPs in ASPs



Contents lists available at [ScienceDirect](#)

American Journal of Infection Control

journal homepage: www.ajicjournal.org



Brief Report

Exploring the role of infection preventionists in antimicrobial stewardship programs through several lenses: A brief report

Matthew Weissenbach MPH, CPH, CIC ^{a,*}, Donna Haiduven PhD, RN, CIC, CPH ^a,
Salah S. Qutaishat PhD, CIC, FSHEA, FAPIC ^b

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Am J Infect Control 2020; 48:106 - 107

Barriers to IP Involvement in AS

MOST COMMONLY CITED:

AS as a lower priority (58%)

Time constraints (54%)

IP staffing levels (46%)

Communication difficulties (46%)

Table 1
Barriers to IP involvement in ASPs by participant role (n = 24)

Barriers	n (%)
Deficiencies in antimicrobial stewardship knowledge	10 (42)
IP	4 (16)
Pharmacist	3 (13)
Physician	3 (13)
Political/social tensions in the hospital	9 (38)
IP	3 (13)
Pharmacist	1 (4)
Physician	5 (21)
Time constraints	13 (54)
IP	5 (21)
Pharmacist	5 (21)
Physician	3 (13)
AMS is a lower priority relative to competing activities or demands	14 (58)
IP	4 (17)
Pharmacist	4 (17)
Physician	6 (25)
IP staffing levels	11 (46)
IP	4 (17)
Pharmacist	4 (17)
Physician	3 (13)
Communication difficulties between concerned groups	11 (46)
IP	3 (13)
Pharmacist	3 (13)
Physician	5 (21)
Outside of IP role definition "It's not my job"	8 (33)
IP	2 (8)
Pharmacist	2 (8)
Physician	4 (17)
No barriers exist	5 (21)
IP	2 (8)
Pharmacist	2 (8)
Physician	1 (4)

For n = 24, items were multiselected, resulting in some participants selecting no barriers and some more than 1 barrier.

AMS, antimicrobial stewardship; ASPs, antimicrobial stewardship programs; IP, infection preventionist.

Am J Infect Control 2020; 48:106 - 107



Summary of Survey Results

Most non-IP clinician peer groups expect IP involvement to focus mostly on contributing data on rates of *Clostridium difficile* infection and multidrug-resistant pathogens

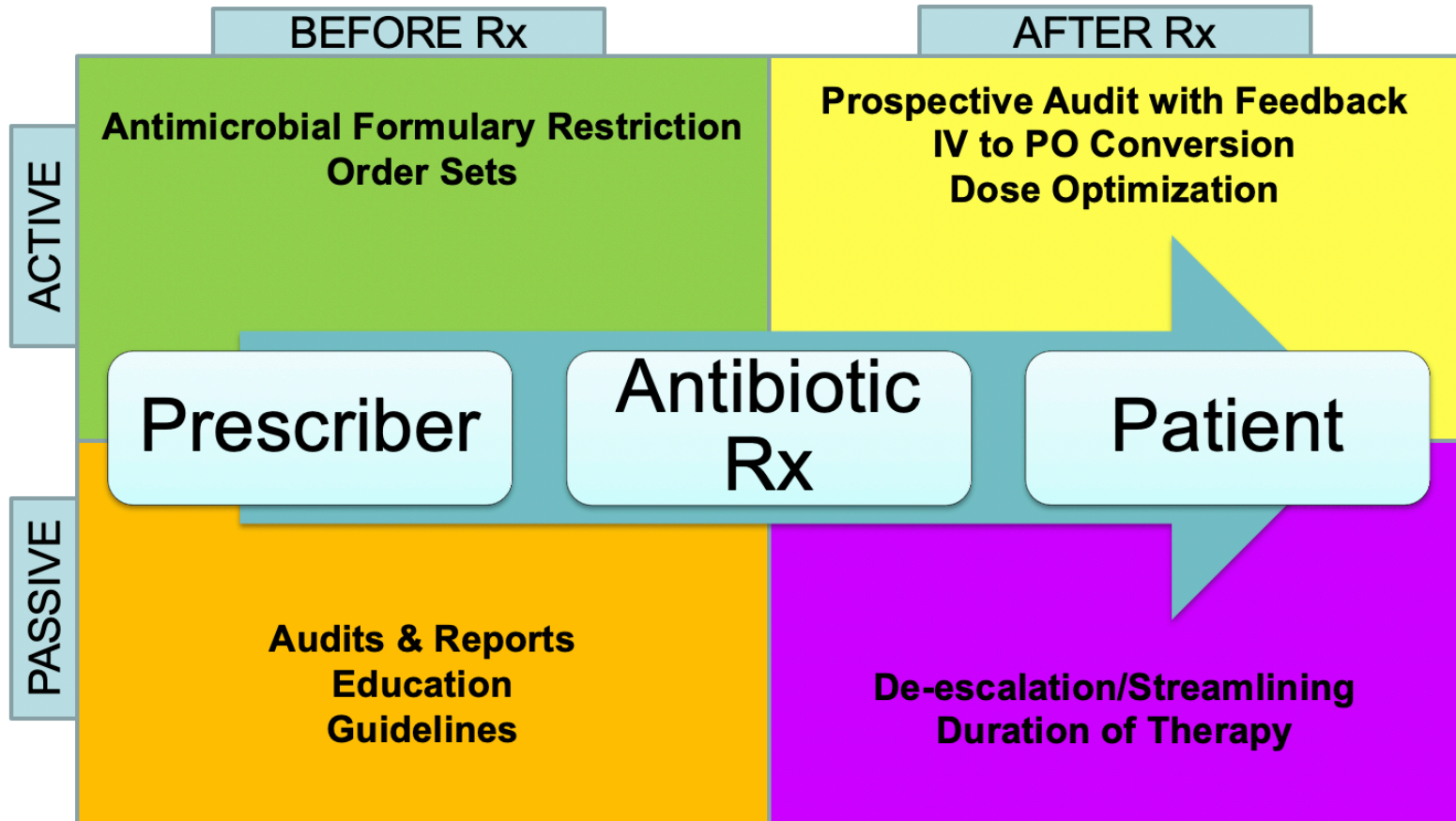
Little expectation for IP involvement in patient-level review, consultation, and intervention

Hospital executives viewed IP involvement as “necessary” and “supportive” to the mission of their ASP

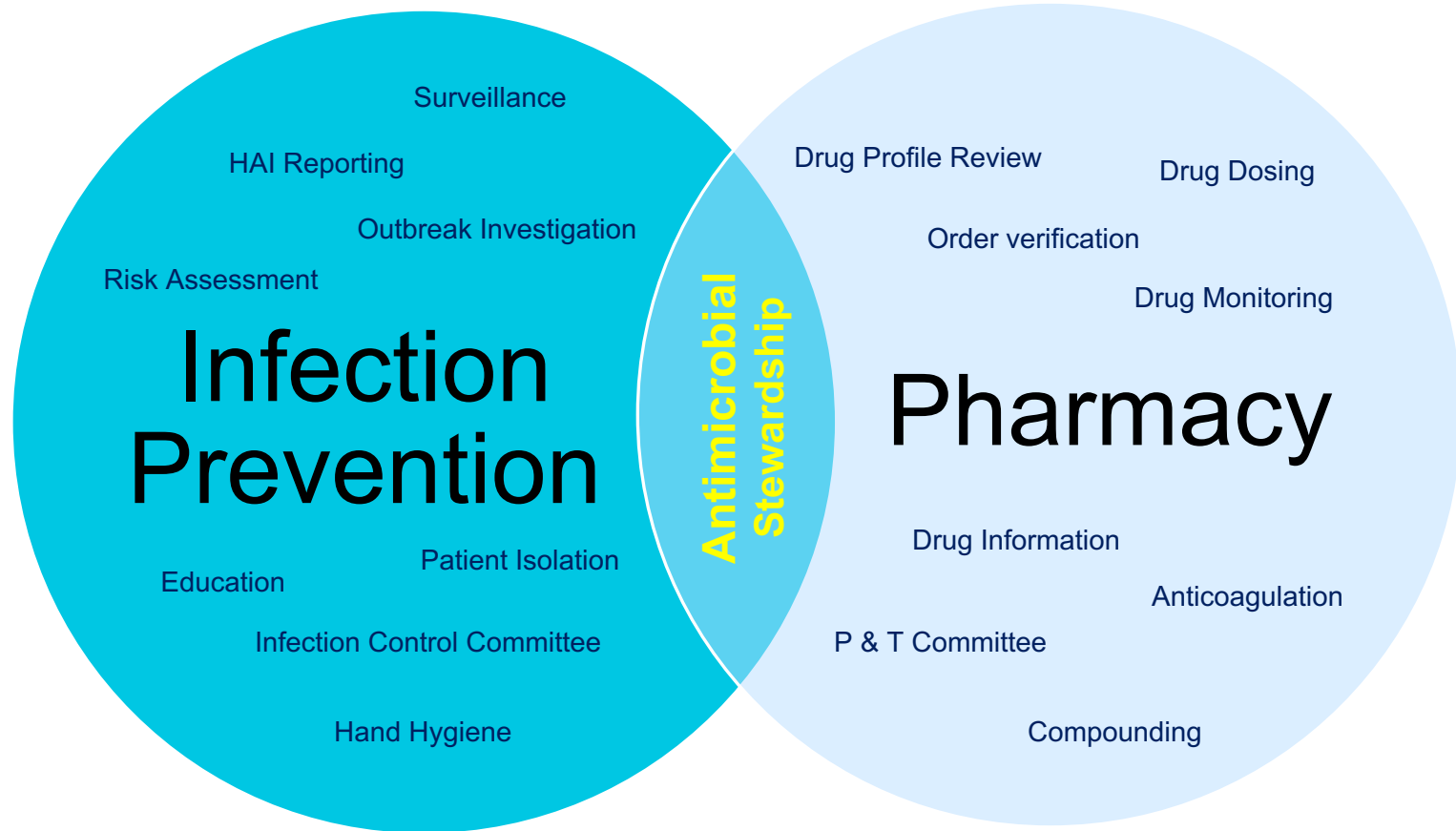
“Additionally, the absence of a role definition for IPs in ASPs is likely hindering IPs from contributing in consistent, meaningful ways.”



Antimicrobial Stewardship Strategies



FOCUS: Pharmacy & Infection Prevention



Core Elements Revisited

Core Elements of Hospital Antibiotic Stewardship Programs



Hospital Leadership Commitment

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Tracking

Monitor antibiotic prescribing, impact of interventions, and other important outcomes, like *C. difficile* infections and resistance patterns.



Reporting

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Education

Educate prescribers, pharmacists, nurses, and patients about adverse reactions from antibiotics, antibiotic resistance, and optimal prescribing.



Hospital Leadership

System leaders must prioritize IP and AS

Partnership can increase influence and the ability to obtain necessary program resources

Focused initiatives with clear goals

- Impact the quality of care
- Mutual benefit
- Cost savings
- Examples: CDI rate reduction, decreased LOS for MDRO admits, surgical prophylaxis

Report stewardship activities and to senior leadership and the hospital board on a regular basis

“One Voice, One Mission.”



Viewpoint: Outcomes and Metrics

Cubist sponsored survey conducted in March 2012

- 55- question online survey based on IDSA/SHEA ASP guidelines
- E-mailed to 94 physicians or pharmacists in acute care hospitals in the United States
- 51% response rate (48 institutions in 29 states)

Table 3. Respondents' Opinion of Most Important Antimicrobial Stewardship Program Outcomes Based on Audience and Those Collected as Metrics (n = 41)

Outcome ^a	Collected by Respondents as ASP Metric	Most Important	Hospital Administrator Perceived Most Important ^b	Pharmacy Director Perceived Most Important ^b	P&T Committee Perceived Most Important ^b	ID Physician Perceived Most Important ^b
Antimicrobial use	30 (73)	6 (15)	1 (2)	9 (22)	13 (32)	1 (2)
Antimicrobial cost	30 (73)	4 (10)	17 (41.5)	23 (56)	6 (15)	0 (0)
Appropriateness of antimicrobial use	21 (51)	23 (56)	2 (4.9)	2 (5)	6 (15)	11 (27)
Infection-related mortality rate	3 (7)	14 (34)	1 (2)	2 (5)	1 (2)	15 (37)
Infection or antibiotic-associated length of stay	5 (12)	9 (22)	2 (4.9)	0 (0)	1 (2)	3 (7)

Abbreviations: ASP, antimicrobial stewardship program; ID, infectious disease; P&T, pharmacy and therapeutics.

^a Respondents could select >1 outcome.

^b Respondents selected outcomes that they perceived to be the most important to this audience.

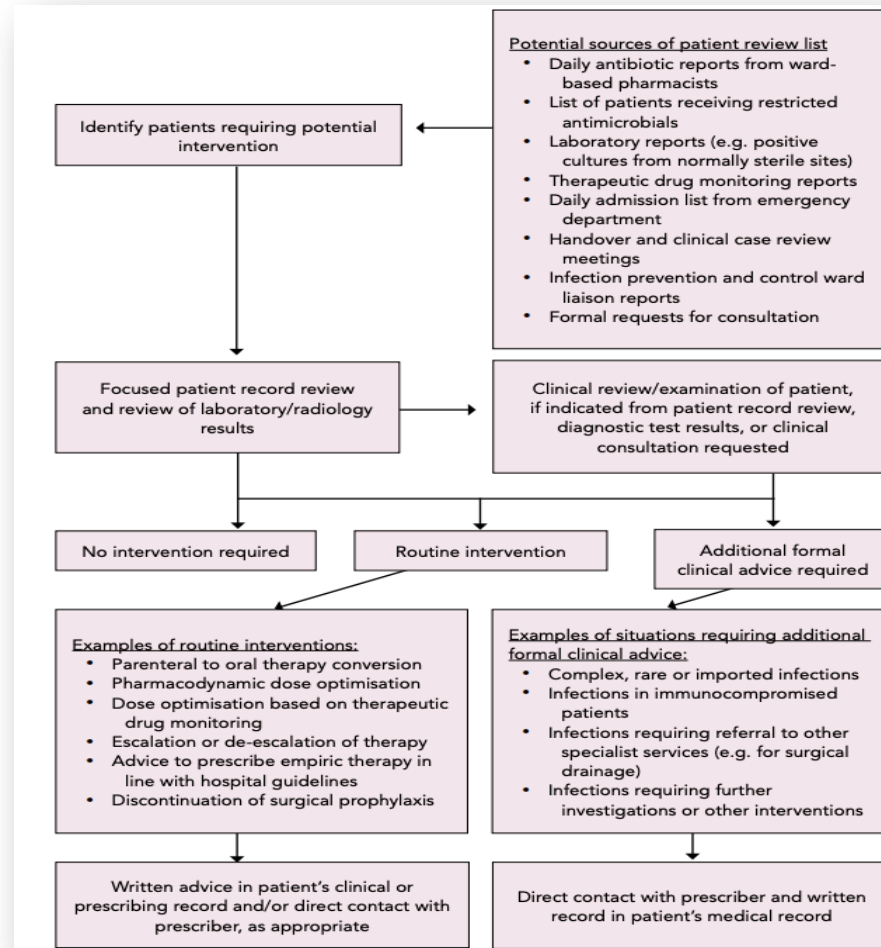
Bumpass, JB, et al. CID 2014;59(S3):S108–11



Action

Example: Prospective Audit with Feedback

Workflow Example



Action

Example: Focused Initiatives

Pathogen specific

- *C. difficile*
- MRSA
- ESBLs

Infection-based

- Pneumonia
- Surgical site infections
- Catheter-associated urinary tract infections (CAUTI)

Provider-based (e.g. antibiotic time outs)

Rapid diagnostics and other testing



CA-UTI DICON Prevention Initiative

Focused on instituting three simple and basic “system controls”:

- Hospital-wide protocol for patients who cannot void
- Hospital-wide protocol for assessing the continued need for a urinary catheter after one has been inserted
- Comprehensive review and revision of pre- and postoperative order sets to ensure that indications for urinary catheterization and routine orders for postoperative removal of catheters are clearly stated

Key goals:

- Reduce the risk and rate of CA-UTIs → **Decreased antibiotic use**
- Improve patient safety (prevent harm)
- Help change the culture in staff



MRSA Screening in Pneumonia

Background

- Respiratory cultures are often not obtainable to guide antibiotic streamlining and de-escalation in pneumonia.
- According to recent studies, MRSA pneumonia can be accurately and safely ruled out if the MRSA nasal screen is negative (>90% NPV).
- A negative screen can support early discontinuation of anti-MRSA therapy.
- ATS/IDSA Community-acquired pneumonia guidelines now recommend use

Opportunities for collaboration

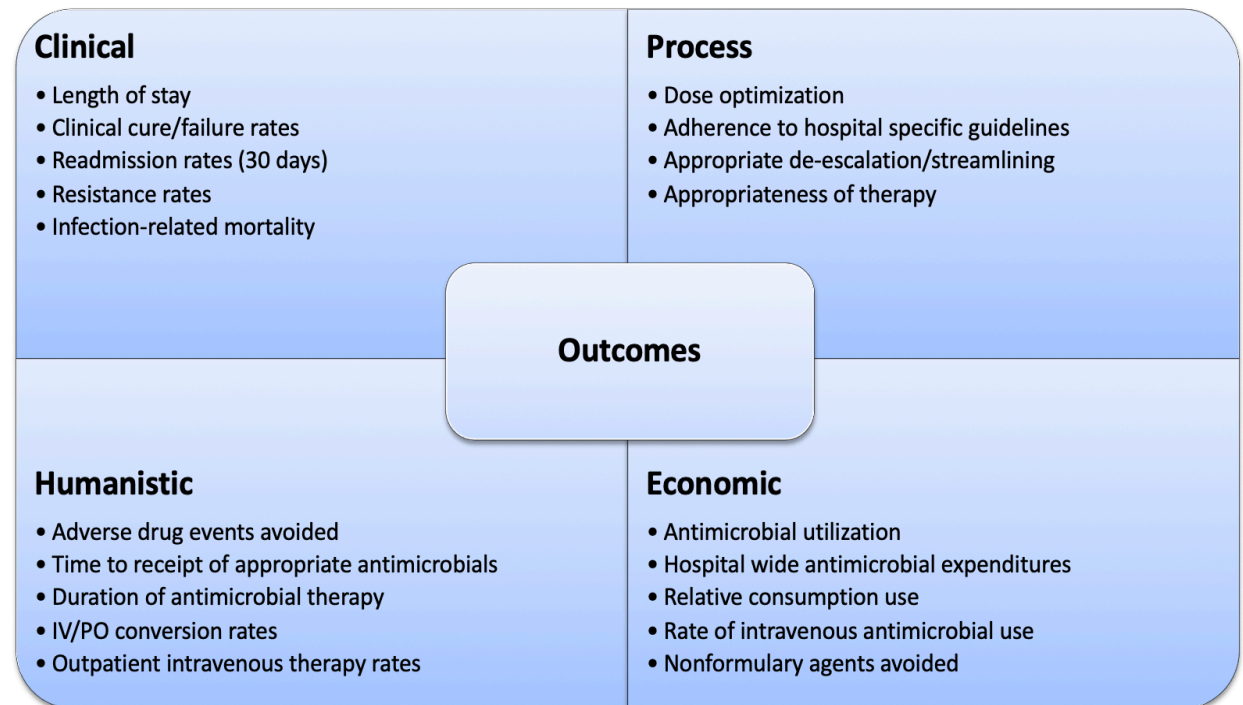
- Isolation procedure
- Education of nursing staff on proper specimen collection
- Education of providers regarding risk and impact on patient therapy



Tracking

Antimicrobial stewardship outcomes

- *C. difficile* infection and other HAI rates
- Antibiotic utilization rates
- Resistance patterns



CDC National Healthcare Safety Network (NHSN) Antimicrobial Use and Resistance(AUR) module

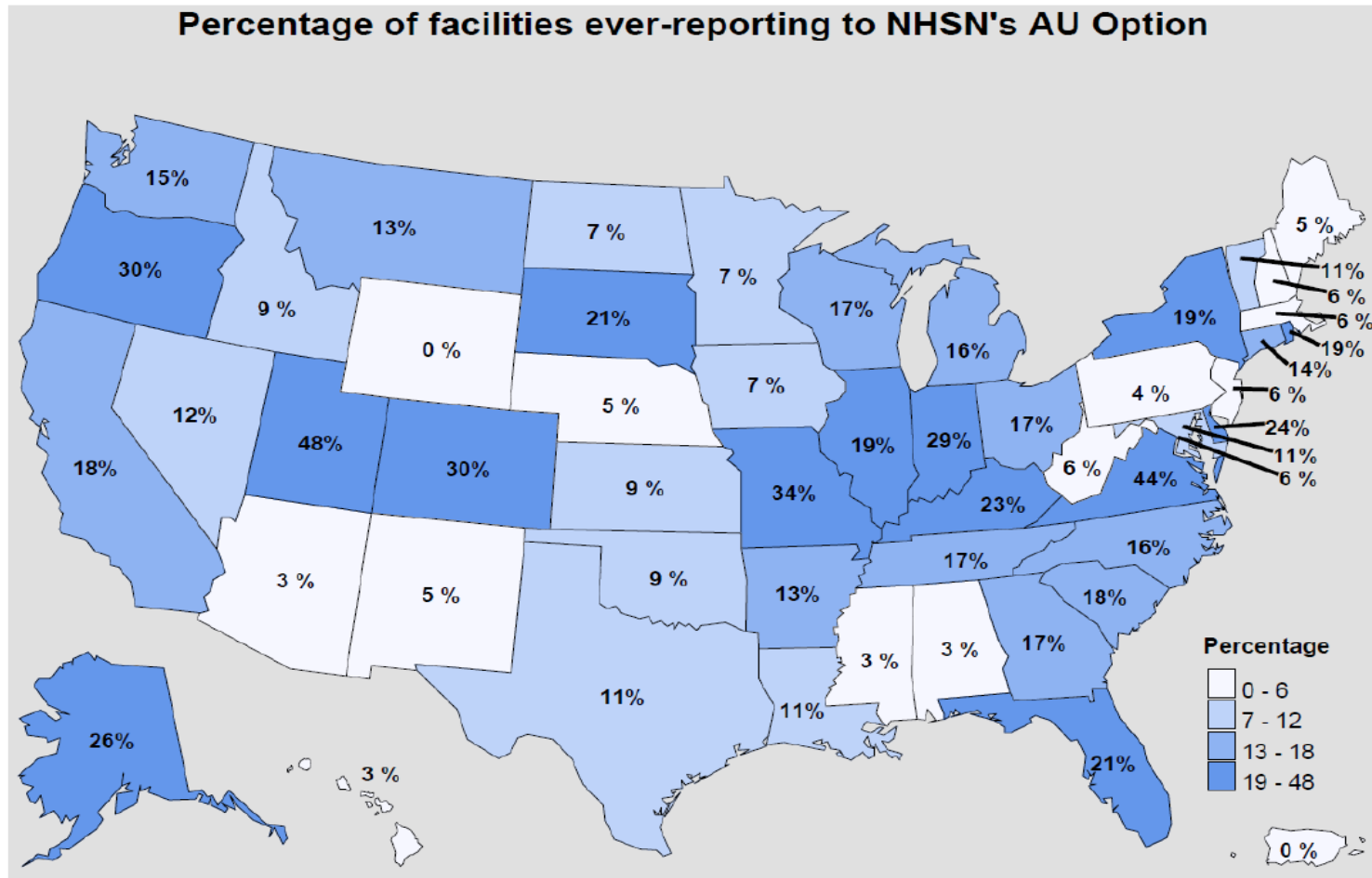
Provides a mechanism for facilities to report and analyze antimicrobial agent use as part of AS efforts at their facility.

Requires collaboration with IP to ensure that appropriate data structures are developed and kept in alignment for reporting.

Can also benefit IP team because antibiotic use patterns are often a key element in outbreak investigations.



Acute Care Hospital Participation in AU Option

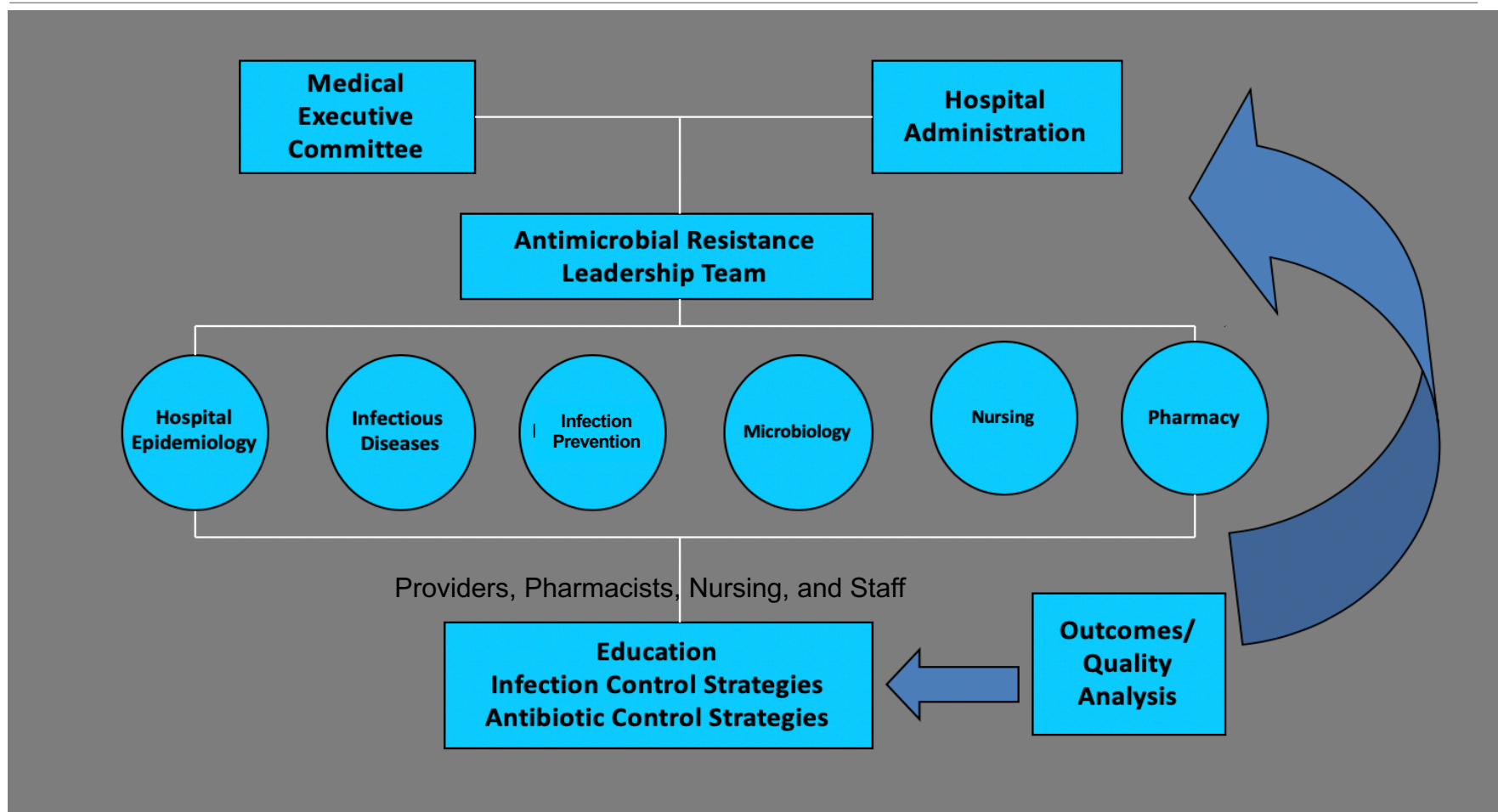


*Participation as of December 1, 2018



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Reporting



Education

A key component of antimicrobial stewardship

Examples: didactic presentations, posters, flyers and newsletters, or electronic communication to staff groups

Infection preventionists are experts who are already fighting against behavioral and institutional barriers that result in health care-associated infections

Encourage IP participation in designing and delivering AS-related education to health care providers



Summary

AS is now a requirement in acute care hospitals

AS and IP are synergistic and mutually benefit from a collaborative effort

The Infection Preventionists role in AS remains undefined – Be creative!

Focus on the core elements of AS as a guide for collaborative design

Always remember... Collaboration is key!



QUESTIONS?

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