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MEDICAL CENTER

# Nurse-driven Antibiotic Stewardship: Multisite Qualitative Study of Perceived Barriers to Recommended Practices

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Funder  
APIC Heroes Implementation Research Scholar Award Program 2017-2018

# Outline

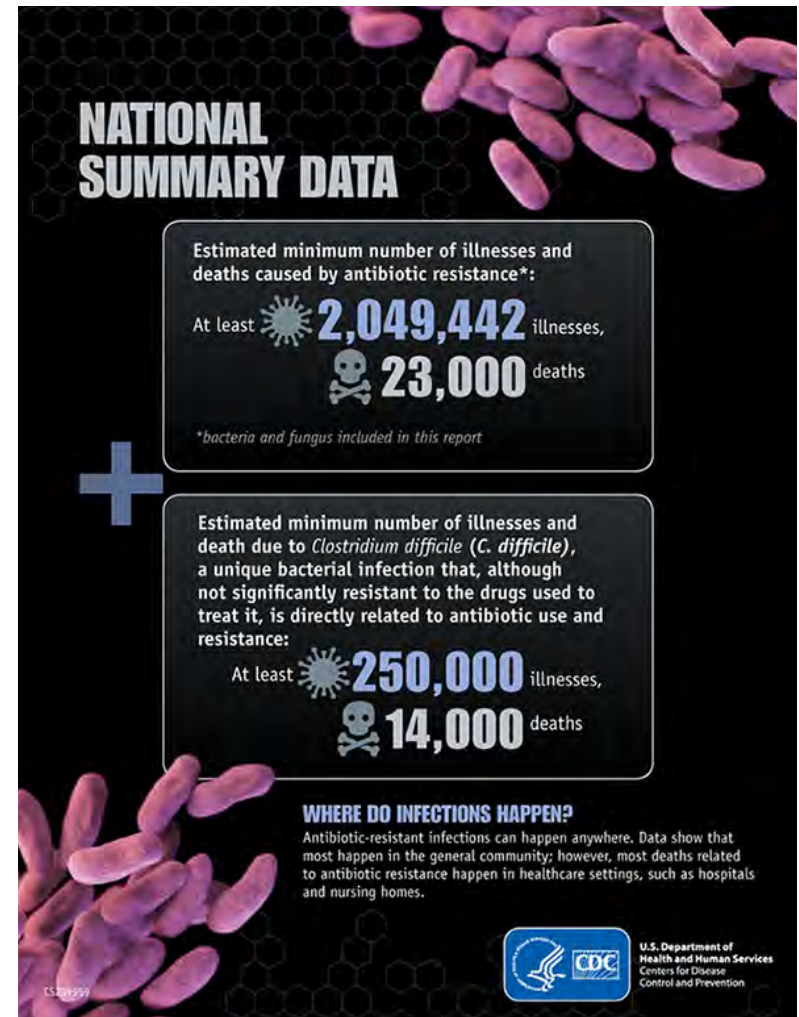
Overview of antimicrobial resistance and antimicrobial stewardship programs (ASPs)

Describe nurses' involvement in ASPs

Results from a multisite qualitative that aimed to explore barriers and facilitators to nurse-driven antibiotic stewardship

# Antimicrobial Resistance

- Organisms develop resistance to the antibiotics designed to kill them
- Unnecessary antibiotic use = major cause of antibiotic resistance
  - Approximately 55% of antibiotics are unnecessary or inappropriate (CDC)
- Global and national public health priority
  - 71st United Nations General Assembly
  - Centers for Medicare and Medicaid Services
  - Joint Commission



# WHO: What is antimicrobial resistance (AMR)?



Dr Marie-Paule Kieny  
World Health Organization Assistant Director-General  
for Health Systems and Innovation



Dr Keiji Fukuda  
Special Representative of the World Health Organization  
for Antimicrobial Resistance

[https://www.youtube.com/watch?v=LH0lPmSJn\\_8&list=PL9S6xGsoqIBXp4hGamlB-CnpxzyWmW-mr](https://www.youtube.com/watch?v=LH0lPmSJn_8&list=PL9S6xGsoqIBXp4hGamlB-CnpxzyWmW-mr)

# Global and National Public Health Priority

- International & National Focus on Antimicrobial Resistance
  - 71st United Nations General Assembly
  - Centers for Medicare and Medicaid Services
  - Joint Commission



# Antimicrobial Stewardship Programs (ASPs)

- ASPs - coordinated evidence-based efforts that promote appropriate antibiotic use
- Proven effectiveness
  - Reduce unnecessary antibiotic use
  - Decrease the incidence of antibiotic resistant bacteria and *Clostridium difficile*
- Membership and scope
  - Physicians and pharmacists with infectious disease training
  - Largely oversee and authorize the prescribing of antibiotics



# Outline

Overview of antibiotic resistance and antibiotic stewardship programs (ASPs)

Describe nurses' involvement in ASPs

Results from a multisite qualitative that aimed to explore barriers and facilitators to nurse-driven antibiotic stewardship





# Nursing Partnership: Largely Absent in Current ASP Efforts





**Table 1. Overlap of Nursing Activities With Function Attribution in Current Antimicrobial Stewardship Models**

	Nursing	Microbiology	Case Management	Pharmacy	Infectious Diseases	Infection Control	Inpatient Physician	Administration
<b>Patient admission</b>								
Triage and appropriate isolation	•					•		
Accurate allergy history	•			•	•		•	
Early and appropriate cultures	•				•		•	
Timely antibiotic initiation	•				•		•	•
Medication reconciliation	•			•			•	
<b>Daily(24 h) clinical progress monitoring</b>								
Progress monitor and report	•		•		•		•	
Preliminary micro results and antibiotic adjustment	•	•		•	•		•	
Antibiotic dosing and de-escalation	•			•	•		•	
<b>Patient safety &amp; quality monitoring</b>								
Adverse events	•			•	•		•	
Change in patient condition	•				•		•	
Final culture report and antibiotic adjustment	•	•		•	•	•	•	
Antibiotic resistance identification	•	•			•	•	•	
<b>Clinical progress/patient education/discharge</b>								
IV to PO antibiotic, outpatient antibiotic therapy	•		•	•	•		•	
Patient education	•				•	•	•	
Length of stay	•		•		•		•	•
Outpatient management, long-term care, readmission	•		•		•	•		•

Abbreviations: IV, intravenous; PO, per os [oral].

# How do ASP guiding documents specify nurses' involvement in ASPs?

# Joint Commission ASP Standard

## **APPROVED: New Antimicrobial Stewardship Standard**

The Joint Commission recently announced a new Medication Management (MM) standard for **hospitals, critical access hospitals, and nursing care centers**. Standard MM.09.01.01 addresses antimicrobial stewardship and becomes **effective January 1, 2017**.

Current scientific literature emphasizes the need to reduce the use of inappropriate antimicrobials in all health care settings due to antimicrobial resistance. According to the World Health Organization (WHO): "Antimicrobial resistance threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi."<sup>1</sup> The Centers for Disease Control and Prevention (CDC) identified that 20%–50% of all antibiotics prescribed in US acute care hospitals are either unnecessary or inappropriate.<sup>2</sup> The CDC has also stated: "Antibiotics are among the most commonly prescribed medications in **nursing homes**. Up to 70% of long-term care facilities' residents receive an antibiotic every year."<sup>3</sup>

On June 2, 2015, The Joint Commission participated in the White House Forum on Antibiotic Stewardship. The Joint Commission joined representatives from more than 150 major health care organizations, food companies, retailers, and animal health organizations at the forum to express commitment for implementing changes over the next five years to slow the emergence of antibiotic-resistant bacteria, detect resistant strains, preserve the efficacy of existing antibiotics, and prevent the spread of resistant infections.<sup>4</sup>

Subsequently, The Joint Commission developed the antimicrobial stewardship standard for hospitals, critical access hospitals, nursing care centers, ambulatory care organizations, and office-based surgery practices and conducted a field review in November and December 2015. Prior to and during the field review, Joint Commission staff conducted stakeholder calls on the proposed antimicrobial stewardship standard with several governmental and professional organizations, including the Centers for Medicare

*Continued on page 3*

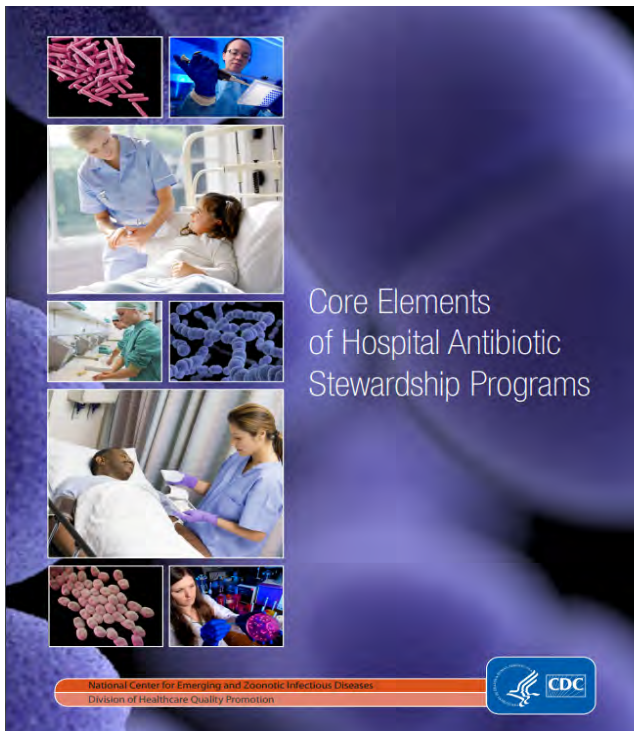
Page 1

Joint Commission Perspectives®, July 2016, Volume 36, Issue 7  
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**Reporting: Regularly reporting information on the antimicrobial stewardship program, which may include information on antibiotic use and resistance, to doctors, nurses, and relevant staff.**


The Joint Commission. (2016). Approved: New Antimicrobial Stewardship Standard. Retrieved from [https://www.jointcommission.org/assets/1/6/New\\_Antimicrobial\\_Stewardship\\_Standard.pdf](https://www.jointcommission.org/assets/1/6/New_Antimicrobial_Stewardship_Standard.pdf) 11

# CDC – Core Elements of ASPs



Core Elements of Hospital Antibiotic Stewardship Programs

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



KEY SUPPORT FOR THE ANTIBIOTIC STEWARDSHIP PROGRAM	
Does any of the staff below work with the stewardship leaders to improve antibiotic use?	
B. Clinicians	<input type="checkbox"/> Yes <input type="checkbox"/> No
C. Infection Prevention and Healthcare Epidemiology	<input type="checkbox"/> Yes <input type="checkbox"/> No
D. Quality Improvement	<input type="checkbox"/> Yes <input type="checkbox"/> No
E. Microbiology (Laboratory)	<input type="checkbox"/> Yes <input type="checkbox"/> No
F. Information Technology (IT)	<input type="checkbox"/> Yes <input type="checkbox"/> No
G. Nursing	<input type="checkbox"/> Yes <input type="checkbox"/> No

Nurses can assure that cultures are performed before starting antibiotics. In addition, nurses review medications as part of their routine duties and can prompt discussions of antibiotic treatment, indication, and duration.<sup>46, 47</sup>



# IDSA Guidelines & Nursing Involvement in ASPs

- **Evidence Summary**

Education is a common tool for ASPs. Strategies include educational meetings with didactic lectures and distribution of educational pamphlets and materials. No comparative studies are available to determine which educational strategy is most effective. Educational strategies should include medical, pharmacy, physician assistant, nurse practitioner, and nursing students and trainees. In a survey of fourth-year medical students at 3

*Clinical Infectious Diseases*

**IDSA GUIDELINE**

**IDSA** **hivma** **OXFORD**  
Infectious Diseases Society of America hiv medicine association

## 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>

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Barlam, T. F., Cosgrove, S. E., Abbo, L. M., MacDougall, C., Schuetz, A. N., Septimus, E. J., . . . Trivedi, K. K. (2016). Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. *Clinical Infectious Diseases*, 62(10), e51-e77. doi:10.1093/cid/ciw118

# ASP Guiding Documents Fail to Account for Nurses' Overarching Antibiotic-Related Responsibilities

**Table 1. Overlap of Nursing Activities With Function Attribution in Current Antimicrobial Stewardship Models**

	Nursing	Microbiology	Case Management	Pharmacy	Infectious Diseases	Infection Control	Inpatient Physician	Administration
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Timely antibiotic initiation	•				•		•	•
Medication reconciliation	•			•			•	
<b>Daily(24 h) clinical progress monitoring</b>								
Progress monitor and report	•		•		•		•	
Preliminary micro and antibiotic adj	•			•	•		•	
Antibiotic dos escalation	•			•	•		•	
<b>Patient safety &amp; quality</b>								
Adverse events				•	•		•	
Change in patient cond					•		•	
Final culture report adjustment				•	•	•	•	
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<b>Clinical progress/patient education/discharge</b>								
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Patient education	•				•	•	•	
Length of stay	•		•		•		•	•
Outpatient management, long-term care, readmission	•		•		•	•		•

Abbreviations: IV, intravenous; PO, per os [oral].



# Nurse-Driven Antibiotic Stewardship

Contents lists available at ScienceDirect

**American Journal of Infection Control**

journal homepage: [www.ajicjournal.org](http://www.ajicjournal.org)

**ELSEVIER**

**AJIC**  
American Journal of Infection Control

Practice Forum

**Combating antibiotic resistance: The role of nursing in antibiotic stewardship**

Mary Lou Manning PhD, CRNP, CIC <sup>1\*</sup>, Jeanne Pfeiffer DNP, MPH, RN, CIC <sup>2</sup>, Elaine L. Larson PhD, RN, CIC <sup>3</sup>

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**SPECIAL FEATURE**

**Good Nursing Is Good Antibiotic Stewardship**

Successful stewardship depends on nurses' ongoing vigilance.

**ABSTRACT**  
Resistance to antibiotics has increased dramatically in the United States, with serious associated medical, social, and economic consequences. The most promising approach to this national crisis is a new understanding of the need for the careful and responsible use of antibiotics, both for the benefit of society and for the optimal care of each patient. This multidisciplinary approach, called antimicrobial stewardship, has typically involved specialists but not necessarily nurses, who perform numerous antibiotic-related activities daily and should be an integral part of antimicrobial stewardship programs. In this article, we use patient examples to review several stewardship activities and illustrate how nurses are essential to the appropriate use of antibiotics.

**Keywords:** antibiotic resistance, antimicrobial stewardship, infectious disease, nursing stewardship

*J Infect Prev.* 2011 January ; 12(1): 6–10. doi:10.1177/1757177410389627.

**Covering more Territory to Fight Resistance: Considering Nurses' Role in Antimicrobial Stewardship**

R Edwards<sup>(1),\*</sup>, LN Drumright<sup>(1)</sup>, M Kiernan<sup>(2),(3)</sup>, and A Holmes<sup>(1),(4)</sup>

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<sup>2</sup> Infection Prevention Society, UK  
<sup>3</sup> Southport and Ormskirk Hospital NHS Trust, UK  
<sup>4</sup> Imperial College Healthcare NHS Trust, London, UK

Contents lists available at ScienceDirect

**Nurse Education Today**

journal homepage: [www.elsevier.com/locate/nesd](http://www.elsevier.com/locate/nesd)

**ELSEVIER**

**Nurse Education Today**

Contemporary Issues

**Antibiotic stewardship: The role of clinical nurses and nurse educators**

*Clinical Infectious Diseases*

**INVITED ARTICLE**

CLINICAL PRACTICE: Ellie J. C. Goldstein, Section Editor

**The Critical Role of the Staff Nurse in Antimicrobial Stewardship—Unrecognized, but Already There**

Richard N. Olans,<sup>1</sup> Rita D. Olans,<sup>2</sup> and Alfred DeMaria Jr<sup>3</sup>

<sup>1</sup>Hallmark Health System, Inc., Melrose-Wakefield Hospital, <sup>2</sup>MGH Institute of Health Professions - School of Nursing, Boston, and <sup>3</sup>Bureau of Infectious Disease, Massachusetts Department of Health, William A. Hinton State Laboratory Institute, Jamaica Plain, Massachusetts

**IDS**  
Infectious Diseases Society of America

**hivma**  
hiv medicine association

**OXFORD**

**Spotlight on Leadership**

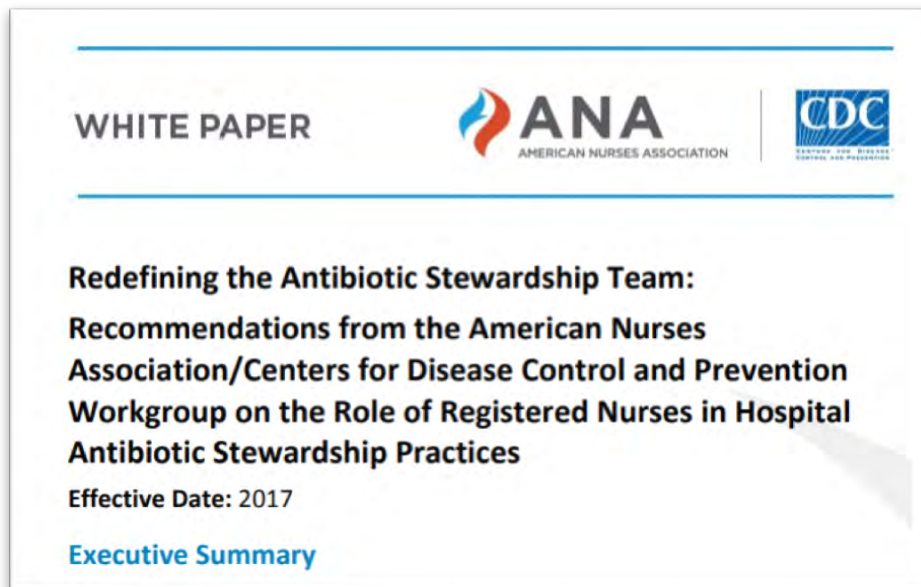
**Keeping Patients Safe**

*Antibiotic Resistance and the Role of Nurse Executives in Antibiotic Stewardship*

Mary Lou Manning, PhD, CRNP, CIC, FAAN  
Donna Giannuzzi, MBA, RN, NEA-BC



# National Recognition of Nurses' Widespread Antibiotic-Related Responsibilities



## Suggestions from the Workgroup

The workgroup identified four key questions and developed suggestions to address each of them.

### What are the roles that bedside nurses can and should play in working to improve antibiotic use?

- Obtain appropriate cultures, using proper technique, before antibiotics are started. Understand how the microbiology laboratory processes those samples.
- Use microbiology results to help guide the optimal selection of antibiotics and guide decisions to stop therapy in cases where culture results represent colonization, rather than infection.
- Help inform decisions to start antibiotics promptly at the time early signs of likely bacterial infections, including sepsis, are identified.
- Help ensure that practices to ensure good antibiotic use are embedded in other quality improvement efforts. For example, for sepsis, help ensure that antibiotics are started promptly and then reviewed once additional data, especially cultures, are available.
- Prompt, and participate in, discussions about antimicrobial usage including antibiotic de-escalation by evaluating each patient's clinical status and readiness for change from intravenous to oral therapy, when possible.
- Take a more detailed allergy history, especially around penicillin allergy. Help educate patients and families about what constitutes an accurate antibiotic allergy history.

# Outline

Overview of antibiotic resistance and antibiotic stewardship programs (ASPs)

Describe nurses' involvement in ASPs

Results from a multisite qualitative that aimed to explore barriers and facilitators to nurse-driven antibiotic stewardship



# Publication

ARTICLE IN PRESS

American Journal of Infection Control ■■ (2017) ■■-■■

Contents lists available at ScienceDirect

 American Journal of Infection Control 

journal homepage: [www.ajicjournal.org](http://www.ajicjournal.org)

Major Article

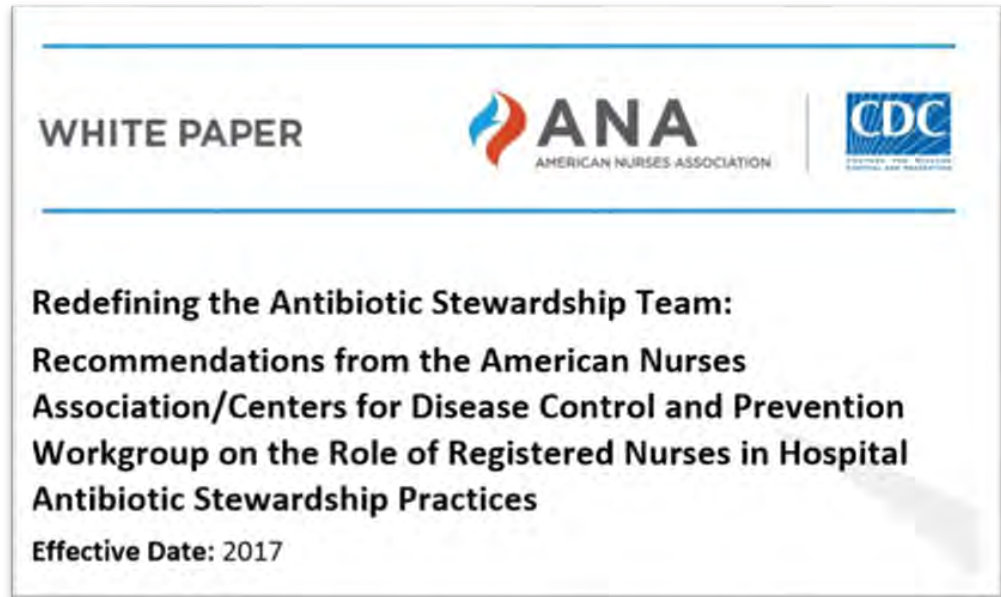
**Exploring the nurses' role in antibiotic stewardship: A multisite qualitative study of nurses and infection preventionists**

Eileen J. Carter PhD, RN<sup>a,b,\*</sup>, William G. Greendyke MD<sup>c,d</sup>, E. Yoko Furuya MD, MS<sup>c,d</sup>, Arjun Srinivasan MD, FSHEA<sup>e</sup>, Alexa N. Shelley MS, FNP-BC<sup>a,b</sup>, Aditi Bothra BS, CHES<sup>f</sup>, Lisa Saiman MD, MPH<sup>c,g</sup>, Elaine L. Larson PhD, RN, FAAN, CIC<sup>a,f</sup>

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**Funding: This research was funded by the APIC Heroes Implementation Research Scholar Award Program 2017-18, which was supported by an educational grant from BD (PI: Carter)**

# Study Aims



1) Explore nurses' current antibiotic-related roles and responsibilities; and 2) gain input on recommendations that have been proposed that advance and formalize nursing-driven antibiotic stewardship.

▪ **Funding:** This research was funded by the APIC Heroes Implementation Research Scholar Award Program 2017-18, which was supported by an educational grant from BD (PI: Carter).

# Nurse-Driven Antibiotic Stewardship Practice Recommendations

- 」 ■  
**#1** • Documenting drug allergy information accurately
  
- 」 ■  
**#2** • Encouraging the safe conversion of intravenous (IV) to oral (PO) antibiotics.
  
- 」 ■  
**#3** • Initiating an antibiotic “time-out” with prescribers.



# Methods

## Qualitative study

- Two urban academic hospitals
  - Pediatric
  - Adult

## Data collection

- Focus groups & interviews
- March – June 2017
- Clinical nurses, nurse managers, infection preventionists
  - Intensive care units & medical surgical units

## Data analysis

- Conventional content analysis

# Study Participants

Participant Role & Unit	Hospital		Total
	<u>Adult</u>	<u>Pediatric</u>	
<b>Clinical Nurse</b>			
<u>ICU</u>	<b>16</b>	<b>10</b>	<b>26</b>
<u>Medical/Surgical</u>	<b>14</b>	<b>9</b>	<b>23</b>
<b>Nurse Manager</b>			
<u>ICU</u>	<b>0</b>	<b>1</b>	<b>1</b>
<u>Medical/Surgical</u>	<b>2</b>	<b>2</b>	<b>4</b>
<b>Infection Preventionist</b>	<b>5</b>	<b>2</b>	<b>7</b>
<b>Total</b>	<b>37</b>	<b>24</b>	<b>61</b>



# Findings: Nursing Antibiotic-Related Responsibilities

## Current Responsibilities

- Administering antibiotics timely
- Knowing the indication for antibiotic
- Educating patients on the indication for antibiotics and side effects

# Recommendation #1 Findings: Nurses May Document Drug Allergy Information Accurately

## Challenges

- Perception that the information reported by patients is intended for nurses to document in the medical record
- Focus on documentation rather than interpretation



# Recommendation #1 Findings: Nurses May Document Drug Allergy Information Accurately

## Strategy to Overcome Identified Challenges

4

*“[Nurses] should definitely initiate a conversation and ascertain more information. I think it’s then up to the physician, and you know, or—and, or the pharmacist to—to see if it’s a really true allergy, or do they want to desensitize the patient.”*



# Recommendation #2 Findings: Nurses May Encourage the IV to PO Switch

## Challenges

- Knowledge needs
- Prescriber pushback
- Patient-level considerations

# Recommendation #2 Findings: Nurses May Encourage the IV to PO Switch

## Strategy to Overcome Identified Challenges

“Education would be needed for providers and for nursing, on what...those antibiotics would be...this is the same PO, so we could use that.”



# Recommendation #3 Findings: Nurses May Initiate an Antibiotic Time-Out

## Challenges

- Duplicative work
- Prescriber pushback
- Knowledge gaps
- Workflow considerations

# Recommendation #3 Findings: Nurses May Initiate an Antibiotic Time-Out

## Strategy to Overcome Identified Challenges

“Specify and provide guidance on the specific elements of antibiotic management that nurses should review...we need... an algorithm, and we need to educate ourselves, [because] otherwise we’re not going to feel ...empowered.”





# Discussion

- Knowledge needs
  - Nurses reported knowledge needs
    - Antibiotic management, in general, and nurses' roles and responsibilities related to antibiotics
    - Tailoring the 5 rights of medication administration to antibiotics
  - Previous work identified additional opportunities for improvement
    - 171 (37%) familiar with phrase antimicrobial stewardship
    - 255 (55%) able to identify a drug intolerance

5 Rights of Drug Administration



Right Patient



Right Drug



Right Dose



Right Route



Right Time

# Nursing Education Fails to Prepare Nurses to Become Stewards of Antibiotic Use

## Pre-Licensure

*“...Infection control issues, such as drug resistant organisms and management.”*

American Association of Colleges of Nursing. (2008). The Essentials of Baccalaureate Education for Professional Nursing Practice. In American Association of Colleges of Nursing (Ed.). Washington, DC.

## Post-Licensure

State	Requires CE to renew RN license	Number of CE hours to renew RN license	Number of CE hours required for re-entry	CE hours required for HIV/AIDS
Alabama	Yes	24 contact hours for active license	24 hours/2 years <sup>1</sup>	No
Alaska	Yes	30 hours	30 hours	No
Arizona	No	None	60 hrs / 5 yrs re-entry course	No
Arkansas	Yes	15 hrs every 2 yr renewal	20 hours within the past two yrs plus refresher course	No
California	Yes	30 hours within 2 years	30 hrs within past 2 years; after 8 yrs of lapsed status, NCLEX is required	Yes <sup>2</sup>
Colorado	No	None	No	No
Connecticut	No	None	Board discretion for lapsed license	No
Delaware	Yes	30 contact hours biennially	30 hrs for RNs / 15 hrs for APRNs if less than 2yrs, greater than 1 yr	No
District of Columbia	Yes	24 contact hrs in an area relevant to the area of practice within the past 2 yrs	12 hours / year	No
Florida	Yes	24 contact hours within 2 years <sup>3</sup>	1 hour per month if inactive	2 hours HIV/AIDS once, 1 hr of which must be completed prior to first renewal
Georgia	No	None	No	No

American Nurses Association. (2013). *States Which Require Continuing Education for RN Licensure*. Retrieved from

<http://www.nursingworld.org/MainMenuCategories/Policy-Advocacy/State/Legislative-Agenda-Reports/NursingEducation/CE-Licensure-Chart.pdf>

# Strengths

- Recommended qualitative methods employed to ensure the trustworthiness of data
  - Verbatim transcriptions
  - Triangulation of data sources, investigators
  - Ongoing assessments of the application of codes

# Limitation

- Transferability of study findings
  - Study conducted in two hospitals that were part of the same healthcare system in New York

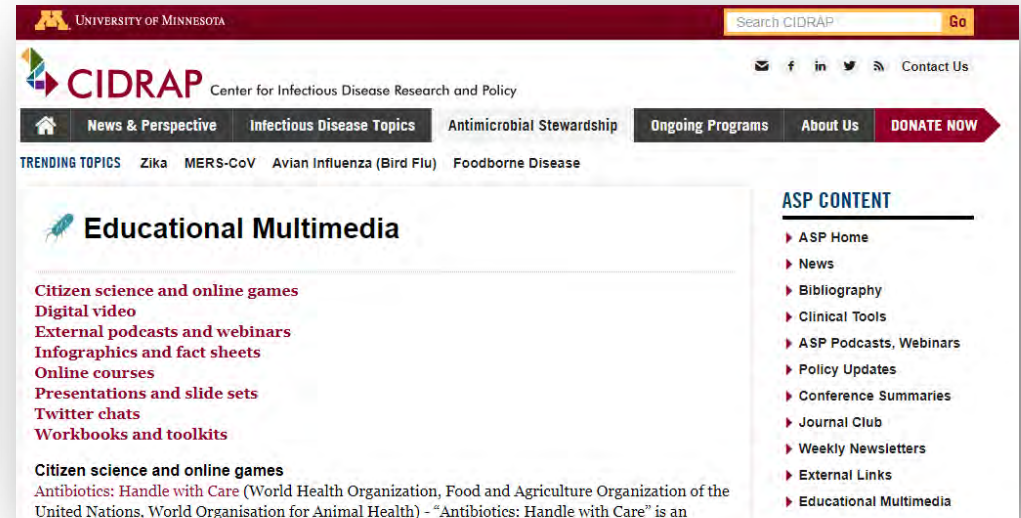


# Conclusions

- Nurses expressed enthusiasm to partner in antibiotic stewardship efforts
- Challenges to nurse-driven antibiotic stewardship
  - Lack of consistently defined nurse-driven antibiotic stewardship responsibilities (CDC core elements vs. CDC/ANA white paper vs. Joint Commission)
  - Knowledge needs
  - Prescriber pushback
  - Workflow considerations



# Valuable Educational Resources





# Acknowledgements

David P. Calfee, MD, MS

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William Greendyke, MD

Members of the ANA/CDC Working  
Group Conference

Sharon Morgan, MSN, RN, NP-C

Arjun Srinivasan, MD



**APIC**<sup>®</sup>

Association for Professionals in  
Infection Control and Epidemiology

**Thank you to the those  
who participated in this  
study!**



Nurses Role in Antibiotic Stewardship  
ANA/CDC Working Group Conference  
July 28, 2016



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# Questions?

# Thank you!



*(FREE European Teleclass ... Denver Russell Memorial Teleclass Lecture)*

**HOPES, HYPES, AND MULTIVALLATE DEFENCES AGAINST ANTIMICROBIAL RESISTANCE**

April 10, 2018

Speaker: **Prof. Neil Woodford**, Imperial College London and Public Health England

*Broadcast annually in memory of our very good friend and tireless Teleclass Education supporter, Prof. A. Denver Russell.*

April 12, 2018

**UNDERSTANDING RISK PERCEPTIONS AND RESPONSES OF THE PUBLIC, HEALTHCARE PROFESSIONALS, AND THE MEDIA: THE CASE FOR CLOSTRIDIUM DIFFICILE**

Speaker: **Dr. Emma Burnett**, University of Dundee, Scotland

April 18, 2018

*(South Pacific Teleclass)*

**GENETIC SIMILARITIES BETWEEN ORGANISMS ISOLATED FROM THE ICU**

Speaker: **Prof. Slade Jenson**, Western Sydney University, Australia

April 19, 2018

**TOPICAL ANTIBIOTICS TO PREVENT POST-OPERATIVE SURGICAL INFECTION ... IS THE PARADIGM CHANGING?**

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Speaker: **Prof. Didier Pittet**, University of Geneva Hospitals



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