Combating Antibiotic Resistance: The Future Role of the Infection Preventionist in Antibiotic Stewardship

Infection Preventionists Leading the Way to Reduce Healthcare-Associated Infections Columbia, MO
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Mary Lou Manning, PhD, CRNP, CIC, FAAN
Professor
Thomas Jefferson University
Jefferson College of Nursing
Philadelphia, PA
No Disclosures

Objectives
- Discuss how antibiotic stewardship (AS) is unfolding and spreading beyond infectious diseases physicians and clinical pharmacists
- Identify how other disciplines, particularly infection preventionists (IP) can support AS programs
- Discuss developing expertise as the IP role continues to evolve
- Review potential barriers for IP integration in AS programs or how to obtain resources from administrative leaders

Pretest Question 1
True or False: The Infectious Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America (SHEA) define antibiotic stewardship (AS) as the coordinated interventions designed to improve and measure the appropriate use of antibiotics by promoting the selection of the optimal antibiotic drug regimen including dosing, duration of therapy, and route of administration. Based on this definition AS is limited to antibiotic prescribers (e.g., physicians) and dispensers (pharmacists).

Pretest Question 2
True or False: IDSA and SHEA strongly believe, and CDC concurs that AS programs are best led by ID physicians with additional stewardship training or clinical pharmacist with additional infectious disease training.

Pretest Question 3
What percentage of US hospitals reported AS programs with all 7 of CDC’s Core Elements?
- a) 10%
- b) 20%
- c) 40%
- d) 80%

Pretest Question 4
True or False: AS is just one of many measures needed to prevent and manage antibiotic resistance in the hospital. A well functioning infection prevention and control program is fundamental to successful organizational stewardship strategies.
Antibiotic Resistance

The rapid emergence of resistant bacteria is occurring worldwide, endangering the efficacy of antibiotics, which have transformed medicine and saved millions of lives. Many decades after the first patients were treated with antibiotics, bacterial infections have again become a threat. The antibiotic resistance crisis has been attributed to the overuse and misuse of these medications, as well as a lack of new drug development by the pharmaceutical industry due to reduced economic incentives and challenging regulatory requirements.

Antibiotic Resistance in the US

- Each year over 2 million Americans develop serious infections with bacteria that are resistant to one or more antibiotics, and at least 23,000 people die each year as a direct result of these infections.
- In U.S. hospitals up to half of patients receive at least one antibiotic and as much as 50% of that use is unnecessary or inappropriate.
- In outpatient health care settings, approximately half of antibiotic prescribing is inappropriate and at least 30% unnecessary.
- In long term care facilities approximately 80% of residents receive at least one antibiotic course annually and more than 75% prescribed are inappropriate.

Not a New Concept

It is not difficult to make microbes resistant to penicillin in the laboratory by exposing them to concentrations not sufficient to kill them, and the same thing has occasionally happened in the body. The time may come when penicillin can be bought by anyone in the shops. Then there is the danger that the ignorant man may easily underdose himself and by exposing his microbes to non-lethal quantities of the drug make them RESISTANT. Dr. Alexander Fleming, 1945
**National Strategy**

**September 18, 2014**

The White House announced a new federal effort to combat antibiotic resistant bacteria.

Three parts:
- Report from the President’s Council of Advisors on Science and Technology (PCAST)
- National Strategy to Combat Antibiotic-Resistant Bacteria (CARB)
- Executive Order 13676: Combating Antibiotic-Resistant Bacteria

Stewardship prominent in all three parts.

**National Action Plan**

**March 2015**

- Outlines steps for implementing the National Strategy-5 year roadmap
- Primary goal: guide activities by the federal government as well as actions by public health, healthcare, and veterinary partners to address this urgent drug-resistant threat
- Calls for establishment of AS programs in all acute care hospitals by 2020

**June 2015**

**White House Forum on Antibiotic Stewardship**

As part of the continued effort to combat antibiotic resistance the White House convened the Forum to bring together key human and animal health constituencies to collaboratively take action to address the development, promotion, and implementation of strategies to ensure the responsible use of antibiotics.

More than 150 food companies, retailers, and human and animal health stakeholders committed to implement changes over the next five years to help reduce the threat of resistant bacteria and prevent the spread of resistant infections.

**September 2015**

Presidential Advisory Council on Antibiotic-Resistant Bacteria (PACCARB) established.

The Advisory Council provides advice, information, and recommendations to the US Department of Health and Human Service’s Secretary regarding programs and policies intended to support and evaluate the implementation of Executive Order 13676 including the National Strategy for Combating Antibiotic-Resistant Bacteria (Strategy) and the National Action Plan for Combating Antibiotic-Resistant Bacteria (Action Plan).
June 2016
- The Joint Commission announced a new Medication Management (MM) standard for hospitals, critical access hospitals, and nursing care centers.
- The Centers for Medicare & Medicaid Services (CMS) released a proposed rule to help address the growing threat of antibiotic resistance. It outlines the updated standards, known as “conditions of participation,” that hospitals must meet in order to participate in U.S. Medicare and Medicaid programs.

January 1, 2017
- The Joint Commission new Standard MA.09.01.01 related to antimicrobial stewardship becomes effective.

Antibiotic stewardship programs are not new - documented in US hospitals since 1970s

Antimicrobial stewardship (AS) is defined by the Infectious Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America (SHEA) as coordinated interventions designed to improve and measure the appropriate use of antibiotics by promoting the selection of the optimal antibiotic drug regimen including dosing, duration of therapy, and route of administration.

This 2007 document formalized antibiotic stewardship as a programmatic activity

Stewardship Goals
- From a public health standpoint, reduction of emergence of antibiotic resistance and preservation of existing and future antimicrobial agents are a priority.
- Optimizing antibiotic selection, dose, route of administration, and duration of therapy to maximize clinical cure while limiting unintended consequences, such as the emergence of resistance at the patient level, Clostridium difficile infection, and adverse drug toxicities
- Prevent antibiotic overuse, misuse, and abuse
Dedicating necessary human, financial and information technology resources.

Appointing a single leader responsible for program outcomes. Experience with successful programs show that a physician leader is effective.

Appointing a single pharmacist leader responsible for working to improve antibiotic use.

Implementing at least one recommended action, such as systemic evaluation of ongoing treatment need after a set period of initial treatment (i.e. “antibiotic time out” after 48 hours).

Monitoring antibiotic prescribing and resistance patterns.

Educating clinicians about resistance and optimal prescribing.

2016

Based on CDC Core Elements for Hospital ASP Programs.

Has specific suggestions for implementation and a special section on measurement.

Identifies potential barriers and solutions.

Tools and resources: Making the Business Case for ASP.
Successful hospital AS programs, like infection prevention and control programs, are complex, resource-intensive, and require constructive engagement with a broad spectrum of hospital personnel.

There are not enough specialty-trained ID physicians or pharmacist with additional infectious disease training to meet the demand.

To date AS programs have been physician-centric. That is changing. AS is now on the minds and agendas of health professions and clinical specialties, other than ID physicians and clinical pharmacists.

In the acute care setting IPs may (or may not) have limited formal power, but often have significant informal power and influence due to their access to key organizational leaders and clinical decision makers.
Future IP Role/Responsibilities

• Antibiotic stewardship is much, much more than improving prescribing practices. Similar to HAI prevention - it is about improving systems of care.
• IPs understand the organizational factors that affect the implementation of infection prevention and control strategies. IPs understand systems of care.
• IPs prevent HAI by working with and through others involved in daily patient care.
• How might IPs influence and engage in AS activities?

IPs Understand Process: Antibiotic Safety

Penicillin Allergy
Culture Practices
Antibiotic De-escalation

Penicillin allergy is the most common self-reported medication allergy, occurring in up to 20% of the general population. After formal allergy evaluation, 90%-99% of patients with reported allergy can tolerate penicillins. (Ann Allergy Asthma Immunol 115 (2015) 294-300.)

• Inaccurate self-reporting results in patients likely being treated with broad-spectrum antibiotics, such as quinolones, vancomycin, and third generation cephalosporins, thereby contributing to antibiotic resistance.

Emerging or future IP role?

Culture Practices

Ensure proper culturing technique
Interpret results
Colonization vs. infection
Emerging or future IP role?

Antibiotic De-escalation

Resume antibiotic therapy after 48 hours when culture results are available

Future IP Role/Responsibilities

• Unprecedented time for antibiotic stewardship
• Should IPs be part of the ASP core team or “support”?
• Should IPs lead the ASP team?
• Should ASPs come under the umbrella of IPC or patient safety? After all, virtually everyone understands and accepts the need for infection prevention and control services, including hospital accountants!
• Where do you want to be? Where should you be?
• What will it take to get there?
• How will the new JC Standard affect the IPC program?
What Next?

- Become an AS subject matter expert. At a minimum read the articles in this talk.
- Be proactive! Don’t wait for an invitation. An IP should be on the AS program steering committee.
- Expand your network.
- Be deliberate: know what you will contribute.
- Discuss IPC role with your health care epidemiologist.
- Conduct staff training: lunch and learn, roundtable discussions, seminars.
- The new frontier in molecular diagnostics: role of IP.

Reflection

- How can you have the greatest impact?
- What do you need to know?
- Who do you need to know?
- What will you do by Tuesday?

Question 1 - False

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Question 2 - True

IDSA and SHEA strongly believe, and CDC concurs that AS programs are best led by ID physicians with additional stewardship training or clinical pharmacist with additional infectious disease training.

Question 3 – 40%

What percentage of US hospitals reported AS programs with all 7 of CDC’s Core Elements?

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Question 4 - True

AS is just one of many measures needed to prevent and manage antibiotic resistance in the hospital. A well functioning infection prevention and control program is fundamental to successful organizational stewardship strategies.

mary.manning@jefferson.edu