Antimicrobial Stewardship
“The Physician-Pharmacist Synergy”

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EAST ALABAMA MEDICAL CENTER
No disclosures
Objectives

- Discuss the leadership role of infectious diseases (ID) physicians in antimicrobial stewardship.
- Review current literature on ID physicians' impact on antimicrobial stewardship.
- Identify the challenges between private practice ID physicians and antimicrobial stewardship.
- Describe the relationship between ID physicians and pharmacist and how they can improve antimicrobial usage.
Goals of ASPs

Our Patient’s Outcomes:
Current and future patient

• Optimize clinical outcomes:
  ❑ minimize unintended consequences of antimicrobial use
  ➢ Unintended consequences:
    1. Toxicity
    2. Selection of pathogenic organisms
    3. Emergence of resistant pathogens

• Secondary goal Reduce healthcare costs without adversely impacting quality of care
Origins and Evolution of Antibiotic Resistance, Julian Davies, Dorothy Davies
Microbiology and Molecular Biology Reviews Aug 2010, 74 (3) 417-433
Drug resistance of bacteria is a major medical problem because it severely limits the usefulness of virtually all known antimicrobial agents and often necessitates the administration of highly toxic drugs when the more acceptable ones are found to be ineffective.

At Boston City Hospital multiple drug resistance is now common among strains of Staphylococcus aureus 1 (Table 1) and in most species of gram-negative bacilli.

Although the search for new drugs has, to some extent, successfully kept pace with the emergence of drug resistance, there is no guarantee that this progress will continue.

Table 1. Frequency of Antibiotic Resistance in Staphylococcus aureus at the Boston City Hospital, 1966-1967 (482 Strains – Single-Disk Method).

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Percentage of Strains Resistant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillin</td>
<td>83.6</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>38.2</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>31.4</td>
</tr>
<tr>
<td>Kanamycin</td>
<td>20.3</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>8.0</td>
</tr>
<tr>
<td>Lincomycin</td>
<td>6.6</td>
</tr>
<tr>
<td>Nafcillin</td>
<td>2.9</td>
</tr>
<tr>
<td>Cephalothin</td>
<td>0.4</td>
</tr>
</tbody>
</table>
Lima, Peru
1969
St. Joseph Chapel
• Over 19 months 5,256 charts reviewed in 7 community hospitals: Nosocomial Infections.
• Fewer than 30% of patients receiving penicillin, sulfonamides, and streptomycin had recorded evidence of infection when the antibiotic was first given;
• Only 38% of 454 patients receiving antibiotics in 1969 had evidence of infection.
• Only between 24 to 76 % of patients with infection were receiving antibiotics.
Antibiotics development

- 1971 Cefazolin
- 1975 Tobramycin
- 1976 Amikacin
- 1977 Cefuroxime
- 1980 Piperacillin
- 1982 Ceftriaxone
- 1983 Ceftazidime
- 1985 Imipenem Cilastatin
- 1986 Aztreonam
- 1986 Aztreonam

Antibiotic resistance

- 1977 Tobramycin resistance
- 1977 Amikacin resistance
- 1987 Ceftazidime resistance
VANCOMYCIN-RESISTANT ENTEROCOCCI

Sir,—Vancomycin resistance among gram-positive organisms is rare,¹ ² except in some strains of Leuconostoc spp, lactobacilli, and pediococci.³ Since November 1986, 55 strains of vancomycin-resistant enterococci derived from twenty-two patients with end-stage renal failure or multiple organ failure, including acute renal failure, have been isolated at the Dulwich Public Health Laboratory. The sources of these enterococci included blood (8), intra-abdominal sepsis (8), urine (5), peritoneal fluid (2), pleural fluid (1), and bile (1). Colonisation of four central venous lines was detected at their exit sites. Faecal carriage of resistant organisms was present in some infected patients and in 1 without evidence of infection.

This report of high-level vancomycin resistance among enterococci associated with significant clinical infections is very worrying. The therapeutic options are limited. The use of vancomycin in this group of patients has been drastically restricted, and the frequency of isolation of resistant strains has fallen. Vancomycin has usually been regarded as a reserve drug for use against multiresistant gram-positive species. Its increasing use, especially for the “blind” treatment of patients at risk of infection with such organisms, may well lead to the development of resistance in organisms long regarded as universally susceptible.

Public Health Laboratory, Dulwich Hospital, London SE22 8QF

Antibiotics Reference Laboratory, Division of Hospital Infection, Central Public Health Laboratory, London NW9

Anne H. C. Uttley
C. H. Collins

Jay Naidoo
R. C. George
1988
Medical School at Major University of San Marcos.
National Hospital Guillermo Almenara Irigoyen, 1993
Nosocomial Outbreaks of Multiresistant Bacteria: Extended-Spectrum Beta-Lactamases Have Arrived in North America

Nosocomial Outbreak of *Klebsiella* Infection Resistant to Late-Generation Cephalosporins

Kenneth S. Meyer, MD; Carl Urban, PhD; Janet A. Eagan, BS, RN; Barbara J. Berger, MD; James J. Rahal, MD

Article, Author, and Disclosure Information
1993, Medical School
Toxicology Course
Emergency Hospital “Jose Casimiro Ulloa”  
1993 and 1994
Multidrug-Resistant *Enterococcus faecium*
An Untreatable Nosocomial Pathogen

*Richard V. Spera Jr*¹ and *Bruce F. Farber*²

1 Division of Infectious Diseases, Brooklyn Hospital Center, Brooklyn, New York, USA
2 Division of Infectious Diseases and Immunology, North Shore University Hospital, Cornell University Medical College, Manhasset, New York, USA
1995, National Hospital of the South, Arequipa Internship
Antimicrobial resistance among some organisms has increased to a stage where it can not be longer tolerated.

The need for preventive and corrective measures is urgent.

There is a strong association between antimicrobial usage and resistance.

Additional trials of antimicrobial use regulation will be required to determine the best methods to prevent and control this problem and ensure our optimal antimicrobial use “stewardship”.
Society for Healthcare Epidemiology of America and Infectious Diseases Society of America Joint Committee on the Prevention of Antimicrobial Resistance: Guidelines for the Prevention of Antimicrobial Resistance in Hospitals


From Wyeth-Ayerst Research (Dr. Shlaes), Pearl River, New York; Veterans’ Affairs Lakeside Medical Center (Dr. Gerding), Chicago, Illinois; UMDNJ-Robert Wood Johnson Medical School (Dr. John), New Brunswick, New Jersey; William S. Middleton Memorial Veterans’ Hospital (Dr. Craig), Madison, Wisconsin; SUNY Health Science Center (Dr. Bornstein), Syracuse, New York; Lahey Clinic (Dr. Duncan), Burlington, Massachusetts; Duluth Clinic Limited (Dr. Eckman), Duluth, Minnesota; St. Elizabeth Hospital (Dr. Farrer), Elizabeth, New Jersey; University Hospital (Dr. Greene), State University of New York, Stony Brook, New York; Bronx-Lebanon Hospital Center (Dr. Lorian), Bronx, New York; Tufts University School of Medicine (Dr. Levy), Boston, Massachusetts; Grady Memorial Hospital (Dr. McGowan), Atlanta, Georgia; New Jersey Department of Health (Dr. Paul), Trenton, New Jersey; Kaiser Permanente Medical Center (Dr. Ruskin), Los Angeles, California; Centers for Disease Control and Prevention (Dr. Tenover), Atlanta, Georgia; and St. Elizabeth Hospital Medical Center (Dr. Watanakunakorn), Youngstown, Ohio
Class Restriction of Cephalosporin Use to Control Total Cephalosporin Resistance in Nosocomial *Klebsiella*

James J. Rahal, MD; Carl Urban, PhD; David Horn, MD; Katherine Freeman, DrPH; Sorana Segal-Maurer, MD; James Maurer, MD; Noriel Mariano, BS; Sheila Marks, RN; Janice M. Burns, RN; Dana Dominick, RPh, MS; Mimi Lim, RN, MPA

JAMA October 14, 1998. Class withdrawal of Cephalosporins, Rahal et al
Internal Medicine Residency
2001-2004

Morristown Medical Center

Dr. Albert S Klainer
Infectious Disease Fellowship
East Carolina University, 2004-2006
McLeod Regional Med Ctr
495 beds

Carolina Hospital Systems
396 beds
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,3 David L. Paterson,4 Neil O. Fishman,3 Christopher F. Carpenter,10 P. J. Brennan,9 Marianne Billeter,11 and Thomas M. Hooton12

1Harborview Medical Center and the University of Washington, Seattle; 2Maine Medical Center, Portland; 3Emory University, Atlanta, Georgia; 4Hines Veterans Affairs Hospital and Loyola University Stritch School of Medicine, Hines; and 5Stroger (Cook County) Hospital and Rush University Medical Center, Chicago, Illinois; 6University of Utah, Salt Lake City; 7Mayo Clinic College of Medicine, Rochester, Minnesota; 8University of Pittsburgh Medical Center, Pittsburgh; and 9University of Pennsylvania, Philadelphia, Pennsylvania; 10William Beaumont Hospital, Royal Oak, Michigan; 11Ochsner Health System, New Orleans, Louisiana; and 12University of Miami, Miami, Florida

Antimicrobial Stewardship Guidelines, CID 2007:44 (15 January)
East Alabama Medical Center, 2009
Role of IDPs in ASPs
The Value of an Infectious Diseases Physicians Bring to the Infectious Diseases Physicians: Leading the Way in Antimicrobial Stewardship


1Montefiore Medical Center, Albert Einstein Medical Center, Bronx, New York; 2Vanderbilt University Medical Center, Nashville, Tennessee; 3Research and Medical Services Veterans Affairs Medical Center, Departments of Medicine, Pharmacology, Molecular Biology and Microbiology, Case Western Reserve University, and 4Cleveland Geriatric Research Education and Clinical Center, Case Western Reserve University–Veterans Affairs Medical Center, Center for Antimicrobial Resistance and Epidemiology, Ohio; 5Johns Hopkins University School of Medicine, Baltimore, Maryland; 6Carolinas Health Care System, Charlotte, North Carolina; 7Tufts Medical Center, Boston, Massachusetts; 8Providence-Portland Medical Center and 9Oregon Health Sciences University, Portland; 10Infectious Diseases Society of America, Arlington, Virginia; 11Harborview Medical Center, University of Washington, Seattle; 12HCA Healthcare, Nashville, Tennessee; 13Texas A&M College of Medicine, Houston; 14TeleMed2U, Roseville, California; and 15University of Florida College of Medicine, Gainesville
Challenges of Private IDPs in ASP

- General Challenges
  - Workforce,
  - Lack of involvement

- Other Challenges:
  - Time
  - Conflict
Total IDSA Members: 11709

Eligible survey responders US Based: 6793

Actual Survey Respondents: 2504

Primary Responsibilities:

- Patient care: 1606
  - Private Practice: 408 (25%)
  - Hospital/ Clinic: 523 (33%)
  - Academic Center: 675 (42%)
- Research: 490
- Public Health: 104
- Other: 304
SPECIAL ARTICLE

THE DOCTORS’ DILEMMA

Robert G. Petersdorf, M.D.

EDITORIAL

The Bell Tolls for the Infectious Diseases Clinician

F. Richard Ervin

From the Section of Infectious Diseases, Department of Medicine, McLane Regional Medical Center, Florence, South Carolina

[Editor's note—The following editorial submitted by Dr. Ervin is so provocative that it led us to invite comments from other infectious diseases clinicians. Drs. Berman and Ackley agreed to send us their opinions. We hope that the thoughts expressed by these three individuals will stimulate others to send us correspondence on the current and future fates of the infectious diseases practitioner. Since Dr. Petersdorf's address presented to the Infectious Diseases Society deals with some of the same issues, we decided to publish it in this issue also.]

EDITORIAL

Infectious Diseases Subspecialty: Declining Demand
Challenges and Opportunities

Pranatharthi Chandrashekar,1 Daniel Haviarcek,2,4 and Leonard B. Johnson3

1Division of Infectious Diseases, Wayne State University School of Medicine, Detroit; 2Division of Infectious Diseases, Michigan State University School of Human Medicine, Lansing; and 3Division of Infectious Diseases, St. John Hospital and Medical Center, Detroit, Michigan

Whither Infectious Diseases? Memories, Manpower, and Money

Robert G. Petersdorf

From the School of Medicine, University of California, San Diego, La Jolla, California
“ID specialty is Dead”
“No one calls ID consults anymore”
“Hospitalists and Intensivists do not consult ID because of cost containment”
“ID Consults are elective”
IDPs are “antibiotic doctors” or…..
Nothing to lose/offer in challenging case

“The Infectious Diseases Physician in the Future of Healthcare: Not only About Antibiotic Prescribing”.
Viewpoints. CID 2015:60 March 1st.
ID Crisis
ID Workforce

- During 2015 fellowship Match only 50% of ID fellowship spots were filled.
- Students with highest scores chose a surgical Specialty.
- ID physicians remain among the lowest-paid specialists.

Crisis in Infectious Diseases: 2 Decades Later
A Qualitative Study of the Real-world Experiences of Infectious Diseases Fellows Regarding Antibiotic Stewardship

Jake R. Morgan,1,2 Tamar F. Barlam,2,3 and Mari-Lynn Drainoni1,2,3

1Department of Health Policy and Management, Boston University School of Public Health, Boston, Massachusetts; 2Section of Infectious Diseases, Department of Medicine, Boston University School of Medicine, Boston, Massachusetts; 3Center for Healthcare Organization and Implementation Research, Edith Nourse Rogers Memorial Veterans Affairs Hospital, Bedford, Massachusetts
A Qualitative Study of the Real-world Experiences of Infectious Diseases Fellows Regarding Antibiotic Stewardship

FELLOWSHIP TRAINING AND ANTIBIOTIC STEWARDSHIP

We are studying antibiotic stewardship training in clinical fellowship programs and want to know:

- What is the current state of antibiotic stewardship training in clinical fellowship programs? Are there gaps in the training?
- How do fellows perceive the importance of antibiotic stewardship in their future career?
- How do fellows plan to integrate antibiotic stewardship into their future practice?

We want to talk to future infectious disease physicians, and potential steers of tomorrow, to learn how they view their stewardship activities in terms of their education and their career goals.

Current infectious disease clinical fellows are invited to participate in a confidential 30-minute telephone interview to discuss the ins and outs of the "real world" fellowship experience.

Those who participate in the interview will be offered a $50 Amazon gift card for their time.

If interested, please contact Jake Morgan at [jake.morgan@bu.edu](mailto:jake.morgan@bu.edu) to learn more.

Boston University School of Public Health
“We found that ID fellows do not think of stewardship in terms of a broader public health benefit and do not clearly view stewardship activities as best led by ID physicians.

“Nor do they appear to look to the physician ASP directors or other ID faculty for antibiotic and stewardship teaching”.

“Rather, they highly praise the ASP pharmacist as an invaluable resource, and several fellows believed that ASPs should be pharmacy-based programs.”
Every place is different
Culture
Familiarity with ID
Litigious vs Not litigious
Defensive Medicine
Ego
Time
Conflict
Audit and feedback and preauthorization are “diagnosis based” interventions.
Antagonistic Forces, Dilemmas in ASP

- Overuse/abuse vs Underuse: “An accurate diagnosis helps”
- Balance: Current Vs Future
- Hippocrates Oath:
  - “I will apply, for the benefit of the sick, all measures are required, avoiding those twin traps of overtreatment and therapeutic nihilism.”
IDPs

- Master Diagnostician
- Meticulous
- History and Physical vs Radiologic and laboratory studies
- Training, ID consults are elective
- Bedside superhero
EAMC

- 314 licensed beds
- MICU (20 beds)
- Orthopedic Surgery
- Cardiac Surgery
- CVICU (20 beds)
- General and Vascular Surgery
- Cancer Center
- Rheumatology Center

ASP team

- Ricardo Maldonado, MD
- Darrell Childress, Pharm D
- Chris Harrison, Pharm D
- Brooke Bailey, RN, Infection Control
- Jeff Payne, Microbiologist
Direct Cost Savings
Antimicrobial Stewardship Rounding

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>FY12</td>
<td>$90,168</td>
</tr>
<tr>
<td>FY13</td>
<td>$183,110</td>
</tr>
<tr>
<td>FY14</td>
<td>$79,313</td>
</tr>
<tr>
<td>FY15</td>
<td>$145,157</td>
</tr>
<tr>
<td>FY16</td>
<td>$166,239</td>
</tr>
<tr>
<td>FY17</td>
<td>$120,642</td>
</tr>
<tr>
<td>FY18</td>
<td>$123,350</td>
</tr>
<tr>
<td>FY19</td>
<td>$75,684</td>
</tr>
</tbody>
</table>
Cefepime Utilization
Days of Therapy per 1,000 Days at Risk

National Comparison by Teaching Status

This chart displays your institution’s Cefepime Utilization Rate compared nationally to other Teaching and Non-teaching hospitals.

Teaching hospitals are members of the Council of Teaching Hospitals (COTH).

<table>
<thead>
<tr>
<th>Teaching (26)</th>
<th>Non-teaching (158)</th>
<th>Your Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT / 1,000 DAR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2 2017</td>
<td>Q3 2017</td>
<td>Q4 2017</td>
</tr>
<tr>
<td>37.8</td>
<td>37.9</td>
<td>43.0</td>
</tr>
<tr>
<td>Q1 2018</td>
<td>Q2 2018</td>
<td>Q3 2018</td>
</tr>
<tr>
<td>47.3</td>
<td>46.4</td>
<td>46.9</td>
</tr>
<tr>
<td>Q4 2018</td>
<td>Q1 2019</td>
<td></td>
</tr>
<tr>
<td>49.3</td>
<td>50.0</td>
<td></td>
</tr>
</tbody>
</table>

Day of Therapy (DOT): patient days in which one or more doses of a drug was ordered.

Day at Risk (DAR): days present in hospital during analysis period.
# Piperacillin/Tazobactam Utilization

**Days of Therapy per 1,000 Days at Risk**

## National Comparison by Teaching Status

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Teaching (26)</th>
<th>Non-Teaching (155)</th>
<th>Your Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2 2017</td>
<td>73.7</td>
<td>77.1</td>
<td>73.9</td>
</tr>
<tr>
<td>Q3 2017</td>
<td>72.8</td>
<td>77.5</td>
<td>61.9</td>
</tr>
<tr>
<td>Q4 2017</td>
<td>71.0</td>
<td>76.7</td>
<td>61.3</td>
</tr>
<tr>
<td>Q2 2018</td>
<td>66.7</td>
<td>76.3</td>
<td>64.2</td>
</tr>
<tr>
<td>Q3 2018</td>
<td>67.2</td>
<td>75.4</td>
<td>58.7</td>
</tr>
<tr>
<td>Q4 2018</td>
<td>69.6</td>
<td>77.2</td>
<td>67.4</td>
</tr>
<tr>
<td>Q1 2019</td>
<td>70.7</td>
<td>77.1</td>
<td>71.1</td>
</tr>
<tr>
<td>Q2 2019</td>
<td>69.1</td>
<td>75.7</td>
<td>65.7</td>
</tr>
</tbody>
</table>

This chart displays your institution’s *Piperacillin/Tazobactam Utilization Rate* compared nationally to other Teaching and Non-teaching hospitals.

Teaching hospitals are members of the Council of Teaching Hospitals (COTH).

**Day of Therapy (DOT):** patient days in which one or more doses of a drug was ordered.

**Day at Risk (DAR):** days present in hospital during analysis period.
Carbapenem Utilization
Days of Therapy per 1,000 Days at Risk

National Comparison by Teaching Status

This chart displays your institution’s Carbapenem Utilization Rate compared nationally to other Teaching and Non-teaching hospitals.

Carbapenems include doripenem, ertapenem, imipenem, and meropenem.

Day of Therapy (DOT): patient days in which one or more doses of a drug was ordered.

Day at Risk (DAR): days present in hospital during analysis period.
Antibiotic Stewardship rounds

- Antibiogram at EAMC
- Sepsis Protocols for empiric antibiotic therapy that follows guidelines and local resistance patterns
- Dose optimization, IV to PO conversion. Kinetics
- Interventions: Audit and feedback 90%, Restriction 10%
  - Length of therapy
  - Streamline
  - Mismatch
Antibiotic Stewardship rounds

Antibiogram at EAMC

Sepsis Protocols for empiric antibiotic therapy that follows guidelines and local resistance patterns

Strategies: Prospective Audit with intervention and feedback 95%, Formulary Restriction with Preauthorization 5%

- Length of therapy
- Streamlining
- Mismatch
- Dose optimization
- IV to PO conversion
<table>
<thead>
<tr>
<th></th>
<th>Diagnosis</th>
<th>Diagnosis/culture-based recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sepsis protocols</td>
<td>Empiric</td>
<td>Based on syndrome</td>
</tr>
<tr>
<td>Length of therapy</td>
<td>Diagnosis</td>
<td>Diagnosis/culture-based recommendation</td>
</tr>
<tr>
<td>Streamline</td>
<td>Diagnosis</td>
<td>Diagnosis/culture-based recommendation</td>
</tr>
<tr>
<td>Bug-Drug Match</td>
<td>Diagnosis</td>
<td>Culture-Based Recommendation</td>
</tr>
</tbody>
</table>
Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines on the Management of Community-Acquired Pneumonia in Adults

Lionel A. Mandell, Richard G. Wunderink, Antonio Anzueto, John G. Bartlett, G. Douglas Campbell, Nathan C. Dean, Scott F. Dowell, Thomas M. File, Jr., Daniel M. Musher, Michael S. Niederman ... Show more

Clinical Infectious Diseases, Volume 44, Issue Supplement_2, 1 March 2007, Pages S27-S72, https://doi.org/10.1086/511159

Published: 01 March 2007
Diagnosis of CAP

“In addition to a constellation of suggestive clinical features, a demonstrable infiltrate by chest radiograph or other imaging technique, with or without supporting microbiological data, is required for the diagnosis of pneumonia.”

(Moderate recommendation; level III evidence.)
Management of Adults With Hospital-acquired and Ventilator-associated Pneumonia: 2016 Clinical Practice Guidelines by the Infectious Diseases Society of America and the American Thoracic Society
Diagnosis of HAP, VAP: Use of Procalcitonin, CRP and CPIS

- For patients with suspected HAP/VAP, we recommend using clinical criteria alone, rather than using serum PCT plus clinical criteria, to decide whether or not to initiate antibiotic therapy (strong recommendation, moderate-quality evidence).

- For patients with suspected HAP/VAP, we recommend using clinical criteria alone, rather than using bronchoalveolar lavage fluid (BALF) sTREM-1 plus clinical criteria, to decide whether or not to initiate antibiotic therapy (strong recommendation, moderate-quality evidence).

- For patients with suspected HAP/VAP, we recommend using clinical criteria alone rather than using CRP plus clinical criteria, to decide whether or not to initiate antibiotic therapy (weak recommendation, low-quality evidence).

- For patients with suspected HAP/VAP, we suggest using clinical criteria alone, rather than using CPIS plus clinical criteria, to decide whether or not to initiate antibiotic therapy (weak recommendation, low-quality evidence).

Management of Adults With HAP/VAP • CID 2016:63 (1 September)
Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria: 2019 Update by the Infectious Diseases Society of America


IDSA 2019 Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria • cid 2019:68 (15 May)
## Prevalence for asymptomatic bacteriuria for different populations

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy women, Premenopausal</td>
<td>1-5%</td>
</tr>
<tr>
<td>Postmenopausal</td>
<td>2.8-8.6%</td>
</tr>
<tr>
<td>Women with DM</td>
<td>10.8-16%</td>
</tr>
<tr>
<td>Men with DM</td>
<td>0.7-11%</td>
</tr>
<tr>
<td>Elderly Women</td>
<td>10.8-16%</td>
</tr>
<tr>
<td>Elderly Men</td>
<td>3.6-19%</td>
</tr>
<tr>
<td>Elderly men in LTC</td>
<td>15-50%</td>
</tr>
<tr>
<td>Elderly women in LTC</td>
<td>25-50%</td>
</tr>
<tr>
<td>Men or women with Spinal Cord Injury</td>
<td>23-69%</td>
</tr>
<tr>
<td>Persons with short term indwelling catheter</td>
<td>3-5%/ day</td>
</tr>
<tr>
<td>Persons with Chronic Indwelling catheter</td>
<td>100%</td>
</tr>
</tbody>
</table>
In older patients with functional and/or cognitive impairment with bacteriuria and delirium (acute mental status change, confusion) and without local genitourinary symptoms or other systemic signs of infection (eg, fever or hemodynamic instability), we recommend assessment for other causes and careful observation rather than antimicrobial treatment (strong recommendation, very low-quality evidence).

Remarks: For the bacteriuric patient with fever and other systemic signs potentially consistent with a severe infection (sepsis) and without a localizing source, broad-spectrum antimicrobial therapy directed against urinary and nonurinary sources should be initiated.

Classic symptoms of UTI include focal genitourinary symptoms such as urinary frequency, urgency, dysuria, and costovertebral angle tenderness. However, bacteriuric patients without these symptoms but with systemic signs such as change in mental status, delirium, or falls, may present a diagnostic challenge.

In practice, these patients are often treated with antibiotics for UTI. This is particularly true in patients with dementia or other conditions that limit the ability to communicate.
Diagnosis

ASP recommendations
I have been consulted…….

- Septic Knee
- Endocarditis
- Contaminated blood clot
- Candida Pneumonia
- FUO, sepsis of unknown origin
- MDR Klebsiella UTI
- Recurrent C. difficile Colitis
- Non resolving Pneumonia
- MRSA wound Infection after colectomy
- Pseudomonas Sinusitis

- Gouty Arthritis
- Marantic endocarditis, (SLE)
- First case in US of Curvularia Endocarditis
- Candida Colonization of respiratory tract
- Polyarticular Gout
- Asymptomatic bacteriuria
- Post Infectious Diarrhea after C.diff.
- Bronchiolitis Obliterans Pneumonia
- Granulomatous Folliculitis
- Pseudomonas sinus colonization after sinus irrigation
I have been consulted…….

- Infected Leg wound
- Infected leg wound
- Nasopharyngeal Aspergillosis
- Clivus Osteomyelitis
- Bilateral Empyema
- Gas Gangrene
- Sweet’s syndrome
- Pyoderma gangrenosum
- Aspergillus colonization snorting
- Prescription drugs
- Giant Cell arteritis
- Descending Mediastinitis
- Subcutaneous Heroin abuser
EAMC Stewardship Program

IV to PO conversion
Zosyn Extended infusion
Renal adjustment
TDMS Service (Vancomycin and aminoglycosides)

Antibiotic Stewardship Rounds: acceptance rate 98%
  - Audit and feedback 90%
  - Restriction Preauthorization 10% (perceived loss of autonomy, Tx delays)
Goals of Antimicrobial Stewardship

- Optimize Clinical outcomes
- Minimize toxicities and side effects
- Minimize the selection of pathogenic organisms (Clostridioides Difficile)
- Minimize emergence of resistance (CRE, MDR Pseudomonas, Acinetobacter)
- Reduce healthcare cost (secondary goal)
A mutually reinforcing drug interaction such that the joint effect of two drugs administered simultaneously is *greater than the sum* of their individual effects.
The Physician-Pharmacist Synergy

- Team work
- Strengths
- Improvement opportunities
- Common goals
- EBM.
- Boots on the ground
BEST ASP NEEDS BOTH: MD AND PHARMD.

IDPS MOST IMPORTANT ROLE IS BEING A DOCTOR. (“BOOTS ON THE GROUND”) 

PUSH THE QUALITY INITIATIVES, THE COSTS WILL TAKE CARE OF ITSELF.

EVERY HOSPITAL IS DIFFERENT: NO ONE SIZE FITS ALL 

RECOGNIZE YOUR PROGRAM’S BIGGEST CHALLENGES

SIGNIFICANT CHANGES TAKE TIME

MAKE SURE YOUR PROGRAM IS LONG LIVED AND LONG LIKED
END

- ricardo.maldonado@eamc.org
- darrell.childress@eamc.org