Antimicrobial Stewardship and the Infection Preventionist

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Associate Professor of Medicine
University of Minnesota Medical School
Physician Champion for Antimicrobial Management Team
University of Minnesota Medical Center
My background

* Infectious Diseases Physician
* Internist
* Care for patients in the outpatient ID clinic
* Do inpatient ID consults
* Chair Antibiotic subcommittee of the Fairview Formulary Committee
* Physician Champion for Antimicrobial Management Team
* Medical Director for Infection Control at UMMC
* Chair Infection Control Committee at UMMC
1. What is the background of the audience?
   a. RN
   b. Medical Technologist
   c. MPH
   d. Pharmacist
   e. MD
   f. LPN
   g. Other
Why do I think Antimicrobial Stewardship is important?

* Prevent further emergence of antimicrobial resistance!
* Prevent C. difficile diarrhea
* Prevent other adverse outcomes from unneeded antimicrobial use
* Help patients have good clinical outcomes
* Provide cost effective care
Antimicrobial Stewardship
KEY POINTS

* Why antimicrobial stewardship (ASP) is important
* How infection preventionists can get involved in ASP
  * How we started our antimicrobial stewardship program
  * Examples of Infection Preventionists’ ASP projects
Learning Objectives

* Be knowledgeable about what antimicrobial stewardship is
* Learn how antimicrobial stewardship can be started at your institution
* Know what the rolls are that the Infection Preventionist can play and who else needs to be on the team
ARS question #2

2. What is antimicrobial stewardship?
   a. Limiting use of antibiotics
   b. Give advice on best use of antibiotics to cure infections
   c. Follow outcomes of interventions
   d. All of the above.
Why might you be interested in antimicrobial stewardship?

* Hospitals are being asked by (CMS? CDC?) to start antimicrobial stewardship programs
* TJC now looks for ASPs during surveys
* IPs play an important roll in stewardship but this might be new for you
* New skill set
* New knowledge base
* New team members to work with pharmacists and prescribing providers
Figure 1-2. Partnership Between Antimicrobial Stewardship and Infection Prevention and Control Programs to Minimize Multidrug-Resistant Organism Transmission

Antimicrobial Stewardship

- Antibiotics Misuse/Overuse:
  - Treating nonbacterial illnesses
  - Treating noninfectious illnesses
  - Prolonged duration of antimicrobials
  - Using broad-spectrum antimicrobials when more targeted treatment will suffice

Unnecessary Use

Overextended Course

OVERUSE - OVERLY BROAD SPECTRUM

Infection Prevention & Control

- Poor HCW hand hygiene compliance
- Failure to isolate
- Inadequate environmental cleaning

Transmission from MDRO Infected Patient

Patient acquires MDRO colonization

- Infection
- Increased morbidity
- Increased hospitalization
- Increased healthcare costs
- Death
What is Antibiotic Stewardship?

Antibiotic Stewardship Program

An activity that includes appropriate selection, dosing, route, and duration of antimicrobial therapy
Antimicrobial Stewardship

* Primary goals:
  * Optimize clinical outcomes
  * Minimize unintended consequences
    * Toxicity
    * Selection of resistant or pathogenic organisms

* Secondary goal:
  * Reduce health care costs without adversely impacting quality of care and outcomes

CID 2007:44 (15 January)
Unintended effects of antibiotics

* Allergic reaction
* Acute kidney injury
* Liver injury
* Bone marrow suppression
* Antibiotic resistance
* Antibiotic associated diarrhea
  * C. difficile diarrhea, colitis, toxic megacolon
Antibiotic induced drug eruption
C. difficile clinical photos!
Urgent Threats
• Clostridium difficile
• Carbapenem-resistant Enterobacteriaceae (CRE)
• Drug-resistant Neisseria gonorrhoeae

Serious Threats
• Multidrug-resistant Acinetobacter
• Drug-resistant Campylobacter
• Fluconazole-resistant Candida (a fungus)
• Extended spectrum β-lactamase producing Enterobacteriaceae (ESBLs)
• Vancomycin-resistant Enterococcus (VRE)
• Multidrug-resistant Pseudomonas aeruginosa
• Drug-resistant Non-typhoidal Salmonella
• Drug-resistant Salmonella Typhi
• Drug-resistant Shigella
• Methicillin-resistant Staphylococcus aureus (MRSA)
• Drug-resistant Streptococcus pneumoniae
• Drug-resistant tuberculosis

Concerning Threats
• Vancomycin-resistant Staphylococcus aureus (VRSA)
• Erythromycin-resistant Group A Streptococcus
• Clindamycin-resistant Group B Streptococcus
Antimicrobial Stewardship

* Overarching goals
  * Decrease unneeded antibiotic use while improving patient outcomes
* Optimize antimicrobial use
  * Right drug
  * Right dose
  * Right timing
  * Right length of therapy
Infectious Diseases Society of America (IDSA) and the Society of Healthcare Epidemiology of America (SHEA) Guidelines for Developing an Institutional Program to Enhance Antimicrobial Stewardship

* The appropriate use of antimicrobials is an essential part of patient safety and deserves careful oversight and guidance

* The combination of effective antimicrobial stewardship with a comprehensive infection control program has been shown to limit the emergence of antimicrobial resistance

Audience response question #3

* What percent of antimicrobial prescribing is unneeded or inappropriate?
  
a. 70%
b. 50%
c. 25%%
d. 15%
Inappropriate antibiotic use

* It has been estimated up to 50% of all antibiotic use in hospitals is inappropriate based on several studies reported in the medical literature over the past 4 decades

Inappropriate antibiotic use: Two recent studies

* 399/1379 (29%) of patients receiving a broad spectrum antibiotic (i.e. a fluoroquinolone, Beta-lactam/beta-lactamase inhibitor, vancomycin, third or fourth generation cephalosporin, or carbapenem) did not have clinical justification to use them
  * Cosgrove SE. Abstract 279. Program and Abstracts of 15th Annual SHEA Meeting
* 41% of hospital patients had too broad antibiotic coverage
* 33% cases antibiotics were unnecessary
* 16% vancomycin was unnecessary
* 1% being given antibiotics for colonization or contamination
  * www.cdc.gov/drugresistance/healthcare/default.htm
Antibiotic Stewardship Programs: Positive Effects

* Successful programs have been able to document
  * Decreased antibiotic use (22%-36%)
  * Decreased costs ($200,000-900,000/yr)
  * Decreases in antibiotic resistant nosocomial infections

* Outcomes
  * No increase in mortality
  * Potentially shorter length of stay

Woodward R., Amer J of Med 1987; 83:817
Frank M., Clin Perform Qual Health Care 1997;5:180
Delit T. CID 2007;44: (15 Jan.)
Improve patient outcomes! (10)

* Increase cures
* Decrease LOS
* Decrease mortality
* Decrease adverse events
* Improve quality of life
* The most important but the hardest to show
* Show example of study that has shown the effects of ASP on outcome measure
Clinical outcomes in a randomized controlled trial comparing the Hospital of the University of Pennsylvania (HUP) program to usual practice

<table>
<thead>
<tr>
<th>Outcome</th>
<th>HUP program (n = 96)</th>
<th>Usual practice (n = 95)</th>
<th>Relative risk (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimicrobial appropriate</td>
<td>86 (90%)</td>
<td>30 (32%)</td>
<td>2.8 (2.1–3.8)</td>
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<tr>
<td>Cure</td>
<td>52/57 (91%)</td>
<td>34/62 (55%)</td>
<td>1.7 (1.3–2.1)</td>
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<tr>
<td>Failure†</td>
<td>5 (5%)</td>
<td>29 (31%)</td>
<td>0.2 (0.1–0.4)</td>
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<tr>
<td>Clinical</td>
<td>4 (4%)</td>
<td>10 (11%)</td>
<td>-</td>
</tr>
<tr>
<td>Microbiologic</td>
<td>0</td>
<td>10 (11%)</td>
<td>-</td>
</tr>
<tr>
<td>Superinfection</td>
<td>0</td>
<td>8 (8%)</td>
<td>-</td>
</tr>
<tr>
<td>Service changed antibiotic</td>
<td>0</td>
<td>8 (8%)</td>
<td>-</td>
</tr>
<tr>
<td>Adverse drug effect</td>
<td>0</td>
<td>5 (5%)</td>
<td>-</td>
</tr>
<tr>
<td>Recurrent infection</td>
<td>1 (1%)</td>
<td>2 (2%)</td>
<td>-</td>
</tr>
<tr>
<td>Resistance</td>
<td>1 (1%)</td>
<td>1 (1%)</td>
<td>0.13 (0.02–1.0)</td>
</tr>
</tbody>
</table>

How I got involved in antimicrobial stewardship

* Old restricted antibiotic system (84-06)
  * ID approval by phone calls
* New antimicrobial stewardship system (2007-)
  * Proactive team approach with chart reviews and feedback
UMMC/UMCH antibiotic restriction program

* Old System
  * Page the on call ID doctor for approval of restricted antibiotics
  * Prior to pharmacist approving order
* Strengths of old system
  * Strength was need for approval upfront
  * Need to have a phone conversation
  * Automatic stop on vancomycin after 48 hours
  * Auto stop on ceftazidime at 72 hours
UMMC/UMCH antibiotic restriction program

* Weaknesses in old system
  * Limited time to obtain data on patients we received calls on or review chart and or EMR
  * Limited follow-up
  * No dedicated Pharm D
  * Lack of written accessible guidelines on use of restricted antibiotics
  * High daily costs of antibiotics despite restriction program
  * Ongoing increase in antibiotic resistant bacteria and C. diff
Background

On Jan. 2, 2007 we began a new Antimicrobial Management Team (AMT) at the University of Minnesota Medical Center and the Univ. of MN Children’s Hospital, Fairview (UMMC/UMCH), University Campus.

The hospital is a 300 bed tertiary care facility on east campus
Our UMMC AMT goals were to:

* Decrease inappropriate use of antibiotics
* Optimize antibiotic use
* Decrease nosocomial acquisition of antibiotic resistant bacterial infections or colonization
* Decrease Clostridium difficile diarrhea cases
* Decrease antimicrobial costs and provide more cost effective care
IDSA and SHEA Guidelines on Antimicrobial Stewardship

* Stressed that antimicrobial stewardship should be a collaborative process
  * Infectious disease physician
  * Dedicated infectious disease pharmacist
  * Need support of pharmacy and hospital administration, medical staff leadership and local providers
  * Need collaboration with hospital infection control department and microbiology lab
UMMC/UMACH’s Antibiotic Management Team (AMT)

* Collaborative Project
  * Medical Leadership from and participation by Medicine, Surgery and Pediatric Infectious Disease Physicians
  * Leadership and Participation from the Pharmacy Dept.
  * Pharmacy and Therapeutics Committee
    * Antibiotic Sub-committee
      * Development of Restricted Antibiotic Use Guidelines
  * Hospital Infection Control Dept.
  * Microbiology Lab
UMMC/UMACH’s Antibiotic Management Team (AMT)

* Collaborative Project
* Medicine Infectious Disease Division Quality Improvement Project
  * ID Division faculty take turns rotating on the AMT Service
  * Physicians are reimbursed for time commitment for AMT rounds the week they are on call for AMT
Methods

* AMT allows providers to order restricted antimicrobials
  * according to our hospital guidelines
  * without upfront approval
  * retrospective chart review is done following day, M-F
  * by a dedicated Pharm D and a M.D. with infectious disease expertise
Pharm D with Infectious Disease Expertise rounds with Infectious Disease MD

* Patients’ charts are reviewed and discussed
* Includes labs, vital signs, radiology, progress notes
* Written recommendations placed in the electronic medical record as an AMT note
* Verbal recommendations may be made as well
How the AMT works

* Pharm D role
  * Discuss volume of charts reviewed (prescreening)#/day
    * 80-90 patients each Monday, 3-5 new patients Tues.-Fri.
    * These are patients on restricted agents

* Staff M.D. role adult services
  * Discuss 8/day cases reviewed in detail with Pharm D
    * Review of
      * Diagnosis/brief review of hospital course
      * Micro data
      * Radiology reports
      * Review of dose/route
      * Review of all antibiotics used
Physician Feedback Forms/Notes

* Discuss how many forms filled out ~ 5/day (Mon.-Fri.)
* Now notes go directly in the EMR
* If recommendations are urgent or time sensitive pages are placed to the physician to discuss recommendations
* Text pages may be sent
* Less urgent issues just have note left in the chart
Physician Feedback

- Need to be diplomatic
- Good to be helpful
- Good to be educational
- Goal is improved patient outcome
- Remember the note is part of the permanent EMR
- It is a medical legal document
- Goal is also to reinforce the indications for restricted agents and best practice guidelines
Hospital pharmacy department tracks

* Antibiotic utilization
* Numbers and types of interventions
* Acceptance rate of AMT recommendations
* Antibiotic costs per patient day
<table>
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<th>INTERVENTION CODES</th>
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<tr>
<td>#1 Change to more appropriate antibiotic based on lab data</td>
</tr>
<tr>
<td>#2 Change to alternative unrestricted anti-infective</td>
</tr>
<tr>
<td>#3 Discontinue one or more antibiotics (PO or IV)</td>
</tr>
<tr>
<td>#4 Change from IV to PO antibiotics</td>
</tr>
<tr>
<td>#5 Better empiric therapy</td>
</tr>
<tr>
<td>#6 Antibiotic dosage change</td>
</tr>
<tr>
<td>#7 Consult recommended</td>
</tr>
<tr>
<td>#8 Additional/Further diagnostic testing recommended</td>
</tr>
<tr>
<td>#9 Simplify antibiotic regimen</td>
</tr>
<tr>
<td>#10 Recommend change in post-op antibiotic duration</td>
</tr>
<tr>
<td>#11 Other</td>
</tr>
<tr>
<td>#12 Agree with management</td>
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</table>
## Intervention results

<table>
<thead>
<tr>
<th>AMT Interventions &amp; Acceptance Rates - Adult</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<tbody>
<tr>
<td>Total Interventions</td>
<td>1,991</td>
<td>2,165</td>
<td>2,665</td>
<td>2,340</td>
<td>2,098</td>
<td>2,264</td>
<td>2,417</td>
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<tr>
<td>Total Accepts</td>
<td>1,153</td>
<td>1,235</td>
<td>1,626</td>
<td>1,381</td>
<td>1,267</td>
<td>1,376</td>
<td>1,531</td>
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<tr>
<td>Total Declines</td>
<td>468</td>
<td>518</td>
<td>541</td>
<td>439</td>
<td>453</td>
<td>458</td>
<td>423</td>
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<tr>
<td>Total Agree w/Management</td>
<td>370</td>
<td>412</td>
<td>498</td>
<td>520</td>
<td>378</td>
<td>430</td>
<td>463</td>
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</tbody>
</table>
Results for the first two years of the program

* Total cost savings = $732,758
* Costs savings has been impacted by:
  * drug contracting
  * decrease in overall utilization
<table>
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<tbody>
<tr>
<td>Total Expenditures</td>
<td>$5,712,589</td>
<td>$4,954,776</td>
<td>$4,841,578</td>
<td>$4,396,983</td>
<td>$5,081,645</td>
<td>$5,916,825</td>
<td>$3,766,276</td>
<td>$3,180,736</td>
<td>$3,936,274</td>
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<tr>
<td>Total Patient Days</td>
<td>96,791</td>
<td>95,709</td>
<td>98,910</td>
<td>99,090</td>
<td>101,949</td>
<td>97,692</td>
<td>89,311</td>
<td>87,479</td>
<td>93,343</td>
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<tr>
<td>Cost per Patient Day</td>
<td>$59.02</td>
<td>$51.77</td>
<td>$48.95</td>
<td>$44.37</td>
<td>$49.84</td>
<td>$50.33</td>
<td>$42.17</td>
<td>$36.36</td>
<td>$42.17</td>
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</table>
Infection Prevention Department tracks

* Hospital acquired (HA) antibiotic resistant bacterial infections
  * MRSA
  * VRE
  * ESBLs
  * C. difficile diarrhea
CDI RATE TREND DOWNWARD 2007-2014

In-patients with C. difficile infection (CDI) that meet criteria for
Hospital Acquired Infection
University and Riverside Campuses
January 2007-March 2014
MULITDRUG RESISTANT HAI RATES DOWN

University of Minnesota Medical Center and University of Minnesota Children's Hospital
Number of Hospital Associated Infections with MRSA, VRE, & ESBL

<table>
<thead>
<tr>
<th>Year</th>
<th>MRSA</th>
<th>VRE</th>
<th>ESBL</th>
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<tr>
<td>2009</td>
<td>0.53</td>
<td>0.20</td>
<td>0.11</td>
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<td>2010</td>
<td>0.29</td>
<td>0.09</td>
<td>0.13</td>
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<tr>
<td>2011</td>
<td>0.31</td>
<td>0.17</td>
<td>0.13</td>
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<tr>
<td>2012</td>
<td>0.24</td>
<td>0.16</td>
<td>0.14</td>
</tr>
<tr>
<td>2013</td>
<td>0.22</td>
<td>0.12</td>
<td>0.09</td>
</tr>
</tbody>
</table>
Infectious Disease Diagnostics Lab tracks

* Antimicrobial resistance and susceptibility
* Antibiograms
* Incorporates emerging technology for more rapid susceptibility resistance reporting
### ANTIBIOMgram - Gram-Negative Bacteria

Clinical Microbiology Laboratory, University of Minnesota Medical Center, Fairview

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Acinetobacter baumannii complex</th>
<th>Citrobacter freundii</th>
<th>Enterobacter aerogenes</th>
<th>Enterobacter cloacae complex</th>
<th>E. coli†</th>
<th>Klebsiella oxytoca*</th>
<th>Klebsiella pneumoniae*</th>
<th>Morganella morgans</th>
<th>Proteus mirabilis</th>
<th>Pseudomonas aeroginosa*</th>
<th>Pseudomonas aeruginosa*</th>
<th>Bacteroides fragilis complex</th>
<th>Serratia marcescens</th>
<th>Streptococcus mitis/spp.</th>
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</thead>
<tbody>
<tr>
<td>Amikacin</td>
<td>95% (56)</td>
<td>100% (143)</td>
<td>100% (171)</td>
<td>99% (555)</td>
<td>99.9%</td>
<td>100% (555)</td>
<td>99% (1237)</td>
<td>100% (45)</td>
<td>100% (481)</td>
<td>94% (969)</td>
<td>94% (1763)</td>
<td>0% (139)</td>
<td>98% (163)</td>
<td>NT</td>
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<tr>
<td>Ampicillin</td>
<td>0% (64)</td>
<td>0% (141)</td>
<td>0% (141)</td>
<td>0% (141)</td>
<td>56%</td>
<td>0% (1318)</td>
<td>0% (1318)</td>
<td>0% (53)</td>
<td>89% (521)</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
</tr>
<tr>
<td>Ampicillin/</td>
<td>94% (64)</td>
<td>0% (141)</td>
<td>0% (141)</td>
<td>0% (141)</td>
<td>62%</td>
<td>0% (1256)</td>
<td>66% (493)</td>
<td>66% (493)</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
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<tr>
<td>Sulbactam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Aztreonam</td>
<td>NT</td>
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<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>54% (1761)</td>
<td>1% (137)</td>
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<td>Cefazolin</td>
<td>0% (63)</td>
<td>0% (162)</td>
<td>0% (162)</td>
<td>91% (507)</td>
<td>63%</td>
<td>95% (521)</td>
<td>94% (1764)</td>
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<td>NT</td>
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<tr>
<td>Cefepime</td>
<td>70% (66)</td>
<td>98% (162)</td>
<td>97% (162)</td>
<td>97% (509)</td>
<td>99.9%</td>
<td>100% (323)</td>
<td>96% (1316)</td>
<td>96% (1316)</td>
<td>100% (521)</td>
<td>84% (1044)</td>
<td>41% (1762)</td>
<td>1% (139)</td>
<td>99% (184)</td>
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<td>Cefotaxime</td>
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<td>NT</td>
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<td>NT</td>
<td>NT</td>
<td>24% (1762)</td>
<td>1% (137)</td>
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<td>NT</td>
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<td>Cefoxitin</td>
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<td>0% (126)</td>
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<td>97%</td>
<td>95% (32)</td>
<td>47% (348)</td>
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<td>10% (45)</td>
<td>NT</td>
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<td>NT</td>
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<td>Ceftazidime</td>
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<td>81% (161)</td>
<td>90% (161)</td>
<td>90% (161)</td>
<td>98%</td>
<td>100% (323)</td>
<td>96% (1316)</td>
<td>89% (1316)</td>
<td>99.9% (520)</td>
<td>87% (1044)</td>
<td>63% (1763)</td>
<td>19% (139)</td>
<td>94% (409)</td>
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<td>79% (162)</td>
<td>85% (162)</td>
<td>85% (162)</td>
<td>98%</td>
<td>99.9% (323)</td>
<td>96% (1315)</td>
<td>89% (1315)</td>
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<td>95% (184)</td>
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<td>Ciprofloxacin</td>
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<td>56% (162)</td>
<td>96% (162)</td>
<td>93% (509)</td>
<td>63%</td>
<td>99% (521)</td>
<td>95% (1045)</td>
<td>83% (1763)</td>
<td>73% (1763)</td>
<td>39% (139)</td>
<td>4% (154)</td>
<td>91% (184)</td>
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<td>NT</td>
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<td>Gentamicin</td>
<td>88% (67)</td>
<td>91% (162)</td>
<td>92% (162)</td>
<td>92% (162)</td>
<td>98%</td>
<td>97% (521)</td>
<td>92% (1045)</td>
<td>95% (1045)</td>
<td>87% (1763)</td>
<td>24% (1763)</td>
<td>0% (139)</td>
<td>96% (184)</td>
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<td>Imipenem</td>
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<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>57% (1762)</td>
<td>8% (139)</td>
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<tr>
<td>Levofloxacin</td>
<td>85% (65)</td>
<td>85% (162)</td>
<td>96% (162)</td>
<td>96% (162)</td>
<td>93%</td>
<td>83% (162)</td>
<td>99% (1317)</td>
<td>95% (1317)</td>
<td>85% (521)</td>
<td>84% (1042)</td>
<td>66% (1763)</td>
<td>7% (139)</td>
<td>93% (416)</td>
<td>NT</td>
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<tr>
<td>Meropenem</td>
<td>96% (59)</td>
<td>100% (141)</td>
<td>100% (141)</td>
<td>100% (141)</td>
<td>99.9%</td>
<td>100% (298)</td>
<td>98% (479)</td>
<td>100% (479)</td>
<td>85% (960)</td>
<td>71% (1763)</td>
<td>74% (139)</td>
<td>98% (184)</td>
<td>NT</td>
<td>NT</td>
</tr>
<tr>
<td>Piperacillin</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>62% (1760)</td>
<td>9% (139)</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
<td>NT</td>
</tr>
<tr>
<td>Piperacillin/</td>
<td>86% (55)</td>
<td>84% (156)</td>
<td>85% (177)</td>
<td>95% (507)</td>
<td>96%</td>
<td>95% (1303)</td>
<td>96% (513)</td>
<td>99% (990)</td>
<td>87% (1763)</td>
<td>65% (139)</td>
<td>40% (116)</td>
<td>95% (116)</td>
<td>NT</td>
<td>NT</td>
</tr>
<tr>
<td>Tazobactam</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

* Non-cystic fibrosis cultures
** Cystic fibrosis cultures
Getting Started: engaging physicians from the start

* Choose a physician leader with pharmacy and administrative support
* Setting restricted antimicrobial list (formulary committee)
* Deciding on indications for use of restricted agents
* Get feedback from important physician groups or leaders
* Developing evidence based antibiotic use guidelines for common clinical conditions (& order sets)
Engaging Physicians: incorporating stewardship into practice

* Daily rounds with physician and pharmacist
* Recommendations in the chart
* Phone calls
* Text pages
* Feedback
* Monitor patient response and outcomes
* Monitor success/acceptance of recommendations
Practical Pearls for Effective Sustainable Stewardship Programs: Top Ten List

* (1) Be helpful
* (2) Be respectful
* (3) Show your value
* (4) Work on issues important to your institution
* (5) Measure important process measures and
* (6) Measure important outcomes
* (7) Get a single win and demonstrate the value of that win
* (8) Changing provider behavior is a key factor
* (9) Stewardship is a collaborative process
* (10) Improve patient outcomes!
Influence Prescriber Behavior (8)

* Be helpful (1)
  * Make your provider’s work easier and better
  * Give them good advice
  * Work on issues that providers care about
  * Everyone’s goal is a good patient outcome
  * Fit into provider’s daily work flow
Influence Prescriber Behavior (8)

* Be respectful (2)
  * Be diplomatic
  * Acknowledge provider’s knowledge and expertise
  * Avoid disparaging comments
  * Take a team approach
Antimicrobial stewardship notes

* Develop a good communication process
* Determine best methods to communicate your guidance
* Show examples of our AMT notes
Influence Prescriber Behavior

* Physicians and surgeons want their patient to have a good outcome
* Help them achieve a good patient outcome
* Use evidence based guidelines
* Collect data to show effects of intervention
* Above all do no harm
Evidence Based Medicine

* ASP should be supported by:
  * Clinical data
  * Clinical studies
  * Expert and Local Guidelines

* Be evidence based!
  * IDSA guidelines
  * Studies supporting length of therapy
  * Shorter courses supported by data (give example)
Interventions to measure to determine success of ASP

* (1) Stopping antibiotics
* (2) Decreasing duration of antibiotics
* (3) Narrowing or otherwise improving therapy
* (4) IV to PO switch
* (5) Switching from one broad spectrum agent to another
Example of IP driven ASP QI project

* Decreased length of standard antibiotic course for UTI
  * Based on IDSA guidelines to treat UTIs
  * Utilized EMR prescribing to increase compliance
Influence Prescriber Behavior

* Look for benchmarking measures
* Provide feedback to prescribers-private
* One on one peer feedback on prescribing practices
* Low prescribers explain what they do to high prescribers
Show your value (3)

* Focus on value
  * Better quality
  * For less money

* Get a single win and demonstrate your value
  * Decreased antimicrobial expenditures
  * Decreased days of therapy
What metrics can be used to measure impact of ASP?

* Decreased C. difficile diarrhea rates
* Decreased MDROs
* Decreased DDD or DOT
* Decreased antimicrobial resistance on antibiogram
* Decreased Length of Stay
* Increased cure rate
* Decreased readmissions
* Decreased unintended consequences
* Decreased mortality or no increase in mortality (show examples of all of the above)
Work on issues important to your institution (4)

* If antibiotic costs are important then address this issue
* Where are excess costs occurring?
* Are the antibiotics being used appropriate?
* Which are the problem antibiotics?
* For which indications are they being used?
* Discuss how to address potential prescribing problems
Determine what your institution is interested in

* Collect data on that measure
* Determine if you ASP is impacting that measures
* If it isn’t determine what else needs to be done
Develop restricted antibiotic guidelines to address problem antibiotics

* Are MDROs important to your institution?
* What problems are you having?
* Example of vancomycin prescribing
* Developed guidelines for appropriate indications for use
* Auto stop at 48 hours if guidelines not followed
* Need to take a close look at the patient to determine if the use is indicated or warranted or justifiable or not
* Not an expensive antibiotic but selects for VRE
* Additional adverse side effects nephrotoxicity
Outcome Measures

* Measure important process measures (5)
  * What process measures should you measure?
* Measure important outcomes (6)
  * What outcome measures should you measure?
  * MDRO and C. difficile data?
C. difficile as an outcome measure

* This is increasing being looked at as a good outcome measure to track effectiveness of antimicrobial stewardship
* Multi-factorial
* Ideally want to show impact of stewardship efforts such as decreased volume of antibiotic use associated with decreased C. difficile rates
* We know there are other things that effect C. difficile rates
  * Infection Control, isolation, hand washing, cleaning of the environment
Get a single win (7)

* Demonstrate the value of that win (7)
* We decreased antibiotic costs or
* We decreased antibiotic doses or
* We decreased length of stay in the ICU
* We improved patient outcomes
Changing prescriber behavior

* Changing prescriber behavior is a key factor in improving antibiotic use in the long run
* But changing behavior is hard and the solution is likely multi-factorial
* Impact of consistent messages from ASP shows up over time in the prescribers’ notes
What This Means

* Antibiotic Management Teams can have a positive impact on
  * Overall use of antibiotics, decrease volume (decrease inappropriate use)
  * Decrease in overall antibiotic costs
  * Positive impact on antibiotic resistant bacteria
  * Decreased C. difficile diarrhea
  * No negative impact on patient outcome, potential positive impact on patient outcome
12 Steps to Prevent Antimicrobial Resistance: Hospitalized Adults

1. Vaccinate
2. Get the catheters out
3. Target the pathogen
4. Access the experts
5. Practice antimicrobial control
6. Use local data
7. Treat infection, not contamination
8. Treat infection, not colonization
9. Know when to say "no" to vanco
10. Stop treatment when cured
11. Isolate the pathogen
12. Break the chain

Prevent Transmission
Use Antimicrobials Wisely
Diagnose & Treat Effectively
Prevent Infections
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  * Mark Schliess, Pat Ferriera
  * Phil Peterson, Jo-Anne Young, Winston Cavert, Paul Bohjanen, Dave Boulware, Bryan Rock, David Strike, Dan Zydowich, Jamie Green, Edwin Periera
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  http://www.cdc.gov/getsmart/healthcare/implementation/core-elements.html
Questions