Getting Your Antimicrobial Stewardship Program Off the Ground in the Small and Rural Setting

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Disclosures

All planners, presenters, reviewers, and ASHP staff of this session report no financial relationships relevant to this activity.
Learning Objectives

• List the regulatory requirements that pertain to critical access hospitals in regard to antimicrobial stewardship.
• Identify key stakeholders necessary to implement an antimicrobial stewardship team at a rural facility.
• Discuss the antimicrobial stewardship gaps that may occur in the rural realm.
• Describe successful strategies used to educate staff and patients on antimicrobial stewardship.
Self Assessment Question 1 – Polling Slide

Which of the following is NOT an element of performance listed under The Joint Commission’s antimicrobial stewardship standard (MM.09.01.01)?

a) Organizational leaders establish antimicrobial stewardship as a priority
b) Education is provided to staff regarding antimicrobial stewardship
c) The antimicrobial stewardship program identifies a list of restricted antibiotics
d) An antimicrobial stewardship program is to involve a multidisciplinary team
Self Assessment Question 2 – Polling Slide

Which of the following is a tool that can be used to educate staff on antimicrobial stewardship?

a) Annual computer based training modules required by all staff  
b) In person training during new hire orientation  
c) News capsules or newsletters  
d) All of the above
Which of the following strategies can help overcome barriers of antimicrobial stewardship programs in the small and rural setting?

a) Consultation services
b) Telehealth
c) Information technology
d) All of the above
Antimicrobial Stewardship: Enough Already!

• Hot topic for years
• Regulatory bodies requiring stewardship programs
  – CDC
  – CMS
  – States
  – Health Systems
• Easier said than done
Antimicrobial Stewardship: Enough Already!

YOU GET ANTIBIOTICS, AND YOU GET ANTIBIOTICS....

EVERYBODY GETS ANTIBIOTICS!

117 Years! World's Oldest Woman Says Piptaz 4.5g iv qid Is the Secret

04-19-2017 - Charlene Aaron
The Joint Commission Standards (MM.09.01.01)

1. Leadership commitment
2. Staff education
3. Education to patients and families (removed)
4. Multidisciplinary team
5. Program encompasses the CDC core elements
6. Multidisciplinary protocols
7. Collects, analyzes and reports data
8. Takes action on improvement opportunities
Where Do You Start?

THE LOOK I GIVE

WHEN I'M COMPLETELY OVERWHELMED
Practice Setting

- 8 hospital health system serving WI and Upper MI
- 6 CAH
- 50+ clinics, home health, hospice, LTC, Critical Care Transport
Where Do You Start?

- Identify core group
- Draft an organized layout of standards
# Where Do You Start?

**AMHC Antimicrobial Stewardship Charter**

**Joint Commission - MM.09.01.01**

<table>
<thead>
<tr>
<th>Task</th>
<th>Target completion date</th>
<th>Committee approvals needed</th>
<th>Committee communications needed</th>
<th>Professional resources needed</th>
<th>Tangible resources needed</th>
<th>Date of completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modify IP Plan to include Antimicrobial Stewardship</td>
<td>July 30 17’</td>
<td>N/A</td>
<td>N/A</td>
<td>Senior Leadership for budgeting only</td>
<td>None</td>
<td>Complete</td>
</tr>
</tbody>
</table>

**Tactics**

- AMS charter progress updates to leadership - Finished initial charter to Rick N and Barb L - Completed
- Compensation budget for provider and pharmacy champions - Senior leadership consideration - Tentative future initiative
- FTE summary for AMS work to leaders - Codee Misty and I will do a time study for next 3 months to present to leadership as basis to determine FTE needs for AMS needs at AMHC - Tentative future initiative
- Misty to add AMS needs to IP risk assessment and plan - Completed August 2017
- Pt days on antibiotics and use by antibiotic reports from EMR for data tracking - collecting - Completed
### Where Do You Start?

<table>
<thead>
<tr>
<th>Initiative</th>
<th>MOS</th>
<th>Implementation plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>JC Element of Performance Measures: MM.09.01.01</td>
<td>MM.09.01.01, EP2</td>
<td>Educate staff and licensed independent practitioners involved in antimicrobial ordering, dispensing, administration, and monitoring about antimicrobial resistance and antimicrobial stewardship practices. Education occurs upon hire and annually thereafter.</td>
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<tr>
<td></td>
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<td>5.1.16 - Education subgroup was formed to address this topic. -&gt; CPS has pharmacy portal for pharmacist to complete. -&gt; Pharmacist Competencies were completed in FY16. -&gt; Antibiogram orientation occurs upon hire and annually.</td>
</tr>
</tbody>
</table>
| | | ACTION PLAN  
1. Develop CBT for provider - Hire and annually - Antibiogram system policy. |
| | | ACTION PLAN  
1. Develop CBT for provider - Hire and annually - Antibiogram system policy  
Notes: 
- 9.18.13 - Education subteam has draft of CBT. Q3 council provided feedback to ensure we work with credentialing department of implement required education |
| | | 2. Assign CBT to all licensed independent practitioners  
Notes: |
| | | Hospital 1  
Hospital 2  
Hospital 3  
Hospital 4  
Hospital 5  
Hospital 6  
Hospital 7  
Hospital 8  
Hospital 9  
Hospital 10  
Hospital 11  
All pharmacists have training. Have opportunities for CPTs/Physicians. |
Where Do You Start?

• Recruitment of committee members
• Education/certification if feasible for providers/RPHs
• Leadership engagement
Recruiting The A-Team

- Outlined by TJC (EP4)
  - ID physician
  - Infection preventionist
  - Pharmacist
  - Practitioner
- Also highly recommend:
  - IT
  - Front line staff (RN/CNA/Medical Assistants)
  - Quality
  - Leadership
  - Lab
Now That Everyone Has Arrived

- Review the tools
- Establish goals
- Develop a policy outlining objectives and goals of your program

https://www.cdc.gov/antibiotic-use/healthcare/implementation/core-elements.html
Now That Everyone Has Arrived

• Tackle low hanging fruit
• Identify opportunities feasible with current resources available
  – IV to PO, renal dosing, PK/PD dosing, pharmacy driven vanco/AG protocol
The Wheels Are Turning

• Some education examples
  – Computer based training
  – Orientation education for all new employees
  – Education in after visit summary/discharge instructions to patients sent home on an antibiotic
  – News capsules
  – Community education
  – Intranet site
The Wheels Are Turning

• Tracking and measuring (involve IP, IT)
  – Track trends and meaningful information
  – Provider prescribing trends/scorecard
  – Utilizing information IP is already reporting
Health System Resources

- ID physician(s)
- ID pharmacist(s)
- IT resources
- Lab
Examples Utilizing Health Systems

• Best Practice Alerts
• Indication “buttons” when ordering antibiotics
• “Blue Card”
• System Scorecard
## Examples Utilizing Health Systems – “Blue Card”

<table>
<thead>
<tr>
<th>NQX</th>
<th>ASHP INTERSNA 2013 INDUSTRY</th>
<th>ANTI-ANEMIA REPORTS</th>
<th>COCHRANE</th>
<th>DODS 2016</th>
<th>GBRI 2017</th>
<th>OXITIV COCO</th>
<th>2018</th>
</tr>
</thead>
</table>

### Notes
1. **Blue Card**
   - Reimbursement for certain services and medications
   - Coverage includes:
     - Hematopoietic growth factors
     - Erythropoietin
     - Other hematopoietic medications

### Additional Information
- **Coverage Guidelines**
  - Generally covers patients with certain hematological disorders
  - Requires prior authorization for certain medications

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**References**

- American Society of Hematology
- National Institutes of Health
- Various tertiary care centers

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**Clinical pearls**

- Hematologically compromised patients may benefit from prophylactic transfusions
- Monitoring hemoglobin levels crucial for managing anemia

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**Conclusion**

Utilization of these health systems significantly improves outcomes and access to treatment for hematological patients.
Examples Utilizing Health Systems – “Blue Card”

I. ANTIMICROBIAL STEWARDSHIP
1) Before initiating empiric therapy or changing antibiotics (gels) due to lack of response to a current regimen, make certain that all relevant cultures have been obtained or repeated.
2) Switch & De-escalate: “switch TV to PCO,” and change to narrower-spectrum agent(s) (“de-escalate”) based on microbiology results.
   • Consider discontinuing Vancomycin if cultures are negative for MRSA, MRSE, or penicillin-resistant Enterococci; and, no IN of Vancomycin colonization, and, no Type I allergy to penicillins (PCNs).
   • Combination therapy with (Ceftriaxone OR Levofloxacin) PLUS (Pip-Tazo, Cefepime, OR Aztreonam) is not beneficial beyond 48h - (Cipro or Levo) should be discontinued.
3) ESBL - Imipenem is the drug of choice for infections due to ESBL-producing Gram-negative rods, except for Pseudomonas, which would require Meropenem.
4) Brevanillin: Levofloxacin, TMP/SMX, Clnadmycin, Azithromycin, Fluoroquinolones, and Metronidazole are highly bioavailable (90-100% GI absorption). They should be given PO if the GI tract is functional.
5) Use of Cephalosporins in Patients with Penicillin (PCN) Allergy: After taking a careful history, cephalosporins may be given safely to any patient without a history of a Type I or CIC to PCN (Immediate hypersensitivity - Shock, anaphylaxis, angioedema).
6) Empiric antimicrobial choices in EPIC order sec – KWH Blue Card – Empic Antibiotics

II. SEPSIS OF UNKNOWN ETIOLOGY
1) Community-Acquired/Normal Host: Ceftriaxone 2g q 24h PLUS Vancomycin 1g q 24h (if septic shock)
2) Healthcare-Associated/Comorbid Host [Pip-Tazo 3.375g q 8hr (4x6) PLUS Vancomycin] OR (Cefepime 1g q 8hr PLUS Vancomycin) PLUS Tobramycin 1g q 8hr with above options (if septic shock)
3) Type I PCN Allergy: Aztreonam 3g q 24h PLUS Vancomycin 1g q 24h PLUS Tobramycin 7mg/kg q 24h

III. SKIN AND SOFT TISSUE INFECTIONS
   • Nonpurulent/Moderate Severity: Cefazolin
     - Preferred: Periactin G 4 million units q 6h (Alternative: Cefazolin 1-2g q 8h)
     - Type I PCN Allergy: Vancomycin
   • Purulent (Abscess): I&D + C&S.
     - TMP/SMX 1-2DS q12h OR Dorycloline 100mg q12h (if severe: Vancomycin). Switch to Nalidix or Cefepime if MSSA in C&S.
   • Nonpurulent/Severe (Neurologic): Surgical intervention (C&S).
     - Pip-Tazo 3.375g q 8hr (4x6) PLUS Clnadmycin 600mg q 8hr PLUS Vancomycin
     - Type I PCN Allergy: Aztreonam 2g q 8hr PLUS Metronidazole 500mg q 8hr PLUS Linezolid 600mg q 12h
     - Diabetic or Immune Foot Infection: (After deep tissue, or bone biopsy culture): Pip-Tazo 3.375g q 8hr (4x6) PLUS Vancomycin OR (Cefepime 1g q 8hr PLUS Vancomycin) PLUS Metronidazole 500mg q 8hr
     - D/C Vanco if no MRSA/MRSE/Enterococcus
     - Type I PCN Allergy: Aztreonam 2g q 8hr PLUS Metronidazole 500mg q 8hr PLUS Vancomycin

IV. COMMUNITY-ACQUIRED PNEUMONIA (CAP)
   • Ceftriaxone 1g q 24h PLUS (Azithromycin 500mg q 24h OR Dorycloline 100mg q12h)
   - Type I PCN Allergy: Vancomycin 1g q 24h
   - If aspiration, add Metronidazole to above regimens

V. HOSPITAL-ACQUIRED/VENTILATOR-ASSOCIATED PNEUMONIA (HAP/VAP)
   • (Cefepime 1g q 8hr OR Pip-Tazo 3.375g q 8hr) PLUS Vancomycin (By C Vancomycin at 48h if no MRSA in a quality respiratory culture)
   - Type I PCN Allergy: Aztreonam 2g q 24h PLUS Tobramycin 7mg/kg q 24h PLUS Vancomycin
   - Consider addition of inhaled Tobramycin
   - If aspiration, add Metronidazole to (Cefepime OR Aztreonam) above
   - Duration = 7 days (including Pseudomonas)
### Intravenous Antimicrobial Renal Dose Adjustments

<table>
<thead>
<tr>
<th>Antimicrobial</th>
<th>Usual Dose</th>
<th>CVRF ≤ 20mL/min</th>
<th>CVRF &gt; 20mL/min</th>
<th>CVRF &gt; 30mL/min</th>
<th>HD*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ampicillin</strong></td>
<td>1-2g q8-12h</td>
<td>1-2g q8-12h</td>
<td>1-2g q8-12h</td>
<td>1-2g q8-12h</td>
<td>HD: 1-2g q8-12h</td>
</tr>
<tr>
<td><strong>Ampicillin/β-lactamase</strong></td>
<td>1.5-3g q6-12h</td>
<td>1.5-3g q6-12h</td>
<td>1.5-3g q6-12h</td>
<td>1.5-3g q12h</td>
<td>HD: 1.5-3g q12h (post HD)</td>
</tr>
<tr>
<td><strong>Astramam</strong></td>
<td>2-3g q6-12h</td>
<td>2-3g q6-12h</td>
<td>2-3g q6-12h</td>
<td>2-3g q6-12h</td>
<td>HD: 2-3g q6-12h (post HD)</td>
</tr>
<tr>
<td><strong>Cefazolin</strong></td>
<td>1-2g q6-12h</td>
<td>(&gt;30 mL/min) 2-3g q6-12h</td>
<td>(≤ 30 mL/min) 6-8g q6-12h</td>
<td>1g q24h</td>
<td>HD: 1g q24h (post HD)</td>
</tr>
<tr>
<td><strong>Cefepime</strong></td>
<td>2-3g q6-12h</td>
<td>2-3g q6-12h</td>
<td>2-3g q6-12h</td>
<td>2-3g q6-12h</td>
<td>HD: 2-3g q6-12h (post HD)</td>
</tr>
<tr>
<td><strong>Ceftazidime</strong></td>
<td>2-3g q6-12h</td>
<td>2-3g q6-12h</td>
<td>2-3g q6-12h</td>
<td>2-3g q6-12h</td>
<td>HD: 2-3g q6-12h (post HD)</td>
</tr>
<tr>
<td><strong>Ciprofloxacin</strong></td>
<td>400mg q8-12h</td>
<td>400mg q8-12h</td>
<td>400mg q8-12h</td>
<td>400mg q8-12h</td>
<td>HD: 400mg q8-12h (post HD)</td>
</tr>
<tr>
<td><strong>Ciprofloxacin</strong> (Pseudomonal, critically ill)</td>
<td>400mg q8-12h</td>
<td>400mg q8-12h</td>
<td>400mg q8-12h</td>
<td>400mg q8-12h</td>
<td>HD: 400mg q8-12h (post HD)</td>
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<tr>
<td><strong>Ertaopenem</strong></td>
<td>1g q24h</td>
<td>1g q24h</td>
<td>1g q24h</td>
<td>1g q24h</td>
<td>HD: 1g q24h (post HD)</td>
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<tr>
<td><strong>Flucloxacillin</strong></td>
<td>1g q8-12h</td>
<td>1g q8-12h</td>
<td>1g q8-12h</td>
<td>1g q8-12h</td>
<td>HD: 1g q8-12h (post HD)</td>
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<tr>
<td><strong>Levofloxacin</strong></td>
<td>500mg q24h</td>
<td>250mg q24h</td>
<td>125mg q24h</td>
<td>125mg q24h</td>
<td>HD: 125mg q24h (post HD)</td>
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<tr>
<td><strong>Levofloxacin</strong> (Pseudomonal, skin, intrabdominal, pseudoe)</td>
<td>750mg q24h</td>
<td>750mg q24h</td>
<td>750mg q24h</td>
<td>750mg q24h</td>
<td>HD: 750mg q24h (post HD)</td>
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<tr>
<td><strong>Mecnopenem</strong></td>
<td>500mg q6-8h</td>
<td>500mg q6-8h</td>
<td>500mg q6-8h</td>
<td>500mg q6-8h</td>
<td>HD: 500mg q6-8h (post HD)</td>
</tr>
<tr>
<td><strong>Piperacillin-Tazobactam</strong> (Extended-infusion)</td>
<td>3.375g q8-12h</td>
<td>3.375g q8-12h</td>
<td>3.375g q8-12h</td>
<td>3.375g q12h</td>
<td>HD: 3.375g q12h (post HD)</td>
</tr>
<tr>
<td><strong>Teicoplanin</strong></td>
<td>5mg/kg q12h</td>
<td>5mg/kg q12h</td>
<td>5mg/kg q12h</td>
<td>5mg/kg q12h</td>
<td>HD: 5mg/kg q12h (post HD)</td>
</tr>
<tr>
<td><strong>TMP/SMX</strong> (Dose based on TMP, PCP treatment)</td>
<td>5mg/kg q6-8h</td>
<td>2.5mg/kg q6-8h</td>
<td>2.5mg/kg q6-8h</td>
<td>2.5mg/kg q6-8h</td>
<td>HD: 2.5mg/kg q6-8h</td>
</tr>
</tbody>
</table>

*For antimicrobials cleared every 24 hours in patients on hemodialysis, doses should be administered after dialysis on dialysis days. Alternatively, all doses may be administered once daily in the evening to ensure administration after dialysis on dialysis days.*
Examples Utilizing Health Systems – Scorecard

<table>
<thead>
<tr>
<th>AMH ASP FY2018</th>
<th>FY 2017 Q4</th>
<th>FY 2017</th>
<th>FY 2018 Q1</th>
<th>FY 2018 Q2</th>
<th>FY 2018 Q3</th>
<th>FY 2018 Q4</th>
<th>FY 2018</th>
<th>% Change FY2018 vs FY2017 Q4</th>
<th>% Change FY2018 vs FY2017 Q3</th>
<th>% Change FY2018 vs FY2017 Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMH</td>
<td>Apr-June 17</td>
<td>July 16 - June 17</td>
<td>July-Sep 17</td>
<td>Oct-Dec 17</td>
<td>Jan-Mar 18</td>
<td>Apr-June 18</td>
<td>July 17 - June 18</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Total Days of Therapy</strong></td>
<td>559.7</td>
<td>544.2</td>
<td>513.3</td>
<td>500.5</td>
<td>633.1</td>
<td>567.9</td>
<td>577.6</td>
<td>4.3%</td>
<td>1.5%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Numerator - Days of antibiotics</td>
<td>375</td>
<td>1,216</td>
<td>250</td>
<td>310</td>
<td>402</td>
<td>322</td>
<td>1,264</td>
<td></td>
<td></td>
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<tr>
<td>Denominator - 1,000 Days Present</td>
<td>670</td>
<td>2,236</td>
<td>487</td>
<td>534</td>
<td>635</td>
<td>567</td>
<td>2,223</td>
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<tr>
<td>Baseline</td>
<td>505</td>
<td>544</td>
<td>544</td>
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<tr>
<td><strong>Clostridium difficile rate (SIR)</strong></td>
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<td>Numerator - Number of Cases</td>
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<td>Denominator - 1,000 Days Present</td>
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<td><strong>Intervention Acceptance Rate</strong></td>
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<tr>
<td>Numerator - Accepted Venis</td>
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<td>Denominator - Total Actionable Venis</td>
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<td><strong>Specific Utilization</strong></td>
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<tr>
<td>Fluoroquinolones IV/PO</td>
<td>77.6</td>
<td>75.1</td>
<td>61.6</td>
<td>54.3</td>
<td>77.2</td>
<td>66.4</td>
<td>70.6</td>
<td>15.1%</td>
<td>11.3%</td>
<td>-5.9%</td>
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<tr>
<td>Numerator - Days of antibiotics</td>
<td>52</td>
<td>100</td>
<td>32</td>
<td>29</td>
<td>49</td>
<td>49</td>
<td>157</td>
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<tr>
<td>Denominator - 1,000 Days Present</td>
<td>670</td>
<td>2,236</td>
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<td>534</td>
<td>635</td>
<td>567</td>
<td>2,223</td>
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<tr>
<td>Baseline</td>
<td>98</td>
<td>75</td>
<td>75</td>
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<tr>
<td>β-Lactam + FQ</td>
<td>26.9</td>
<td>17.0</td>
<td>14.4</td>
<td>3.7</td>
<td>23.6</td>
<td>18.4</td>
<td>15.7</td>
<td>14.3%</td>
<td>-27.8%</td>
<td>-7.3%</td>
</tr>
<tr>
<td>Numerator - Days of antibiotics</td>
<td>18</td>
<td>36</td>
<td>7</td>
<td>2</td>
<td>15</td>
<td>11</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denominator - 1,000 Days Present</td>
<td>670</td>
<td>2,236</td>
<td>487</td>
<td>534</td>
<td>635</td>
<td>567</td>
<td>2,223</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>98</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
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<tr>
<td>Goal</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Piperacillin/Tazobactam</td>
<td>122.4</td>
<td>85.9</td>
<td>55.4</td>
<td>56.2</td>
<td>91.3</td>
<td>72.3</td>
<td>70.2</td>
<td>-18.7%</td>
<td>-40.9%</td>
<td>-21.1%</td>
</tr>
<tr>
<td>Numerator - Days of antibiotics</td>
<td>62</td>
<td>199</td>
<td>27</td>
<td>30</td>
<td>56</td>
<td>41</td>
<td>156</td>
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<tr>
<td>Denominator - 1,000 Days Present</td>
<td>670</td>
<td>2,236</td>
<td>487</td>
<td>534</td>
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<td>75</td>
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<tr>
<td>Goal</td>
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<tr>
<td>Ceftriaxone</td>
<td>10.4</td>
<td>15.2</td>
<td>24.6</td>
<td>16.0</td>
<td>16.3</td>
<td>10.8</td>
<td>16.6</td>
<td>-30.3%</td>
<td>1.3%</td>
<td>8.6%</td>
</tr>
<tr>
<td>Numerator - Days of antibiotics</td>
<td>7</td>
<td>34</td>
<td>6</td>
<td>11</td>
<td>8</td>
<td>37</td>
<td>8</td>
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<tr>
<td>Denominator - 1,000 Days Present</td>
<td>670</td>
<td>2,236</td>
<td>487</td>
<td>534</td>
<td>635</td>
<td>567</td>
<td>2,223</td>
<td></td>
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</tr>
</tbody>
</table>
Examples Utilizing Health Systems – Scorecard

**Total Abx DOT per 1,000 DP**

- **FY2017 Q4**: 550.0
- **FY2018 Q1**: 500.0
- **FY2018 Q2**: 600.0
- **FY2018 Q3**: 650.0
- **FY2018 Q4**: 550.0

- **Total Days of Therapy**
Examples Utilizing Health Systems – Scorecard

FQ DOT per 1,000 DP

FY 2017

AWH  AIR  AIW  AKH  ALH  AMH  AOH  ARH

FY 2018

AWH  AIR  AIW  AKH  ALH  AMH  AOH  ARH
Examples Utilizing Health Systems – Scorecard

Pip-tazo DOT per 1,000 DP

FY 2017

- AWH: 67.3
- AIR: 58.6
- AIW: 47.9
- AKH: 132.8
- ALH: 88.9
- AMH: 72.2
- AOH: 131.1
- ARH: 211.7

FY 2018

- AWH: 64.3
- AIR: 56.4
- AIW: 60.3
- AKH: 140.8
- ALH: 70.2
- AMH: 129.8
- AOH: 52.1
- ARH: 115.9
Our 2018 TJC Visit

CDC Core Element Utilization at AMHC

1. Leadership Commitment
   - Formal statement signed by senior leadership attesting support and commitment to antimicrobial stewardship at AMHC (appendix A).

2. Accountability
   - Dr. Keith Britulich, MD (AMHC hospital and clinic provider) and Coddee Peterson, PharmD, RPh (inpatient RPh) appointed co-chairs to AMHC Antimicrobial Stewardship Committee.
   - Dr. Troy Sennholz, MD (AMHC emergency department provider) sits on AMHC AMS committee.
   - Access to system ID resources including Dr. William Bower, MD, infectious disease specialist, who practices at Aspirus Wausau Hospital and co-chairs the Aspirus Antimicrobial Stewardship Subcommittee.
   - Additional AMHC AMS committee comprised of multidisciplinary team including quality director, frontline nursing staff, lab director, infection prevention RN.
   - All core members of the AMHC AMS committee are responsible for communicating information, initiatives, and antibiotic improvement efforts to their corresponding departments and colleagues.
   - Several members of the AMHC AMS committee also attend the Aspirus Wausau Antimicrobial Stewardship Subcommittee.

The AMHC antimicrobial stewardship committee has established and is responsible for the following outcomes for FY18:
   - 1% overall reduction in inpatient antibiotic use as measured by the Aspirus system scorecard (see “Tracking and Monitoring Antibiotic Prescribing, Use, and Resistance” for specific work).
   - Implementation of antibiotic time outs (see “Actions to Support Optimal Antibiotic Use” for specific work).
   - Staff education (see “Education of Clinicians and Patients and Families” for specific work).

3. Drug Experience
   - Coddee Peterson, PharmD completed the Society of Infectious Disease Pharmacists’ Antimicrobial Stewardship Certificate Program in October 2018. Past professional experience includes involvement in a health-system antimicrobial stewardship team as local site lead responsible for implementation of system initiative antimicrobial stewardship efforts.
   - Access and close collaboration with Tristan O’Driscoll, PharmD, MPH, BCPS, clinical pharmacy specialist—Infectious disease/antimicrobial stewardship currently leading Aspirus system efforts in antimicrobial stewardship. Tristan received his PharmD and MPH degrees concurrently from the University of Wisconsin-Madison. He completed his PGY1 pharmacy practice residency and PGY2 specialty practice residency in Infectious Diseases at Rush University Medical Center in Chicago, IL. He worked as an Antimicrobial Stewardship Pharmacist at Carinbras Medical Center in Charlotte, NC before coming to Aspirus to lead the Aspirus System Antimicrobial Stewardship Program.

4. Actions to Support Optimal Antibiotic Use
   - 2018-2020 Aspirus “Blue Card” outlining guidance in treatment recommendations, renal dosing, antibiotics and beta-lactam cross-reactivity table (allergy assessment) to guide appropriate antibiotic therapy (appendix B). This card is accessible on the Aspirus intranet and has been distributed to AMHC providers.
   - Inpatient CPOE standardized order sets in EPC have been updated and empiric medications available for ordering are based off of Aspirus Blue Card.
   - A six-hour antibiotic time out “Best Practice Alert (BPA)” will be implemented in the electronic health record for inpatient antibiotic therapy. After 12 hours of antibiotic therapy, a “pop-up” will alert the provider of current antibiotics and recent culture results. The provider will be asked to acknowledge the BPA and choose an action in order to proceed: “will de-escalate”, “discontinue”, or “will continue current orders”. The BPA will reappear again 72 hours later.
   - IV to PO policy is currently in place outlining criteria for IV to PO transition. Interventions recommended by pharmacists are being tracked for acceptance rates.
   - Renal dosing policy currently in place outlining procedures on when and how to adjust medications for renal dysfunction.
   - Policy and protocol in place for pharmacists to dose and order levels and labs for vancomycin upon consult. Consults are highly recommended and are routinely used.
   - Protocol in place for automatic change to extended infusion piperacillin/tazobactam by pharmacy.
   - System and local sepsis workflow formed to review sepsis guidelines, ordersets, and workflow.
   - Early (IM) patient engagement rounds occur by a multidisciplinary team including hospitalist, pharmacist, nurse, RT, PT/OT, discharge planner and the patient. Antibiotic therapy, goals and recommendations are discussed during patient engagement rounds. Pharmacy is able to suggest interventions based on culture and sensitivity data, clinical presentations, lab values, etc. at this time.
   - Culture and sensitivity data for inpatients are reviewed daily by pharmacist via utilization of a report sent daily with the prior day’s culture collections. In-house lab facilitates timely culture collection upon provider order.

In April 2018, Coddee Peterson and Tristan O’Driscoll will be participating in the Advocate health antimicrobial stewardship collaborative which will include representatives from the 6 Wisconsin health systems that make up this accountable
Our 2018 TJC Visit

• 2 MDs, 2 RNs
  – Stewardship discussed in leadership, IP, potential for MM
  – Surveyors were very complimentary towards our efforts thus far
• Just because the visit is over, don’t lose focus!
Getting Your Antimicrobial Stewardship Program Off the Ground in the Small and Rural Setting

Jonathan C. Cho, Pharm.D., M.B.A., BCPS
Clinical Assistant Professor
The University of Texas at Tyler
Practice Setting

- East Texas (Public Health Service Region 4/5N) is a region of approximately 1.5 million residents
- 29 out of 35 counties are classified as rural
- Four major health systems
- Two ID physician groups
- Two ID-trained pharmacists
- Two pharmacy residency programs
- 230-bed facility
- No clinical pharmacist

Texas Department of State Health Services. Counties and Regions. Available at: https://www.dshs.texas.gov/chs/info/info_txco.shtm.
Background

- 20-50% of antimicrobial use is inappropriate
  - 30% is considered unnecessary
- 1 out of 5 emergency department visits are for ADRs due to antibiotic use
- >$10 billion spent on antibiotics; >3.5$ billion among hospitalized patients
- >70% of all United States hospitals have <200 beds
  - ~10% have <25 beds → critical access hospitals
- Median hospital size = 160 beds
- Lack of antimicrobial stewardship (AS) and antibiotic use data in small community and rural settings

Antimicrobial usage rates differ between small and larger hospital.

a) Truth
b) Myth
Truth vs. Myth

Setting
• Utah; National Healthcare and Safety Network Reports from 2011-2013
• 15 small-community hospitals (SCHs) vs. 4 large-community hospitals (LCHs)

Results
• SCHs (median, 436 DOT/1000PD) vs. LCHs (509 DOT/1000PD)
• Broad-spectrum antibiotics accounted for 26% of use in SCHs and 32% in LCHs

Key Points
• Antibiotic usage rates did not differ between SCHs and LCHs
• Spectrum of antibiotics used did not differ between SCHs and LCHs

Estimates of Antibiotic Usage Trends

<table>
<thead>
<tr>
<th>Year</th>
<th>DOT/1000 PD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>660</td>
</tr>
<tr>
<td>2007</td>
<td>680</td>
</tr>
<tr>
<td>2008</td>
<td>700</td>
</tr>
<tr>
<td>2009</td>
<td>720</td>
</tr>
<tr>
<td>2010</td>
<td>740</td>
</tr>
<tr>
<td>2011</td>
<td>760</td>
</tr>
<tr>
<td>2012</td>
<td>780</td>
</tr>
</tbody>
</table>

Estimates of Antibiotic Usage Trends

Total Abx DOT per 1,000 PD

Axis Title

FY2017 Q4
FY2018 Q1
FY2018 Q2
FY2018 Q3
FY2018 Q4

AIR
ALH
ARH
AIW
AOH
AKH
System
AWH
AMH
# Antibiotic Usage

## Hospital Locations

- Medical unit
- Surgical unit
- Critical care unit
- Orthopedic ward
- Postpartum ward
- Specialty areas
- Neonatal units

## Common Antibiotics Used

- Vancomycin
- Ceftriaxone
- Levofloxacin
- Piperacillin-tazobactam
- Gentamicin
- Azithromycin
- Metronidazole

Antimicrobial resistance rates are lower in smaller hospitals.

a) Truth
b) Myth
Truth vs. Myth – Polling Slide

Smaller hospitals are less likely to have an active ASP.

a) Truth
b) Myth
Truth vs. Myth

7 Core Elements

Increase of hospital ASP practices from 40.9% to 48.1% in 2014-2015.

Small vs. Large

Hospitals with >200 beds were more likely to have an established ASP.

Conclusion

Comprehensive ASPs can be established in all facilities/sizes with leadership support.

What is the Problem?

Level of support from hospital administration
Availability of ID/ASP-trained personnel
Lack of involvement from other team members
Educational resources available to hospital staff
Lack of information technology resources
Need more AS data in small and rural settings!
# East Texas Data

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N=20 (%)</th>
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</thead>
<tbody>
<tr>
<td><strong>Institution setting</strong></td>
<td></td>
</tr>
<tr>
<td>Academic medical center</td>
<td>0</td>
</tr>
<tr>
<td>Community teaching hospital</td>
<td>5 (25)</td>
</tr>
<tr>
<td>Community non-teaching hospital</td>
<td>15 (75)</td>
</tr>
<tr>
<td><strong>Average daily census</strong></td>
<td></td>
</tr>
<tr>
<td>0-199</td>
<td>19 (95)</td>
</tr>
<tr>
<td>≥200</td>
<td>1 (5)</td>
</tr>
<tr>
<td><strong>Length of ASP program</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;6 months</td>
<td>8 (40)</td>
</tr>
<tr>
<td>6-11 months</td>
<td>4 (20)</td>
</tr>
<tr>
<td>≥1 years</td>
<td>8 (40)</td>
</tr>
</tbody>
</table>

Cho JC. *J Hosp Infect.* 2018;S18;30260-3.
ASP Team Members and Resource Allocation

- Physician: 0.9 (% of Hospitals), 0.2 (Avg. FTE)
- Pharmacist: 1 (% of Hospitals), 1 (Avg. FTE)
- Microbiologist: 0.5 (% of Hospitals), 0.4 (Avg. FTE)
- IT specialist: 0.15 (% of Hospitals), 0.6 (Avg. FTE)
- Infection control: 0.7 (% of Hospitals), 0.3 (Avg. FTE)
- Epidemiologist: 0 (% of Hospitals), 0 (Avg. FTE)
- Nurse w/ID training: 0.2 (% of Hospitals), 0.1 (Avg. FTE)

Cho JC. J Hosp Infect. 2018;S18;30260-3.
Formalized ID Training

**Physicians**
- 72% No ID Training
- 28% Formal ID Training

**Pharmacists**
- 95% No ID Training
- 5% Formal ID Training

Cho JC. *J Hosp Infect.* 2018;S18;30260-3.
### Available Support Documents

<table>
<thead>
<tr>
<th>ASP Characteristics</th>
<th>All Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASP Characteristics</strong></td>
<td>N=20 (%)</td>
</tr>
<tr>
<td>ASP committee involvement</td>
<td></td>
</tr>
<tr>
<td>Collaboration with infection control committee</td>
<td>14 (70)</td>
</tr>
<tr>
<td>Collaboration with pharmacy &amp; therapeutics committee</td>
<td>18 (90)</td>
</tr>
<tr>
<td>Written statement of support from hospital leadership</td>
<td>14 (70)</td>
</tr>
<tr>
<td><strong>Available support documents</strong></td>
<td></td>
</tr>
<tr>
<td>Leadership accountability documents</td>
<td>9 (45)</td>
</tr>
<tr>
<td>Budgeted financial support for ASP activities</td>
<td>5 (25)</td>
</tr>
<tr>
<td>Performance improvement plans</td>
<td>8 (40)</td>
</tr>
<tr>
<td>Strategic planning documents</td>
<td>7 (35)</td>
</tr>
<tr>
<td>Using electronic health record to collect ASP data</td>
<td>13 (65)</td>
</tr>
</tbody>
</table>

Cho JC. J Hosp Infect. 2018;S18;30260-3.
Stewardship Initiatives

- Guideline & Pathways
- ASP Activities
- Provide Education
- Dose Adjust. Protocol
- Tracking Outcomes

~35%
~65%
~30%
~20%

Cho JC. J Hosp Infect. 2018;S18;30260-3.
Strategies: Leadership and Financial Support

• ASP is not just a requirement!
• Need to understand why ASP is important:
  – Improves patient outcomes
  – Optimizes antimicrobial resources
  – Mitigates development of antimicrobial resistance
• Present ASP plans, activities, and goals
• Present ASP needs and wants with justification
  – Aid in establishing ASP budget
• Share ASP interventions and outcomes!
  – Written letter of support is not enough
January 4, 2018

To succeed, antimicrobial stewardship programs (ASP) need clear support from facility leadership. Asperus Medford Hospital’s leadership is committed in many ways, as the board, executive team, leadership and professional staff clearly support this commitment. We understand that dedicating necessary human, financial and information technology resources is a key part of demonstrating our organization’s commitment to effective stewardship.

The following statements below demonstrate leadership commitment at this organization:

- Antibiotic stewardship targets and goals have been established.
- Asperus System resources will be utilized for consultative services on an as needed basis.
- The importance of improving antibiotic use and IMMP/ACIP’s commitment to ASP is communicated to key stakeholders.
- Stories, speakers and other resources that highlight how ASP can improve patient outcomes are shared across the system.
- ASP activity is integrated into quality improvement and/or patient safety initiatives and is reported to the Pharmacy and Therapeutics Committee (P&T) and Medical Staff Committee.
- Ongoing provider education programs are provided and tracked.
- Access to and availability of microbiology data and laboratory resources for ASP efforts has been supported.
- Necessary support from other disciplines (quality improvement staff, laboratory staff, IT and nurses) and specifics of their responsibilities to support the ASP will be established.
- Efforts and policies/procedures/protocols to hold providers accountable for improving antibiotic use will be established.

[Signatures and dates]

Strategies: Leadership and Financial Support
Strategies: Financial Support

• AS grant funding opportunities
  – ASP development
    • Industry grants
  – Infectious diseases research
    • Infectious Diseases Society of America (IDSA)
    • Centers for Diseases Control and Prevention (CDC)
    • Society of Infectious Diseases Pharmacists (SIDP)
  – State/local AS initiatives
    • Texas Health and Human Services
  – Pharmacy practice advancement
    • ASHP Foundation
Strategies: Availability of ID-Trained Personnel

- **Ideal:** ASP co-led by ID trained physicians and pharmacists
- Recruit existing non-ID trained physicians and pharmacists
  - Should have protected time to perform AS-related activities
- Employ part-time ID physicians and pharmacists
- Utilize consultative ID/ASP networks

<table>
<thead>
<tr>
<th>Setting</th>
<th>Intervention</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| 155-bed community hospital | ASP led by non-ID trained pharmacist; other non-residency trained pharmacist contributed | • 74% intervention acceptance  
• ↓ 26% in ABX expenditure  
• $145,000+ direct savings  
• IV to PO conversion ↑ >600% |

Strategies: ASP Action

• Integrate other staff to ASP activities
  – Nurse practitioners/physician assistants: serve as antimicrobial stewards
  – Infection preventionists: optimize surgical prophylaxis
  – Microbiologists: facilitate timely pathogen results
  – Information technology personnel: assist with data collection
  – Nurses: provide education to patients
  – Pharmacy technicians: obtain patient medication records
  – Students, residents, fellows: assist in AS-related activities
Strategies: ASP Action

• Establish a health-system level ASP
  – Pool resources related to protocols and guidelines
• Utilize national and state collaborative efforts
• Initiate AS activities on a small number of units
• Limit AS activity days based on amount of resources available
  – 3x weekly
• Track and monitor antimicrobial prescribing and guideline compliance
  – Invest in information technology and clinical decision support systems
  – Use CDC National Healthcare Safety Network Antimicrobial Use and Resistance module
• Create an antimicrobial stewardship checklist
ASP Progress Report
ASP Progress Report

**Quarterly Summary**

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>2017Q4</th>
<th>Trend</th>
<th>%△</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CE1. Leadership support</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2) ASP charter</td>
<td></td>
<td>▲ 63%</td>
<td></td>
</tr>
<tr>
<td>3) Funding for AS activities</td>
<td></td>
<td>▲ 63%</td>
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<tr>
<td><strong>CE2. Accountability</strong></td>
<td></td>
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<tr>
<td>4) Physician leader</td>
<td></td>
<td>▲ 63%</td>
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<tr>
<td>5) Pharmacist leader</td>
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<td>▲ 60%</td>
<td></td>
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<tr>
<td><strong>CE3. Drug expertise</strong></td>
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<tr>
<td>6) Dedicated monthly AS meeting</td>
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<td>▲ 100%</td>
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<tr>
<td>7) Key support for the ASP</td>
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<td>▲ 57%</td>
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<tr>
<td><strong>CE4. Actions to support optimal antimicrobial use</strong></td>
<td></td>
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<tr>
<td>8-10) Policies</td>
<td></td>
<td>▲ 38%</td>
<td></td>
</tr>
<tr>
<td>11-13) Broad interventions</td>
<td></td>
<td>▲ 38%</td>
<td></td>
</tr>
<tr>
<td>14) Pharmacy driven interventions</td>
<td></td>
<td>▲ 54%</td>
<td></td>
</tr>
<tr>
<td>15) Diagnosis and infection specific interventions</td>
<td></td>
<td>▲ 0%</td>
<td></td>
</tr>
<tr>
<td><strong>CE5. Tracking AUR</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>16-18) Process measures</td>
<td></td>
<td>▲ 100%</td>
<td></td>
</tr>
<tr>
<td>19-21) Antibiotic use and outcome measures</td>
<td></td>
<td>▲ 23%</td>
<td></td>
</tr>
<tr>
<td>22) Facility antibiotic use with prescribers</td>
<td></td>
<td>▲ 63%</td>
<td></td>
</tr>
<tr>
<td><strong>CE6. Reporting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23) Antibiogram distributed to prescribers</td>
<td></td>
<td>▲ 100%</td>
<td></td>
</tr>
<tr>
<td>24) Antibiotic prescribing communications</td>
<td></td>
<td>▲ 20%</td>
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<tr>
<td><strong>CE7. Education</strong></td>
<td></td>
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<tr>
<td>25) Clinician and staff education</td>
<td></td>
<td>▲ 20%</td>
<td></td>
</tr>
<tr>
<td>26) Patient education</td>
<td></td>
<td>▲ 20%</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL SCORE** | 52% | ▲ 41% |

Legend: ▲ Change from baseline
Strategies: Utilization of Telehealth

• Telehealth resources
  – Advantages:
    • Allows access to ID-trained personnel
    • More convenient?
    • Potential cost savings
  – Disadvantages:
    • Technical training
    • Less frequent consultations
    • Regulations vary by state
    • Limited physical examination
## Strategies: Utilization of Telehealth

<table>
<thead>
<tr>
<th>Setting</th>
<th>Intervention</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| Two rural VA medical centers | Telecommunications via videoconference; weekly discussion of ID cases and AS-related education | • Sites A and B discussed 3.5 and 3.1 cases weekly  
• 73% vs. 65% acceptance rate |
| 220-bed Brazil           | Performed antimicrobial stewardship through telemedicine                      | • ↑ 51.4% appropriate ABX  
• ↓ consumption broad-spectrum ABXs (FQs, vanc) |
| Pediatric hospital Italy | ABX consultation per patient; biweekly discussion of cases                   | • ↓ MDRO isolation  
• ↓ ABX cost & packages/doses |

Dos Santos RP. *J Telemed Telecare.* 2018;doi: 10.1177/1357633X18767702. [Epub ahead of print]  
Strategies: Education

• Teaching hospital prescribers and staff
  – Continuing education presentations
  – Patient care rounds
• Written or e-mailed notification
  – Poster reminders
  – Institutional newsletter
  – AS annual competency
• Protocol and guideline development
  – Anti biograms
  – Treatment pathways
• Educate while making antibiotic recommendations
Resources for ASP Education

Materials and Forms

Contributed by Allina Regional Hospital Cardinal Health Pharmacy Solutions, Columbia University Medical Center, Intermountain Healthcare, the Johns Hopkins Hospital, and other members of SHEA’s Antimicrobial Stewardship Task Force

- Tools for Daily Activities of Stewardship:
  - Emergency Department and Urgent Care Stewardship Toolkit
  - Peri-Operative Antibiotic Prophylaxis Blank Protocol (16 KB)
  - Adult Inpatient Antibiotic Approval Form, PDF (19 KB)
  - Antibiotic Recommendation Form, PDF (20 KB)
  - Blank Order Set for Antifungal Therapy, PDF (21 KB)
  - Antibiotic Stewardship 360: Optimizing Outcomes Toolkit

- Policies, Procedures, and Guidelines:
  - State Strategies to Address Antimicrobial Resistance – Survey Results (ASTHO), PDF (538 KB)
  - Sample Daily Pharmacist Checklist, PDF (268 KB)
  - Drug Use Evaluation Form, PDF (99 KB)
  - IV to PO Guidelines, PDF (380 KB)
  - IV to PO Worksheet, PDF (24 KB)
  - Justification and Protocol for Extended-Infusion Piperacillin/Tazobactam in Adult Patients, PDF (240 KB)
  - Antibiotic Streamlining – Sample Pharmacist’s Daily Routine, PDF (76 KB)

- Business Case, Request for Proposal, and Job Description Examples:
  - Building a Business Case for ASP Presentation, PDF (982 KB)
  - Antimicrobial Stewardship Program Proposal Sample 1, PDF (112 KB)
  - Cost Analysis, PDF (14 KB)
  - Antimicrobial Stewardship Program Proposal Sample 2, PDF (36 KB)
  - RFP for ID Consultation and Post Prescription Antibiotic Rounding, Allina Regional Hospital, 2008, PDF (104 KB)
  - Minnesota Guide to a Comprehensive Antimicrobial Stewardship Program, PDF (221 KB)

Join the "Stewardship" Listserv to connect with other experts in the field!

Resources for ASP Education

- Stewardship certificates programs (online/live courses)
  - Making a difference in infectious diseases (MAD-ID)
  - Society of Infectious Diseases Pharmacists (SIDP)
- ASP books, literature & guidelines
- Continuing education programs
  - CDC 4-part series (8 CEs)
- Institutional AS websites
  - Cleveland Clinic
  - Johns Hopkins
  - Nebraska Medicine
- Additional resources
  - Antibiotic dose calculator
  - Antibiotic spectrum tables
KEY TAKEAWAYS

1) KEY TAKEAWAY
Antimicrobial stewardship programs are needed in all practice settings, including small and rural hospitals, to mitigate the development of antimicrobial resistance.

2) KEY TAKEAWAY
Engaging administrators in the antimicrobial stewardship program’s planning, goals, and activities can help obtain resources needed to optimize antimicrobial use.

3) KEY TAKEAWAY
Development of a successful antimicrobial stewardship program takes the engagement of a multidisciplinary team to develop attainable goals based on the resources available.
Self Assessment Question 1 – Polling Slide

Which of the following is NOT an element of performance listed under The Joint Commission’s antimicrobial stewardship standard (MM.09.01.01)?

a) Organizational leaders establish antimicrobial stewardship as a priority
b) Education is provided to staff regarding antimicrobial stewardship
c) The antimicrobial stewardship program identifies a list of restricted antibiotics
d) An antimicrobial stewardship program is to involve a multidisciplinary team
Self Assessment Question 2 – Polling Slide

Which of the following is a tool that can be used to educate staff on antimicrobial stewardship?

a) Annual computer based training modules required by all staff
b) In person training during new hire orientation
c) News capsules or newsletters
d) All of the above
Which of the following strategies can help overcome barriers of antimicrobial stewardship programs in the small and rural setting?

a) Consultation services
b) Telehealth
c) Information technology
d) All of the above
Questions, Answers, and Discussion

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