What is the Current State of Hospital Antibiotic Stewardship?

Findings from the Advisory Board’s Survey of Antibiotic Stewardship Programs

Antibiotic resistance has emerged as a major imperative for the United States, linked to an estimated two million infections annually. In response to such concerns—as well as pressure from federal agencies—many hospitals are stepping up their efforts to better manage antibiotic use. Yet hospitals often lack the resources to implement every stewardship strategy recommended by experts. This survey explores trends in hospital-based antibiotic stewardship programs (ASPs) and identifies what stewardship challenges still remain.

A Relatively Recent Development
Nearly 70% of programs have existed for five years or less, including 35% that launched within the last two years

Less Common at Smaller Hospitals
Among hospitals with more than 300 beds, 89% report having an ASP, compared with 73% of smaller hospitals

Hospitals are Investing in ASPs…

Percent of responding hospitals that have an ASP in place (n = 415)

81%

…but Lack of Resources (Especially Staff) Remains a Challenge

Top Five Challenges to Implementing an ASP
Percent of Hospitals Citing Challenge

50% Lack of staff resources to identify or implement stewardship interventions
37% Lack of data to measure ASP opportunity or impact
35% Lack of physician champion support
32% Resistance from frontline physicians
28% Lack of pharmacist support

Large and small hospitals reported struggling equally with lack of staff resources, though small hospitals say they struggle with physician leadership more often than bigger facilities do (40% vs. 28%, respectively)

Antibiotic Stewardship Survey in Brief

- Sent to hospitals and health system members of three Advisory Board quality-focused programs (Crimson Continuum of Care, Quality Compass, and Physician Executive Council), as well as a subset of hospital pharmacy leaders; conducted in fall 2015
- Includes responses from 418 unique organizations, split almost evenly between large facilities (more than 300 beds; 48.6% of respondents) and small facilities (less than 300 beds; 51.4% of respondents)
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Despite Leadership Challenges, Most ASPs Have Some Physician Oversight

Which Best Describes the Leadership of Your ASP? (N = 312 hospitals)

- 52.5% Co-led by physician and pharmacist
- 23% Led by physician champion
- 21.5% Led by pharmacist
- 3% Led by someone else or no dedicated leader

Are Infectious Disease (ID) Physicians Regularly Involved in Stewardship Oversight? (N = 308 hospitals)

- 68% Yes—provider at local hospital level
- 18% Yes—provider shared across hospitals in system
- 10% Yes—provider outside system (e.g., external consultant or telehealth)
- 10% No, not formally involved in oversight

Additional ASP Leadership Findings

- 76% Hospitals that support ASP leaders with a multidisciplinary steering committee

Most Common ASP Committee Members (Besides ID Physicians)

- 99% Pharmacy leaders or staff
- 82% Infection control staff
- 73% Clinical microbiologist
- 65% Quality leaders or staff
- 58% Nursing representative
- 55% Other physician

ASP Interventions Primarily Focus on Formulary, Protocols, Pharmacy Review

Most Common ASP Interventions (Percent of hospitals using intervention; n = 283)

- 92% Process to review new antibiotics before adding to formulary
- 83% Creation of antibiotic treatment guidelines
- 80% Protocol for dose adjustment based on organ dysfunction
- 80% Regular pharmacy review of “drug/bug” mismatches
- 74% Regular pharmacy review of potential drug interactions
- 74% Protocol for switching from IV to oral drug therapy
- 72% Prior authorization (restricting certain drugs)
- 68% Prospective audit and feedback
- 61% Provider education through department or group meetings

1) Real-time review of antimicrobial therapy conducted by someone other than prescribing provider, with recommendations then given to treating provider
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### Interventions that Involve Frontline Physicians Less Common

#### Interventions Used by Fewer Than Half of Respondents (Percent of hospitals using intervention; n = 283)

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Protocol for antibiotic documentation</td>
<td>49%</td>
</tr>
<tr>
<td>Provider education via technology (e.g., pop-up windows)</td>
<td>46%</td>
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<tr>
<td>Provider education via retrospective review of prescribing data</td>
<td>42%</td>
</tr>
<tr>
<td>Automatic stop orders for specified antibiotics</td>
<td>39%</td>
</tr>
<tr>
<td>Antibiotic &quot;time-outs&quot;</td>
<td>36%</td>
</tr>
<tr>
<td>Antibiotic cycling (rotating between similar drugs)</td>
<td>7%</td>
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</tbody>
</table>

Dark-shaded bars represent interventions that may require more work for individual frontline physicians, indicating potential ASP preference to first build infrastructure around physicians instead.

### In Targeting Specific Drugs, Focus is on Broad-Spectrum, ‘Last Resort’ Options

#### Percent of Hospitals Specifically Targeting Antimicrobial Type (N = 278)

<table>
<thead>
<tr>
<th>Antimicrobial Type</th>
<th>Percent</th>
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</thead>
<tbody>
<tr>
<td>Carbapenems (doripenem, imipenem, ertapenem, meropenem)</td>
<td>78%</td>
</tr>
<tr>
<td>Lipopeptides / daptomycin</td>
<td>64%</td>
</tr>
<tr>
<td>Oxazolidinones/linezolid</td>
<td>54%</td>
</tr>
<tr>
<td>Fluoroquinolones</td>
<td>51%</td>
</tr>
<tr>
<td>Glycopeptides / vancomycin</td>
<td>48%</td>
</tr>
<tr>
<td>Antifungals</td>
<td>46%</td>
</tr>
<tr>
<td>Piperacillin-tazobactam</td>
<td>43%</td>
</tr>
<tr>
<td>Cephalosporins (3rd-gen)</td>
<td>28%</td>
</tr>
<tr>
<td>Monobactams / aztreonam</td>
<td>25%</td>
</tr>
<tr>
<td>Cephalosporins (2nd-gen)</td>
<td>13%</td>
</tr>
<tr>
<td>Lincosamides / clindamycin</td>
<td>12%</td>
</tr>
<tr>
<td>Macrolides</td>
<td>10%</td>
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</tbody>
</table>

2) Antibiotics started empirically but formally reviewed by prescribing provider or treatment team after diagnostic information becomes available.

Useful against bacteria resistant to other drugs

Broad-spectrum antibiotics that can be used against a range of pathogens
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Pathogens Considered Urgent Threats Also in the Cross Hairs

Percent of Hospitals Specifically Targeting Pathogen \((N = 277)\)

- Clostridium difficile: 76%
- Staphylococcus aureus/MRSA: 61%
- Enterobacteriaceae\(^3\): 43%
- Enterococci/VRE/E. faecium: 42%
- Pseudomonas aeruginosa: 36%
- Acinetobacter/A. baumanii: 24%
- Burkholderia cepacia: 4%

Most ASPs Monitoring Only a Limited Number of Outcome Metrics

Percent of Hospitals Monitoring Metric Type by Tracking Methodology

- Bacterial sensitivity: 51% tracked electronically, 44% tracked by hand
- Antimicrobial spending: 50% tracked electronically, 39% tracked by hand
- Antimicrobial utilization: 46% tracked electronically, 35% tracked by hand
- Rates of resistant infections: 49% tracked electronically, 37% tracked by hand
- Utilization by provider: 22% tracked electronically, 21% tracked by hand
- Overall savings due to stewardship: 20% tracked electronically, 15% tracked by hand
- Antimicrobial appropriateness: 13% tracked electronically, 9% tracked by hand
- Adherence to ASP protocols: 9% tracked electronically, 9% tracked by hand
- Impact of ASP on clinical outcomes: 9% tracked electronically, 9% tracked by hand
- Physician compliance with treatment recommendations: 45% tracked electronically, 25% tracked by hand

Anecdotally, many ASPs report that they lack the data or analytical resources to track much more than drug utilization, drug spending, and bacterial trends.

\(^3\) E. coli, Klebsiella, extended-spectrum b-lactamase-producing organisms.