



Antimicrobial Stewardship:

Arizona Partnerships Working to Improve the Use of Antimicrobials in the Hospital and Community

Part 12

“Antibacterials – indeed, anti-infectives as a whole – are unique in that misuse of these agents can have a negative effect on society at large. Misuse of antibacterials has led to the development of bacterial resistance, whereas misuse of a cardiovascular drug harms only the one patient, not causing a societal consequence.”

- Glenn Tillotson; Clin Infect Dis. 2010;51:752

“...we hold closely the principles that antibiotics are a gift to us from prior generations and that we have a moral obligation to ensure that this global treasure is available for our children and future generations.”

- David Gilbert, et al (and the Infectious Diseases Society of America). Clin Infect Dis. 2010;51:754-5

A Note To Our Readers and Slide Presenters

The objectives of the Subcommittee on Antimicrobial Stewardship Programs are directed at education, presentation, and identification of resources for clinicians to create toolkits of strategies that will assist clinicians with understanding, implementing, measuring, and maintaining antimicrobial stewardship programs.

The slide compendium was developed by the Subcommittee on Antimicrobial Stewardship Programs (ASP) of the Arizona Healthcare-Associated Infection (HAI) Advisory Committee in 2012-2013.

ASP is a multidisciplinary committee representing various healthcare disciplines working to define and provide guidance for establishing and maintaining an antimicrobial stewardship programs within acute care and long-term care institutions and in the community.

Their work was guided by the best available evidence at the time although the subject matter encompassed thousands of references. Accordingly, the Subcommittee selectively used examples from the published literature to provide guidance and evidenced-based criteria regarding antimicrobial stewardship. The slide compendium reflects consensus on criteria which the HAI Advisory Committee deems to represent prudent practice.

Disclaimers

All scientific and technical material included in the slide compendium applied rigorous scientific standards and peer review by the Subcommittee on Antimicrobial Stewardship Programs to ensure the accuracy and reliability of the data. The Subcommittee reviewed hundreds of published studies for the purposes of defining antimicrobial stewardship for Arizonan clinicians. The Arizona Department of Health Services (ADHS) and members of its subcommittees assume no responsibility for the opinions and interpretations of the data from published studies selected for inclusion in the slide compendium.

ADHS routinely seeks the input of highly qualified peer reviewers on the propriety, accuracy, completeness, and quality (including objectivity, utility, and integrity) of its materials. Although the specific application of peer review throughout the scientific process may vary, the overall goal is to obtain an objective evaluation of scientific information from its fellow scientists, consultants, and Committees.

Please credit ADHS for development of its slides and other tools. Please provide a link to the ADHS website when these material are used.

Introduction to Slide Section

Reasons to Optimize Antibiotic Use

Pathways to a Successful ASP

Antimicrobial Stewardship: Making the Case

ASPs: Nuts & Bolts

Antimicrobial Stewardship: Measuring Antibiotic Utilization

Antimicrobial Stewardship: Daily Activities

Antimicrobial Stewardship: Computerized & Clinical Decision Support Services

Microbiology: Cumulative Antibigram & Rapid Diagnostics

Antimicrobial Stewardship Projects: Initiation & Advanced

Antimicrobial Stewardship Barriers & Challenges: Structural & Functional

Antibiotic Use in the Community

Opportunities to Justify Continuing the ASP

Antimicrobial Stewardship: Perspectives to Consider

Summary

- **Preface:**

Administrators provide support for the ASP, but they request outcomes data in return. Length of stay can be an important marker for the success of the ASP as well as reduction in the antimicrobial costs of the pharmacy budget. On the other side there is the cost of dismantling the ASP as the example provided disproved the wisdom of such action.

- **Content:**

5 slides with 3 additional slides.

- **Suggestions for Presentation:**

Self-learning slide module to provide ideas about surviving the ASP venture. These slides follow part 3 – “Making the Case”.

- **Comments:**

The additional slides present the data from the article by Standiford et al in another light. But it is essential reading and this has likely been repeated many times yet outcomes never published. A final idea might be to adjust annual cost-saving to the increase in inflation. An ASP which has reached a plateau in real dollar savings for that budget period has actually saved expenses through a 3% inflation rate over several years.

ANTIMICROBIAL STEWARDSHIP
BARRIERS AND CHALLENGES:
**OPPORTUNITIES TO JUSTIFY
CONTINUING THE ASP**

Antibiotic Stewardship Can Decrease LOS

- Oklahoma City VA¹
 - ID pharmacist
 - Mean hospital LOS decreased from 13.3 days to 10.8 days ($P < 0.01$)
- Pittsburgh VA²
 - Critical care unit, ID physicians and intensivists
 - Algorithm development
 - Mean ICU LOS 9 days vs 15 days ($P = 0.04$)
- Six hospitals across the UK³
 - Evaluation audit tool assessed all patients on antibiotic treatments on acute care wards
 - Early discontinuation, conversion from IV-to-PO, and placement of selected patients in an outpatient parenteral antibiotic therapy program saved 481 inpatient bed-days amongst 1,356 patients reviewed

1 Gentry C et al. Am J Health-Syst Pharm. 2000;57:268-74.

2 Singh N et al. Am J Resp Crit Care Med. 2000;162:505-11.

3 Dryden M et al. J Antimicrob Chemother. 2012;67(9):2289-96.

The Cost of Discontinuing an ASP

- ASP was implemented at the Univ Maryland Med Cntr (July 2001); continued for 7 years
- The ASP was terminated; the resources were used to increase ID consults (ASP was considered heavily resourced)
- Utilization costs decreased from \$44,181 per 1,000 patient-days at baseline (prior to FY 2001) to \$23,933 (a 45.8% decrease) by the end of the program (FY 2008)
- There was a reduction of ~\$3 million within the first 3 years
- After the program was discontinued at the end of FY 2008, antimicrobial costs increased from \$23,933 to \$31,653 per 1,000 patient-days, a 32.3% increase within 2 years

Increase in Costs of 5 Selected Antimicrobials One Year Following Discontinuation of an ASP

Antimicrobial	FY 2008 (\$)	FY 2009 (\$)	Change
Piperacillin/tazobactam	877,809	1,339,270	+ 53%
Linezolid	343,725	499,845	+ 45%
Daptomycin	102,944	254,294	+ 147%
Carbapenems	405,181	548,737	+ 35%
Tigecycline	187,305	274,554	+ 47%
TOTAL (of above)	1,916,964	2,642,146	+ 52%

Discontinuation of an ASP resulted in increased antimicrobial costs of 32.3%, or \$2 million, over 2 years

Key Points in Overcoming Barriers and Challenges: Anticipate Challenges, Be Persistent, Incentivize Team

- ASP start-up does not require significant financial resources – only time and motivation
- Acceptance requires use of objective data to develop interventions with stakeholders
- Leave nothing to chance: Think through components of a potential intervention to maximize success
- Organize a multi-disciplinary team – Engage respected members of the institution and hospital leadership early
- Engage a large number of target providers
 - Use peer champions to disseminate and deliver messages to colleagues
 - Use real-time cases to promote guideline utilization
 - Start with face-to-face meetings
- Audit and provide feedback of ASP metrics to drive change in provider behavior
- Automation – use IT when possible but interventions do not need to be IT-driven to be successful
- Be willing to compromise
- Stay focused on goals; overly broad interventions may fail

ADDITIONAL SLIDES

Discontinuation of the Antibiotic Stewardship Program: Hard Lessons

- An antimicrobial stewardship program was fully implemented at the University of Maryland Medical Center in July 2001 (beginning of fiscal year [FY] 2002)
 - Antimicrobial monitoring team (AMT) = an infectious diseases–trained clinical pharmacist and a part-time infectious diseases physician
 - AMT provided real-time monitoring of antimicrobial orders and active intervention and education when necessary
- Outcomes of the 7 year program:
 - Utilization costs decreased from \$44,181 per 1,000 patient-days at baseline prior to the full implementation of the program (FY 2001) to \$23,933 (a 45.8% decrease) by the end of the program (FY 2008)
 - There was a reduction of approximately \$3 million within the first 3 years, much of which was the result of a decrease in the use of antifungal agents in the cancer center

Discontinuation of the Antibiotic Stewardship Program: Hard Lessons (cont'd)

- The AMT was terminated in order to use the resources to increase infectious diseases consults throughout the medical center as an alternative mode of stewardship
- After the program was discontinued at the end of FY 2008, antimicrobial costs increased from \$23,933 to \$31,653 per 1,000 patient-days, a 32.3% increase within 2 years that is equivalent to a \$2 million increase for the medical center

The Cost of Discontinuing an ASP

- After the program was discontinued at the end of FY 2008, antimicrobial costs increased from \$23,933 to \$31,653 per 1,000 patient-days
- These increased antibiotic utilization costs were observed for a variety of drug classes
- Discontinuation of the ASP at the University of Maryland Medical Center resulted in increased antimicrobial costs of 32.3%, or \$2 million, over 2 years

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