



A National Action Plan To Combat Antibiotic Resistance: Are You Prepared?



Health and Wellness for all Arizonans

Introductions & Disclosures

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Educational Objectives and Agenda

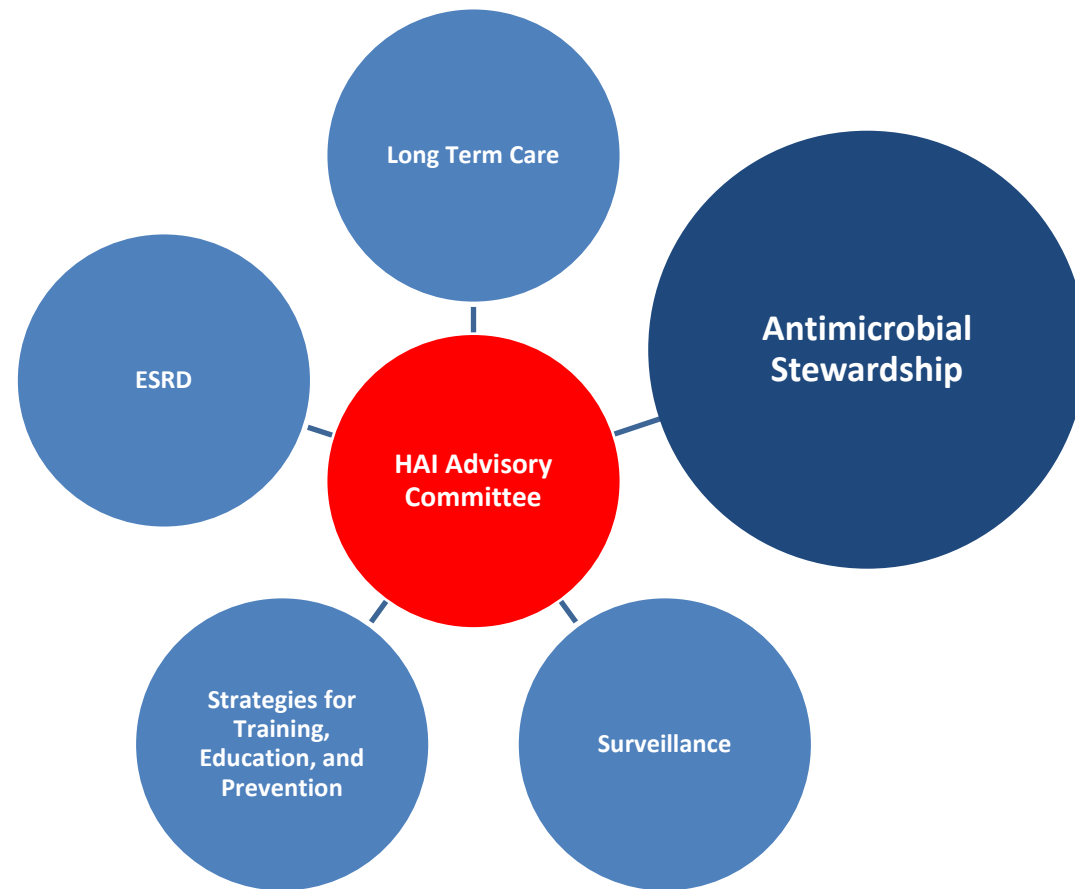
- Understand global initiatives to improve the use of antibiotics, including programs in the United States
- Review the major elements of the Government's plan to combat antibiotic resistance
- Discuss antimicrobial stewardship metrics in both acute care hospitals and long-term care settings
- Be able to discuss with hospital leadership the national action plans by the CDC, TJC, and other groups which mandate antimicrobial stewardship programs in the U.S. as a performance measure
- Become familiar with currently available resources in the state of Arizona to assist in preparing a hospital structure to support stewardship
- Learn how to achieve hospital leadership support, medical staff skill sets, and documentation for CMS audit

ADHS HAI Program

- Facilitate the HAI Advisory Committee and its corresponding subcommittees as they identify and support HAI prevention priorities for the state
- Coordinate intra-agency HAI prevention activities
- Monitor and expand current HAI surveillance activities
- Build and participate in partnerships and collaborations to assist HAI efforts throughout the state



HAI Advisory Committee and Subcommittees



www.preventHAaz.gov

HAI Program Priorities for 2015-2016

- **Antimicrobial stewardship, use, and resistance**
- Drug diversion
- Healthcare worker vaccination
- Infection prevention
- Injection safety
- Pharmacy and compounding

Antimicrobial Stewardship Subcommittee

- Comprised of a group of ID physicians, ID pharmacists, microbiology laboratory, academic, public health, and nursing professionals
- Provides information, best practices for stewardship, and technical assistance to healthcare facilities and providers
- What resources are currently available?
 - Antimicrobial Stewardship Program (ASP) slide set
 - MDRO fact sheet
 - Antibigram toolkit
 - Business models and tools
 - FAQs and “Contact Us” resource for ASP issues
 - Antibiotic use information for general public
 - 2015 Antimicrobial Stewardship Program (ASP) Survey
 - Empiric and pathogen-directed Antimicrobial Therapies Guidance
 - Understanding the Antibigram in the Long-Term Care Setting

And more...

<http://www.azdhs.gov/preparedness/epidemiology-disease-control/healthcare-associated-infection/advisory-committee/index.php#antimicrobial-stewardship>



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Carbapenem resistant Enterobacteriaceae (CRE)

- Bureau of State Laboratory Services
 - Isolates suspected of being non susceptible to Carbapenem(s) for verification/confirmation of CRE
 - Carbapenemase activity of an organism is determined by using Modified Hodge Test (MHT)
 - MHT positive isolates are then tested by PCR to determine if the Carbapenemase activity is caused by either the presence of the Klebsiella pneumonia Carbapenemase gene, bla KPC or the new Delhi metallo β -lactamase gene (blaNDM-1)
 - In addition, the minimum inhibitory concentration (MIC) along with the interpretation will be determined by Carbapenem Etests for all isolates
- Office of Infectious Disease Services
 - Is currently analyzing the CRE data obtained from previous years to determine the impact of CRE and show the importance of CRE surveillance and interventions
 - Is also exploring the possibility of making CRE a laboratory-reportable disease in Arizona

Epidemiology and Laboratory Capacity (ELC) Grant

- Add senior level expertise in AR and data for action activities
- Facilitate Antimicrobial Stewardship Subcommittee
- Encourage facilities to enroll in a stewardship collaboratives, trainings, and connect to current resources
- Develop antimicrobial stewardship collaborative training
- Distribution of antimicrobial stewardship education and training materials
- Attendance at CDC-sponsored HAI/AR training
- Promote the use of National Healthcare Safety Network (NHSN) Antibiotic Use and Resistance (AU/AR) modules among facilities

Arizona's Infection Prevention Assessment Survey Acute Care Hospitals (ACHs) & Long-Term Care Facilities (LTCFs)

Section 1: Facility Demographics

Section 2: Facility monitoring, surveillance and reporting

Section 3: Laboratory monitoring, reporting, and surveillance

Section 4: Current Infection Control Resources

Section 5: Infection Control Program and Infrastructure

Section 6: Infection Control Training, Competency, and Implementation of Policies and Procedures

— E. Antibiotic Stewardship Programs (ASPs)



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Hospital Responses and EMS Regions



Demographics of EMS Regions

Demographics	Central	Northern	Southeastern	Western	Total
Total # of Hospitals	41	10	11	6	68
Acute Care Hospitals	38	5	7	4	54
Critical Access Hospitals	3*	5*	4	2	14
Median Bedsize (Mean)	188 (207)	40 (67)	100 (123)	140 (160)	123 (169)
Median #Beds/IP (Mean)	138 (133)	29 (47)	83 (96)	140 (127)	109 (114)
# of Hospitals with Primary IP with CIC status (Percent)**	26 (67%)	2 (20%)	5 (50%)	3 (50%)	36 (55%)

* ASP Data missing from 2 hospitals (1 each in central and northern regions)

** Missing CIC data from 3 Hospitals (2 in central region and 1 in southeastern region)

7 Core Elements of ASP

1. Leadership Commitment
2. Accountability
3. Drug Expertise
4. Actions to support optimal antibiotic use
5. Tracking
6. Reporting
7. Education

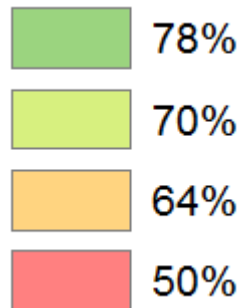
#1 – Leadership Commitment



*Answered 'Yes' to at least 1 of the following questions:

- Hospital has a written statement of support from leadership that supports efforts to improve antibiotic use
- Hospital provides salary support for dedicated time for antibiotic stewardship activities

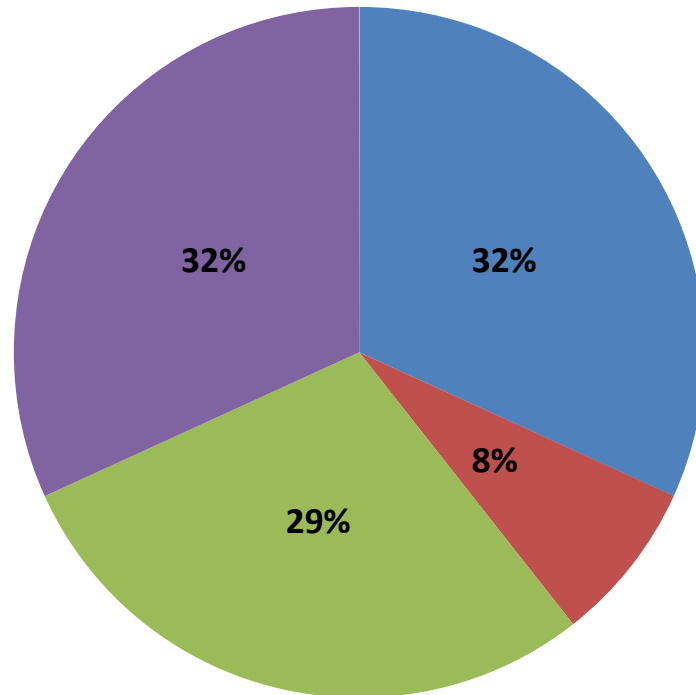
Arizona – 68%



#1 - Leadership Commitment

Leadership Commitment

- Hospital has a written statement of support from leadership that supports efforts to improve antibiotic use
- Hospital provides salary support for dedicated time for antibiotic stewardship activities
- Hospital does both
- Hospital does neither



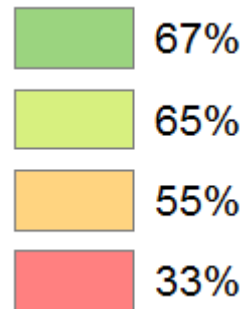
#2 – Accountability



*Answered 'Yes' to the following question:

- There is a leader responsible for outcomes of stewardship activities at the hospital.

Arizona – 61%



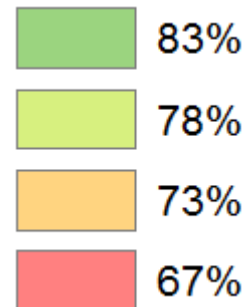
#3– Drug Expertise



* Answered 'Yes' to the following question:

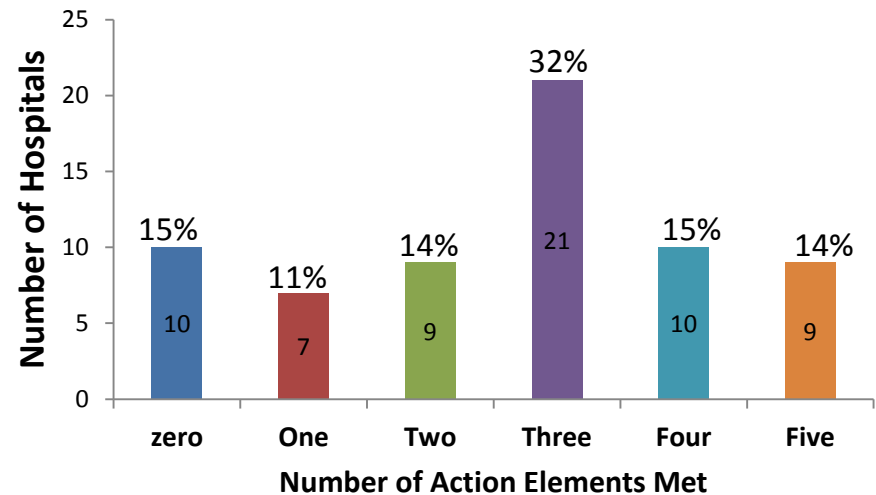
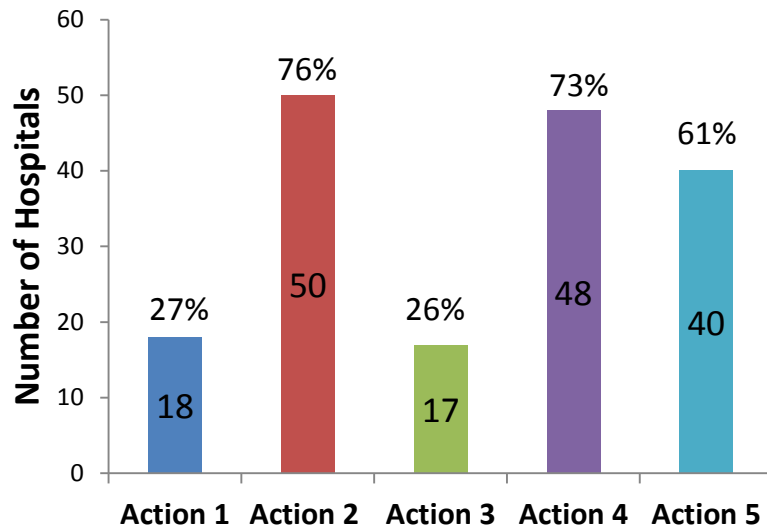
- There is at least one pharmacist responsible for improving antibiotic use at the hospital

Arizona – 79%



#4– Actions to Support Optimal Antibiotic Use

1. Hospital has a policy that requires prescribers to document an indication for all antibiotics in the medical record or during order entry
2. Hospital has hospital-specific treatment recommendations, based on national guidelines and local susceptibility, to assist with antibiotic selection for common clinical conditions
3. There is a formal procedure for all clinicians to review the appropriateness of all antibiotics at or after 48 hours from the initial order (e.g., antibiotic time out)
4. Hospital has specified antibiotic agents that need to be approved by a physician or pharmacist prior to dispensing at the hospital
5. Physician or pharmacist reviews courses of therapy for specified antibiotic agents and communicates results with prescribers

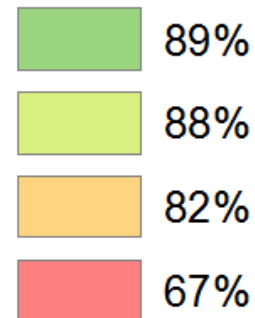


#4– Action to Support Optimal Antibiotic Use



*Answered 'Yes' to at least 1 of the actions:

Arizona – 85%



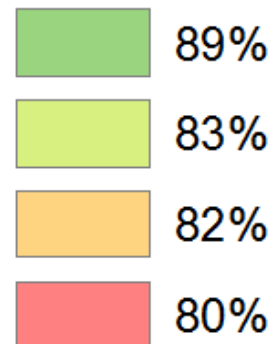
#5– Tracking



* Answered 'Yes' to the following question:

- Hospital monitors antibiotic use (consumption)

Arizona – 82%

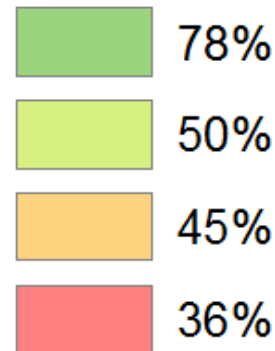


#6– Reporting



- * Answered 'Yes' to the following question:
 - Prescribers receive feedback by the stewardship program about how they can improve their antibiotic prescribing

Arizona – 48%

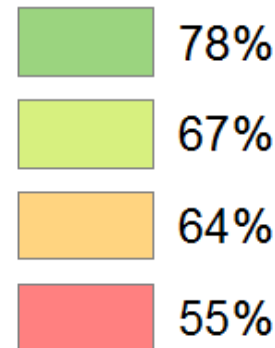


#7– Education



- * Answered 'Yes' to the following question:
 - Stewardship program provides education to clinicians and other relevant staff on improving antibiotic use

Arizona – 61%



Summary of Core Elements

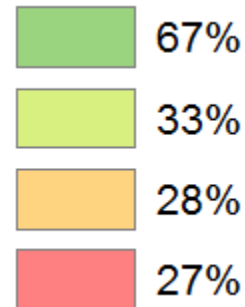
Core Element	Arizona	Central	Northern	Southeastern	Western
1. Leadership Commitment	68% 	70%	78%	64%	50%
2. Accountability	61% 	65%	67%	55%	33%
3. Drug Expertise	79% 	83%	78%	73%	67%
4. Action	85% 	88%	89%	82%	67%
5. Tracking	82% 	80%	89%	82%	83%
6. Reporting	48% 	45%	78%	36%	50%
7. Education	61% 	55%	78%	64%	67%

Hospitals Meeting All 7 Core Elements by EMS Region



Percent Meeting All 7 Core Elements

Arizona – 33%

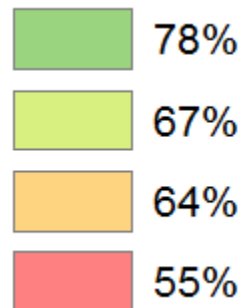


Hospitals Meeting 5 or More Core Elements by EMS Region



Percent Meeting 5 or more Core Elements

Arizona – 61%

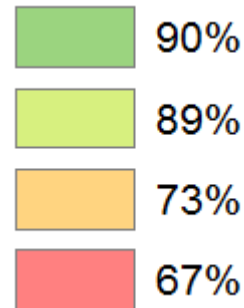


Hospitals Meeting 3 or More Core Elements by EMS Region

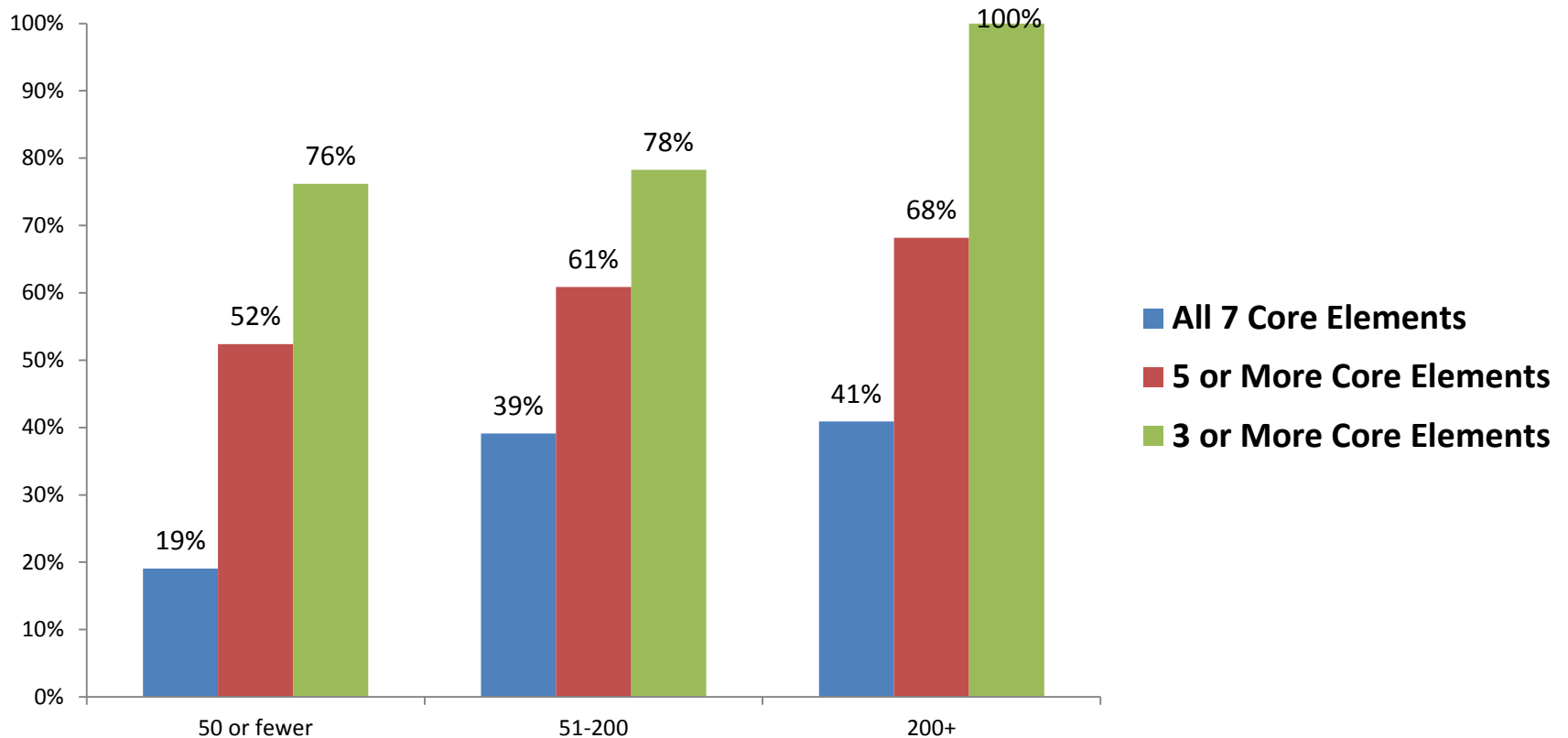


Percent Meeting 3 or more Core Elements

Arizona – 85%



Core Elements by Bedsize



DEPARTMENT OF HEALTH AND HUMAN SERVICES**Centers for Medicare & Medicaid Services****42 CFR Parts 405, 431, 447, 482, 483, 485, and 488****[CMS–3260–P]****RIN 0938–AR61****Medicare and Medicaid Programs; Reform of Requirements for Long-Term Care Facilities****AGENCY:** Centers for Medicare & Medicaid Services (CMS), HHS.**ACTION:** Proposed rule.

SUMMARY: This proposed rule would revise the requirements that Long-Term Care facilities must meet to participate in the Medicare and Medicaid programs. These proposed changes are necessary to reflect the substantial advances that have been made over the past several years in the theory and practice of service delivery and safety. These proposals are also an integral part of our efforts to achieve broad-based improvements both in the quality of health care furnished through federal programs, and in patient safety, while at the same time reducing procedural burdens on providers.

4. *By hand or courier.* Alternatively, you may deliver (by hand or courier) your written comments only to the following addresses prior to the close of the comment period:

a. For delivery in Washington, DC—Centers for Medicare & Medicaid Services, Department of Health and Human Services, Room 445–G, Hubert H. Humphrey Building, 200 Independence Avenue SW., Washington, DC 20201.

(Because access to the interior of the Hubert H. Humphrey Building is not readily available to persons without federal government identification, commenters are encouraged to leave their comments in the CMS drop slots located in the main lobby of the building. A stamp-in clock is available for persons wishing to retain a proof of filing by stamping in and retaining an extra copy of the comments being filed.)

b. For delivery in Baltimore, MD—Centers for Medicare & Medicaid Services, Department of Health and Human Services, 7500 Security Boulevard, Baltimore, MD 21244–1850.

If you intend to deliver your comments to the Baltimore address, call telephone number (410) 786–9994 in advance to schedule your arrival with one of our staff members.

Comments erroneously mailed to the addresses indicated as appropriate for hand or courier delivery may be delayed.

Comments received timely will also be available for public inspection as they are received, generally beginning approximately 3 weeks after publication of a document, at the headquarters of the Centers for Medicare & Medicaid Services, 7500 Security Boulevard, Baltimore, Maryland 21244, Monday through Friday of each week from 8:30 a.m. to 4 p.m. To schedule an appointment to view public comments, phone 1–800–743–3951.

Acronyms

Because of the many terms to which we refer by acronym in this proposed rule, we are listing the acronyms used and their corresponding meanings in alphabetical order below:

AAA Area Agencies on Aging
 ACL Administration for Community Living
 ADL Activities of Daily Living
 ADRCS Aging and Disability Resource Center
 AHCA American Health Care Association
 AHLA American Health Lawyers Association
 ANSI American National Standards Institute
 ASPE Assistant Secretary for Planning and Evaluation
 BPSD Behavioral and Psychological Symptoms of Dementia
 CARIE Center for Advocacy Rights and Interests
 CASPER Certification and Survey Provider Enhanced Reports

- An Antibiotic Stewardship Program
 - Includes antibiotic use protocols
 - A system to monitor antibiotic use

How Did We Get Here?

A Brief History of Antimicrobial Stewardship

Mark Redell, PharmD

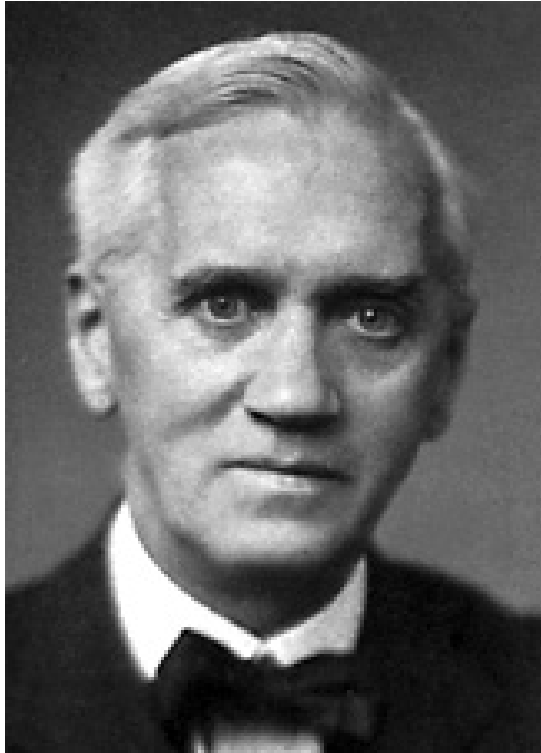
Vice-President, Global Health Sciences

The Medicines Company



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Words to Heed From Decades Past



“The public will demand [the drug and]...then will begin an era...of abuses. The microbes are educated to resist penicillin and a host of penicillin-fast organisms is bred out which can be passed to other individuals and perhaps from there to others until they reach someone who gets a septicemia or a pneumonia which penicillin cannot save. In such a case the thoughtless person playing with penicillin treatment is morally responsible for the death of the man who finally succumbs to infection with the penicillin-resistant organism. I hope the evil can be averted.”

Sir Alexander Fleming. Penicillin's finder assays its future. New York Times 1945; 21.

Selection Pressure

- Antibiotic resistance is a direct result of antibiotic use with two trends contributing to a global scale-up in antibiotic use.
 - First, rising incomes are increasing access to antibiotics. That is saving lives but also increasing use—both appropriate and inappropriate—which in turn is driving resistance.
 - Second, the increased demand for animal protein and resulting intensification of food animal production is leading to greater use of antibiotics in agriculture, again driving resistance.
- Evidence from around the world indicates an overall decline in the total stock of antibiotic effectiveness: resistance to all first-line and last-resort antibiotics is rising.

Center for Disease Dynamics, Economics & Policy. 2015. *State of the World's Antibiotics, 2015*. CDDEP: Washington, D.C.



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The Impact of Healthcare-Associated Infections (HAIs) in the USA

- The Centers for Disease Control and Prevention (CDC) estimates that 1.7 million patients contract healthcare-associated infections every year and nearly 99,000 of them die ^{1,3,4}
- The annual direct medical costs of HAIs to hospitals range from \$28.4 to \$33.8 billion and the attributable cost of treating a HAI averaged \$8,832^{2,3,4}
- These additional costs are largely driven by 2 factors: inappropriate early therapy and delays created in identification of antibiotic resistance phenotypes

1 Klevens R, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports. 2007;122:160-166

2 Scott, RD. The direct medical costs of healthcare-associated infections in U.S. hospitals and the benefits of prevention, 2009. Division of Healthcare Quality Promotion, National Center for Preparedness, Detection, and Control of Infectious Diseases, Coordinating Center for Infectious Diseases, Centers for Disease Control and Prevention, 2009.

3 GAO Report; April 16, 2008; GAO-08-283; HHS Action Plan to Prevent HAIs; released Jan 6, 2009

4 <http://www.ihl.org/IHI/Programs/Campaign/Campaign.htm?TabId=2#InterventionMaterials>



Antibiotic Resistance Can Be Considered an Adverse Event

ASHP definition of an adverse event:

- “Any unexpected, unintended, undesired, or excessive response to a drug that: 1) requires discontinuing the drug (therapeutic or diagnostic); 2) requires changing the drug therapy; 3) requires modifying the dose (except for minor dosage adjustments); 4) necessitates admission to a hospital; 5) prolongs stay in a health care facility; 6) necessitates supportive treatment; 7) significantly complicates diagnosis; 8) negatively affects prognosis; 9) results in temporary or permanent harm, disability, or death.”

FDA definition of a serious adverse event (related to drugs or devices)

- Events in which “the patient outcome is death, life-threatening (real risk of dying) condition, hospitalization (initial or prolonged), disability (significant, persistent, or permanent), congenital anomaly, or required intervention to prevent permanent impairment or damage.”

World Health Organization (WHO) definition of an adverse drug reaction:

- “Any response to a drug which is noxious and unintended, and which occurs at doses normally used in man for prophylaxis, diagnosis, or therapy of disease, or for the modification of physiological function.”

CDC Antibiotic Resistance Threats Report

- First federal engagement in antibiotic resistance
- The U.S. Centers for Disease Control and Prevention (CDC) estimates that antibiotic resistance is responsible for more than 2 million infections and 23,000 deaths each year in the United States, at a direct cost of \$20 billion and additional productivity losses of \$35 billion
- Report divided 18 pathogens into “urgent threats” (3), “serious threats” (12), and “concerning threats”
- Technical and methodological issues may underestimate several-fold the incidence, number of infections, and attributable mortality



Report available at: <http://www.cdc.gov/drugresistance/threat-report-2013/> (accessed 24-Apr-2016)

CDC Categorization of Resistance Threats (n=18)

(Highlighted = Frequent Hospital HAIs)

Urgent	Serious	Concerning
<i>Clostridium difficile</i>	Multidrug resistant <i>Acinetobacter</i>	Vancomycin-resistant <i>Staphylococcus aureus</i> (VISA)
Carbapenem-resistant Enterobacteriaceae (CRE)	Drug-resistant <i>Campylobacter</i>	Erythromycin-resistant Group A <i>Streptococcus</i>
Drug-resistant <i>Neisseria gonorrhoeae</i>	Fluconazole-resistant <i>Candida</i>	Clindamycin-resistant Group B <i>Streptococcus</i>
	Extended spectrum beta-lactamase producing Enterobacteriaceae (ESBLs)	
	Vancomycin-resistant <i>Enterococcus</i> (VRE)	
	Multidrug-resistant <i>Pseudomonas aeruginosa</i>	
	Drug-resistant non-typhoidal <i>Salmonella</i>	
	Drug-resistant <i>Salmonella typhi</i>	
	Drug-resistant <i>Shigella</i>	
	Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA)	
	Drug-resistant <i>Streptococcus pneumoniae</i>	
	Drug-resistant tuberculosis	

Report available at: <http://www.cdc.gov/drugresistance/threat-report-2013/> (accessed 24-Apr-2016)

Additional Federal Actions: September 2014

Executive Order 13676: Combating Antibiotic-Resistant Bacteria

- Sets forth policy to detect, prevent, and control illness and death
- Establish a task force co-chaired by the Secretaries of Defense, Agriculture, and Health and Human Services Department (HHS)
- Develop a five-year National Action Plan
- Establish the Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria
- **Improve antibiotic stewardship and use of antibiotics by hospitals and other inpatient healthcare delivery facilities**
- Strengthen national surveillance systems and laboratory networks
- Prevent and respond to infections and outbreaks
- Promote new and next-generation antibiotics and diagnostics
- Support cooperation of international antibiotic resistance efforts

September 2014 (cont'd)

- Sec. 5. Improved Antibiotic Stewardship. (a) By the end of calendar year 2016, HHS shall review existing regulations and propose new regulations or other actions, as appropriate, that require hospitals and other inpatient healthcare delivery facilities to implement robust antibiotic stewardship programs that adhere to best practices, such as those identified by the CDC. HHS shall also take steps to encourage other healthcare facilities, such as ambulatory surgery centers and dialysis facilities, to adopt antibiotic stewardship programs. ¹
- The President's Council of Advisors on Science and Technology (PCAST) released its report to the President on Combating Antimicrobial Resistance in the U.S. with key recommendations focusing on antibiotic resistance policy, stewardship, and surveillance. ²

¹ National Strategy to Combat Antibiotic-Resistant Bacteria, Report available at:

http://www.cdc.gov/drugresistance/pdf/carb_national_strategy.pdf

² Report to the President on Combatting Antibiotic Resistance; available at:

https://www.whitehouse.gov/sites/default/files/microsites/ostp/PCAST/pcast_carb_report_sept2014.pdf

March 2015

- The White House released the National Action Plan for Combating Antibiotic Resistant Bacteria, which outlines steps for implementing the National Strategy and addressing policy recommendations of the President's Council of Advisors on Science and Technology (PCAST) report on combating antibiotic resistance.
- The National Action Plan outlines federal activities over the next five years to:
 - Enhance domestic and international capacity to prevent and contain outbreaks of antibiotic-resistant infections
 - Maintain the efficacy of current and new antibiotics
 - Develop and deploy next-generation diagnostics, antibiotics, vaccines, and other therapeutics

Report to the President on Combatting Antibiotic Resistance; available at:

https://www.whitehouse.gov/sites/default/files/docs/national_action_plan_for_combating_antibiotic-resistant_bacteria.pdf



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White House Forum on Antibiotic Stewardship

- On June 2, 2015, the White House hosted the Forum on Antibiotic Stewardship to bring together more than 100 key human and animal health leaders involved in antibiotic stewardship to promote optimal use of antibiotics nationwide.
- Examples of stewardship commitments include:
 - CDC and other HHS agencies will provide data about antibiotic use and prescribing trends in order to improve antibiotic use in the future and cut inappropriate prescribing by **50 percent in doctors' offices and 20 percent in hospitals**.
 - Healthcare systems representing thousands of hospitals, LTACHs, and SNFs will establish or expand stewardship programs to improve prescribing.
 - Phase out unnecessary antibiotics to animals and commit to providing more antibiotic-free options to consumers.
- Federal budget support (\$160 mil 2016; additional \$40 mil in FY 2017) for CDC's Antibiotic Resistance Solutions Initiative

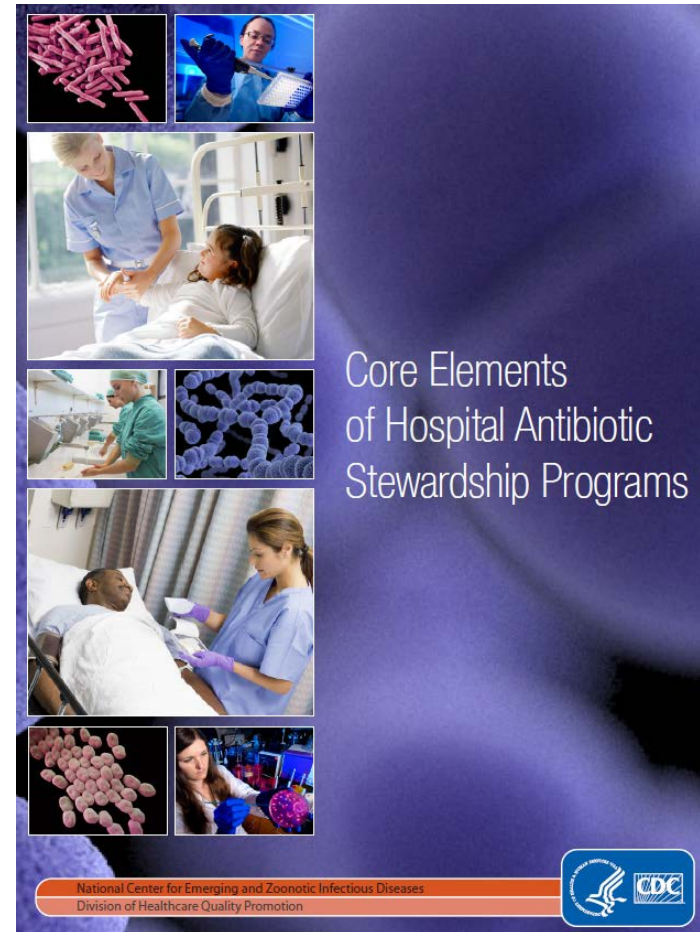
More Information on Forum available at: <https://www.whitehouse.gov/blog/2015/06/02/white-house-hosts-forum-combating-antibiotic-resistance>; <https://www.whitehouse.gov/blog/2015/06/03/white-house-forum-antibiotic-stewardship-convenes-government-and-private-sector-lead>



Core Elements

- Summarizes core elements of successful hospital Antibiotic Stewardship Programs (ASPs).
- Complements existing guidelines on ASPs from IDSA, SHEA, PIDS, ASHSP, TJC.
- Almost 40 check-offs in several ASP activities.
- There is no single template for a program to optimize antibiotic prescribing in hospitals. The complexity of medical decision making surrounding antibiotic use and the variability in the size and types of care among U.S. hospitals require flexibility in implementation.

CDC. Core Elements of Hospital Antibiotic Stewardship Programs. Atlanta, GA: US Department of Health and Human Services, CDC; 2014. Available at: <http://www.cdc.gov/getsmart/healthcare/implementation/core-elements.html>.



California Dept Public Health – ASP Toolkit

- Sept 2014, CA Senate Bill 1311 required all acute care hospitals to adopt and implement ASPs by July 1, 2015
 - Adopt and implement an ASP per guidelines established by the federal government and professional organizations, including a process to evaluate the judicious use of antibiotics
 - Develop a physician supervised multidisciplinary ASP committee or workgroup
 - Appoint to this group at least 1 physician or pharmacist who has been trained in ASP or attended a certification program held by the CDC, SHEA, IDSDA, or similar
 - Report ASP activities to P&T Committees or otherwise which are responsible for CQI
- To assist in mentorship and achieving a high level of ASP activities, all acute care hospitals were graded according to 11 criteria and categorized as basic, intermediate, and advanced

<https://www.cdph.ca.gov/programs/hai/Documents/ASPToolkitReviewedLC042815FINAL.pdf>



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Messages & Opportunities Abound

- CDC Vital Signs
- CMS Surveyor Worksheet, 2015* (Section 1. C. Systems to prevent transmission of MDROs and promote antibiotic stewardship)
- TJC Proposed Standards, Nov 2015
- National Action Plan to Prevent Healthcare-Associated Infections
- Multiple toolkits
- NSPG - Performance Measures
- IDSA and ID Week
- Certification programs, i.e., SIDP, MAD-ID, IDAC (www.idac.org)

* <https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/Survey-and-Cert-Letter-15-12-Attachment-1.pdf>

Vital Signs: Improving Antibiotic Use Among Hospitalized Patients

Scott Fridkin, MD¹, James Baggs, PhD¹, Ryan Fagan, MD¹, Shelley Magill, MD, PhD¹, Lori A. Pollack, MD¹, Paul Malpiedi, MPH¹, Rachel Slayton, PhD¹, Karim Khader, PhD², Michael A. Rubin, MD, PhD², Makoto Jones, MD¹, Matthew H. Samore, MD², Ghinwa Dumyati, MD¹, Elizabeth Dodds-Ashley, PharmD³, James Meek, MPH⁴, Kimberly Yousey-Hindes, MPH⁴, John Jernigan, MD¹, Nadine Shehab, PharmD¹, Rosa Herrera¹, L. Clifford McDonald, MD¹, Amy Schneider, MPH¹, Arjun Srinivasan, MD¹ (Author affiliations at end of text)

Vital Signs: Estimated Effects of a Coordinated Approach for Action to Reduce Antibiotic-Resistant Infections in Health Care Facilities — United States

Rachel B. Slayton, PhD¹, Damon Toth, PhD², Bruce Y. Lee, MD³, Windy Tanner, PhD², Sarah M. Bartsch, MPH³, Karim Khader, PhD², Kim Wong, PhD⁴, Kevin Brown, PhD², James A. McKinnell, MD⁵, William Ray², Loren G. Miller, MD⁶, Michael Rubin, MD, PhD², Diane S. Kim⁷, Fred Adler, PhD⁸, Chenghua Cao, MPH⁷, Lacey Avery, MA¹, Nathan T.B. Stone, PhD⁹, Alexander Kallen, MD¹, Matthew Samore, MD², Susan S. Huang, MD⁷, Scott Fridkin, MD¹, John A. Jernigan, MD¹

Vital Signs: Preventing Antibiotic-Resistant Infections in Hospitals — United States, 2014

Lindsey M. Weiner, MPH¹, Scott K. Fridkin, MD¹, Zuleika Aponte-Torres, MPH¹, Lacey Avery, MA¹, Nicole Coffin, MA¹, Margaret A. Dudeck, MPH¹, Jonathan R. Edwards, MStat¹, John A. Jernigan, MD¹, Rebecca Konnor, MPH¹, Minn M. Soe, MBBS, MPH¹, Kelly Peterson¹, L. Clifford McDonald, MD¹

Summary: Why Does Antimicrobial Overuse Persist? And What Happens If We Don't Fix It

- Estimated that annual deaths in the USA due to increasing antibiotic-resistant infections will climb 30-fold by 2050 (~320,000)¹
 - Equates to \$20 bill excess healthcare costs and \$35 bill in lost productivity annually
- How do we preserve our current antibiotics and solve the problems of antibiotic overuse? Ideas:
 - Challenge clinicians why individual and collective contributions to overuse is an ethical issue and what specific moral questions it raises²
 - Regulatory mandates to convince hospital administration to fund and staff ASPs³
 - Process and outcome measures which are tied to prescriber accreditation³
 - Required certification, coursework, and ongoing educational modules³
 - Embrace quality-of-care improvements and disease-state management as part of a continuous quality improvement effort; abandon costs as the primary goal of ASPs⁴
 - Discuss strategies which blend Locke's individualism and Rousseau's collectivism⁵

1 Hampton T. JAMA. Published online June 3, 2015, News & Analysis; 2 Littmann J et al. Public Health Ethics. 2015;1-16; 3 Policy Statement SHGEA, IDSA, PIDS. Infect Control Hosp Epidemiol. 2012;33:322-7; 4 Dodds-Ashley E et al. Clin Infect Dis.2014;59(suppl 3):S112-21; 5 Flanders S, Saint S. JAMA Internal Med. Published online March 4, 2014



Potential CMS Metrics Application Using Real World Examples

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Health and Wellness for all Arizonans

Outline

- Present CMS metrics as they pertain to antimicrobial stewardship (1.C.9 – 1.C.13 from CMS Hospital Infection and Control Worksheet)¹
- Review current Infectious Diseases Society of America guidelines on Antimicrobial Stewardship
- Provide perspective and examples from our institutions
 - Dana – smaller, community hospital
 - Chris – multi-hospital, health system

1 Three Hospital Surveyor Worksheets Finalized: The Centers for Medicare & Medicaid Services (CMS) has finalized surveyor worksheets for assessing compliance with three Medicare hospital Conditions of Participation (CoPs): Quality Assessment and Performance Improvement (QAPI), Infection Control, and Discharge Planning. The worksheets are used by State and Federal surveyors on all survey activity in hospitals when assessing compliance with any of these three CoPs. <https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/Survey-and-Cert-Letter-15-12-Attachment-1.pdf> (accessed 5/2/2016)



CMS Metric 1.C.9

- The hospital has written policies and procedures whose purpose it is to improve antibiotic use (antibiotic stewardship)

Centers for Medicare and Medicaid Services, Hospital Infection Control Worksheet



Health and Wellness for all Arizonans

IDSA Guideline Recommendations

- The support and collaboration of hospital administration, medical staff leadership, and local providers in the development and maintenance of antimicrobial stewardship programs is essential (A-III)
- It is desirable that antimicrobial stewardship programs function under the auspices of quality assurance and patient safety (A-III)

Barlam TF, et al. Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. Clin Infect Dis. 2016;62:1-27.



KRMC Experience – Program Structure

- The Antimicrobial Stewardship Program started January 2014
- Meeting frequency (every other month, then monthly)
- Reports to Pharmacy and Therapeutics Committee, then to Medical Executive Committee

HonorHealth Experience – Program Structure

- Recent merger between Scottsdale Healthcare and John C. Lincoln Hospitals
- Varying degrees of stewardship program structure for each organization over past 10 years
- Integrated Network Antimicrobial Stewardship Committee meeting monthly, with Medical Director as chair
- Report to Pharmacy and Therapeutics Committee and Medical Executive Committee

CMS Metric 1.C.10

- The hospital has a designated leader (e.g., physician, pharmacist, etc) responsible for program outcomes of antibiotic stewardship activities at the hospital

IDSA Guideline Recommendation

- The infectious diseases physician and the head of pharmacy, as appropriate, should negotiate with hospital administration to obtain adequate authority, compensation, and expected outcomes for the program (A-III)
- Hospital administrative support for the necessary infrastructure to measure antimicrobial use and to track use on an ongoing basis is essential (A-III)

Barlam TF, et al. Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. Clin Infect Dis. 2016;62:1-27.



Health and Wellness for all Arizonans

HonorHealth Experience – Infrastructure

- **Network Medical Director – Infection Control and Stewardship (chair)**
- **ID-trained Pharmacist**
- Network Microbiology Lab Manager
- Network Director of Infection Control (Division of Quality)
- Network Clinical Pharmacy Coordinators
- Network Director of Nursing Practice
- Informatics

HonorHealth Experience – Infrastructure

Physician Representatives (multiple private practice groups)

- Infectious Diseases
- Hospitalists
- Critical Care/Pulmonary
- Emergency
- Chief Medical Officer (Administrative)
- Surgery
- Oncology
- Bone Marrow Transplant (if applicable)
- Solid Organ Transplant (if applicable)

HonorHealth Experience – Infrastructure

- Antimicrobial Stewardship Committee Key Points
 - Involve as many physician groups and specialties as possible to ensure appropriate representation and buy-in
 - Select members who are engaged, consider minimum requirements for attendance, roles and responsibilities of each member
 - Committee should meet frequently enough to be relevant and dynamic
 - Establish antimicrobial stewardship goals for the organization
 - Develop methods for multidisciplinary education, communication of major initiatives, staff engagement

KRMC Experience – Infrastructure

- ID physician (co-chair)
- ID pharmacist (co-chair)
- Microbiologist
- Infection Preventionist
- Clinical pharmacy coordinator/critical care pharmacist
- Critical care physician/hospitalist program director
- Nursing

CMS Metric 1.C.11

- The hospital's antibiotic stewardship policies and procedures requires practitioners to document in the medical record or during order entry an indication for all antibiotics, in addition to other required elements such as dose and duration

KRMC Experience – Documentation

- Indication/Criteria for use: Linezolid

Selected Visit ☐ Other Visit ☐ No Visit ☐ Do Not Discontinue Orders After End of Visit ☐

Common Patient Based Order Sets Search Personal Favorites Session Defaults

linez

All Meds Labs

Favorites

- Announcements
- IV Fluids
- Laboratory
- Medications
- Patient Care Orders

☐ Linezolid (Zyvox)

Linezolid (Zyvox) 600 mg ORAL

- ☐ Linezolid (Zyvox) 600 mg TAB ORAL BID

Linezolid (Zyvox) 600 mg IV

- ☐ Linezolid (Zyvox) 600 mg/300 mL IV BID
- ☐ Linezolid (Zyvox) 600 mg/300 mL IVPB ONCE

☒ P&T Approved Linezolid Indications

- ☐ Linezolid Indication Linezolid Indication Documented vancomycin resistant enterococcus (VRE) infection
- ☐ Linezolid Indication History of VRE
- ☐ Linezolid Indication MRSA unresponsive to vancomycin
- ☐ Linezolid Indication Confirmed MRSA PNA
- ☐ Linezolid Indication Step-down oral therapy for MRSA resistant to doxycycline and SMX/TMP
- ☐ Linezolid Indication Hypersensitivity to vancomycin

Session Details

StartDateTime
// : 31

Ordered By
...

Order Source
...

Priority
...

Reason for Request
...

TargetCosigner1
...

HonorHealth Experience – Documentation

- Utilize order sets and EHR to guide prescribers to appropriate first line therapies based on indication

▷ Animal Bites

▷ Bronchitis - Acute/Chronic

▷ C. Diff

▽ Cellulitis

Infectious Disease Society of America guidelines recommend CEFAZOLIN for the treatment of NON-PURULENT cellulitis except for patients with a risk for MRSA infection.

▽ First Line Initial Therapy

- ☐ cefazolin (ANCEF) (\$) (Non-purulent or MSSA only)
1 g, Intravenous, Every 8 hours scheduled (3 times per day)
- ☐ vancomycin (VANCOCIN) (\$) (if Type 1 allergy or purulent cellulitis)
1,000 mg, Intravenous, Every 12 hours

▷ Alternative Second Line Initial Therapy (Due to intolerance or resistance to first line therapy)

0 of 1 selected

▷ Central line infection

▷ Diabetic Foot

▷ Endocarditis

▷ Febrile Neutropenia

▷ Infectious Diarrhea (NOT C. DIFF)

▷ Intra - Abdominal Infection

▷ Joint Infection

▷ Meningitis

▷ Pneumonia - Community Acquired

HonorHealth Experience – Documentation

ceFAZolin (ANCEF) 1 g in sodium chloride 0.9 % MBP 50 mL IVPB ✓ Accept ✗ Cancel

Reference Links: 1. [Micromedex](#) 2. [Black Box Warning](#)

Report: No Creatinine Clearance results found.

Dose: g 500 mg 1 g 2 g

Administer Dose: 1 g

Administer Amount: 1 g

Route: Intravenous

Frequency: ON CALL TO OR Q12H Q8H

For: ☒ Doses ☐ Hours ☐ Days

Starting: Today Tomorrow

First Dose: Include Now As Scheduled

First Dose: Today 1400 Until Discontinued Show Additional Options

Scheduled Times: [Hide Schedule](#) [Adjust Schedule](#) (3 times per day)

4/28/16	1400, 2200
4/29/16	0600, 1400, 2200
4/30/16	0600, 1400, 2200

Order has no end date or number of doses, so more times will be scheduled at a later date.

Indications: Skin and Skin Structure Infection

Admin. Inst.: [This is a time-critical scheduled medication. Please administer at the time indicated or within 30 minutes before or after the sc...](#)

Prod. Admin. Inst.: (none)

☐ Self Administered ☐ Patient supplied: doses

CMS Metric 1.C.12

- The hospital has a formal procedure for all practitioners to review the appropriateness of any antibiotics prescribed after 48 hours from the initial orders (e.g., antibiotic time out)

IDSA Guideline Recommendation

- Antibiotic time-outs, stop orders, etc to encourage prescribers to perform routine review of antibiotic regimens to improve antibiotic prescribing are recommended (weak recommendation, low-quality evidence)
- A safety mechanism should be paired with stop orders
 - Avoids unintended interruptions
 - Prevents alienating prescribers against antibiotic stewardship interventions

Barlam TF, et al. Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. Clin Infect Dis. 2016;62:1-27.

HonorHealth Experience – Antibiotic Time-Out

- Antimicrobial Stewardship Patient Scoring Dashboard
 - Modify patient list based on user
 - Individual units or teams (decentralized pharmacists or clinical specialists)
 - Whole house (ID pharmacist, ID medical director)
 - Broad-spectrum antibiotics > 72 hours
 - > 7 days of antibiotics
- Use caution when committing to automatic hard stop protocols
 - Communication barriers (passive vs. active)
 - Physician cross-coverage
 - Antibiotic retiming
 - Patient safety FIRST!

KRMC Experience – Antibiotic Time-Out

- Pharmacy alert
 - Current antibiotic > 72 hours and no positive cultures
 - > 7 days of antibiotics
 - Scheduled and on-demand reports
 - All patients on antibiotics
 - All patients on antibiotics > 3 days

	Alert Type  	Description 	Patient 	Date/Time 	Location 
 	Prolonged Abx Therapy > 7 days	<u>cefepime 2000 MG Injection-IV (10d) - intravenous;</u>			
Drug/Class		Start		Days	Schedule
CEFEPIME 2GM/50ML IVPB				11	
Document View Patient Details Snooze Hide for Me Hide for All					

CMS Metric 1.C.13

- The hospital monitors antibiotic use (consumption at the unit and/or hospital level)

CMS Proposed Rule for Hospital Payment and Quality Reporting

- For FY2017, CMS is proposing a rule to include hospitals' antibiotic prescribing data to the CMS Hospital Inpatient Quality Reporting (IQR) Program
- Prescribing data would be submitted to CMS through the CDC's National Healthcare Safety Network (NHSN) Antimicrobial Use module

Centers for Medicare and Medicaid Services, Hospital Infection Control Worksheet



Health and Wellness for all Arizonans

IDSA Guideline Recommendation

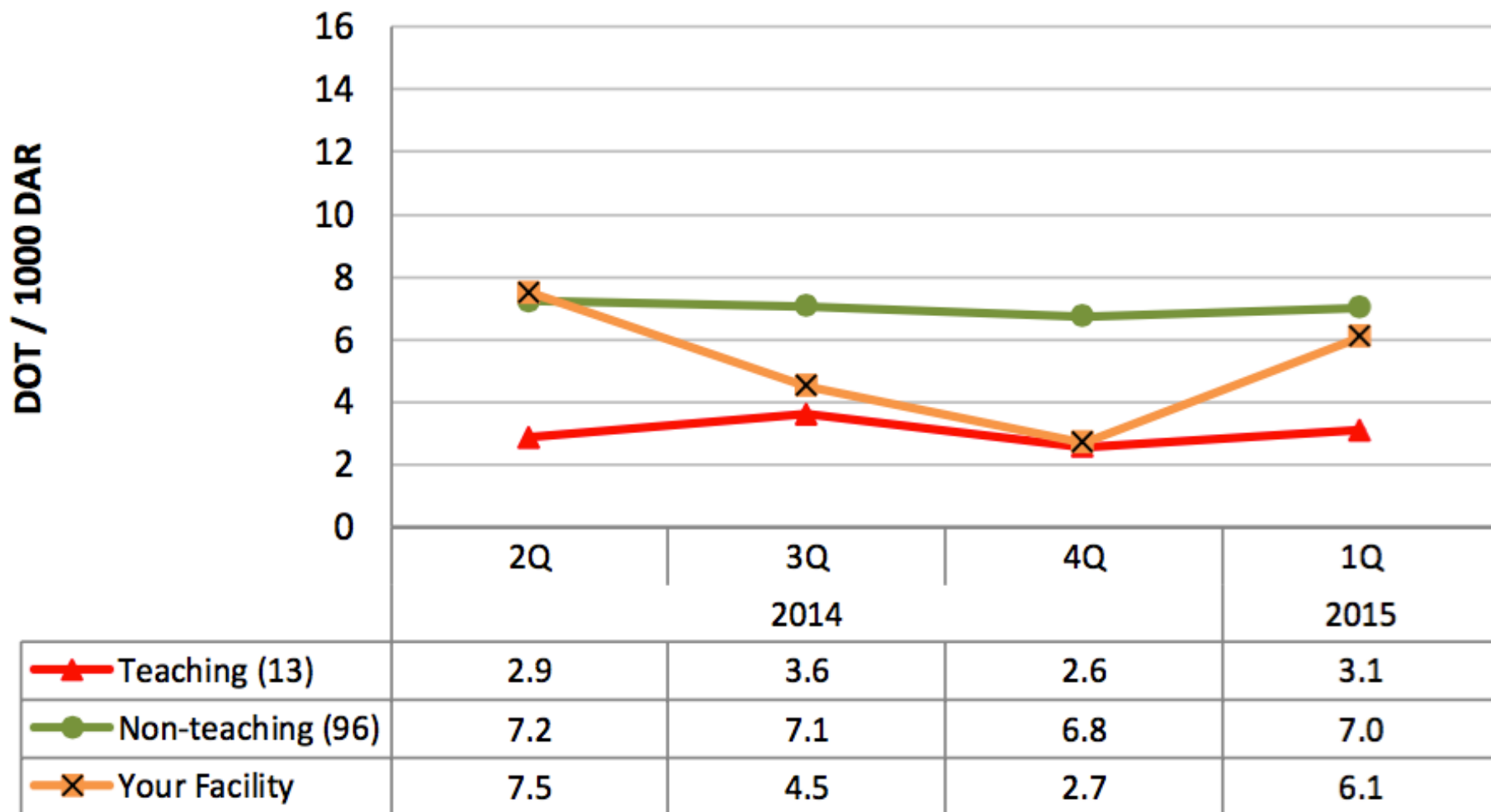
- Antibiotic use as measured by DOT (Days of Therapy) in preference to DDD (Defined Daily Doses) (weak recommendation, low-quality evidence)
- Every ASP must measure antibiotic use, stratified by antibiotic
- DDDs remain an alternative for sites that cannot obtain patient-level antibiotic use data

Barlam TF, et al. Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. Clin Infect Dis. 2016;62:1-27.



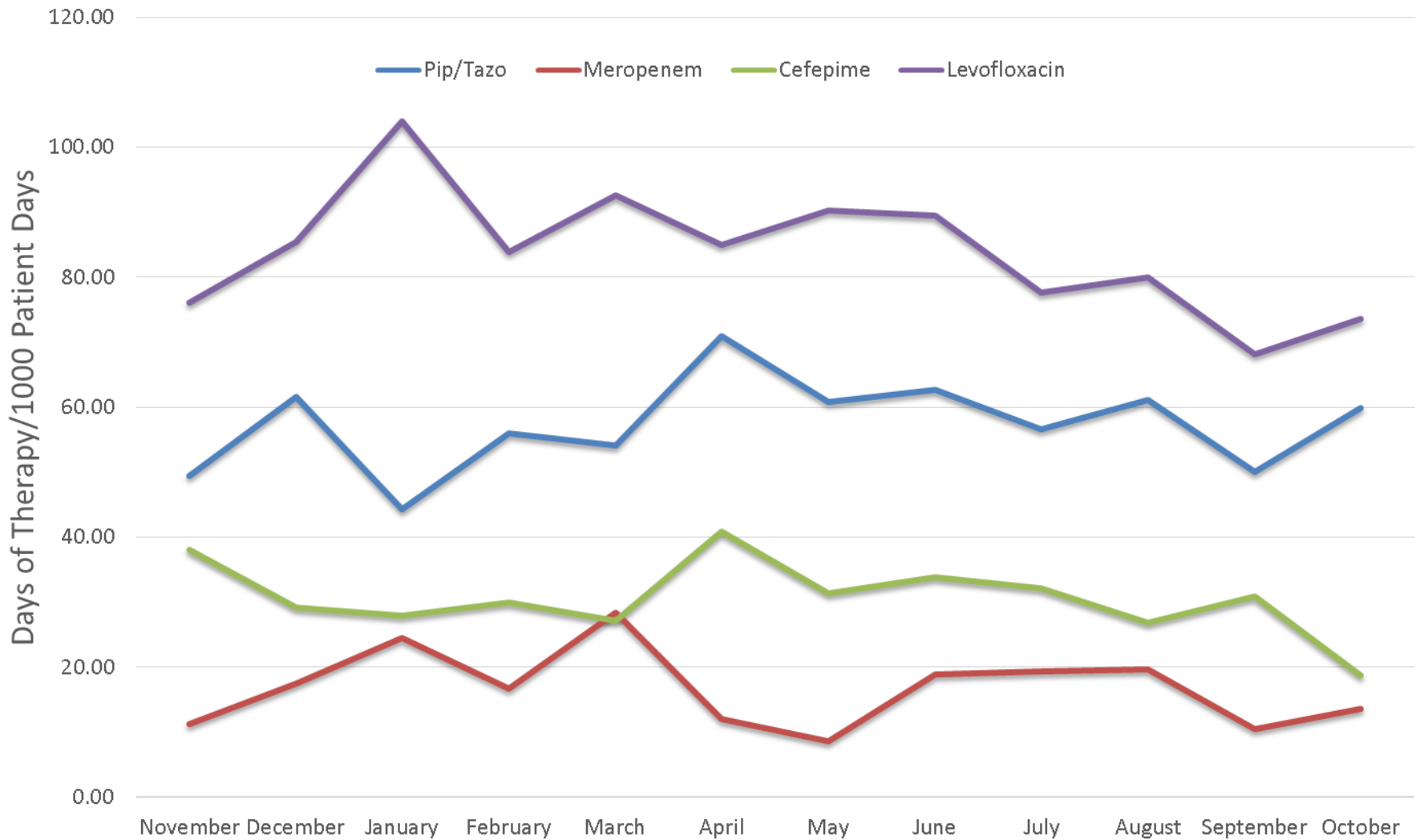
Health and Wellness for all Arizonans

KRMC Experience – Antibiotic Usage



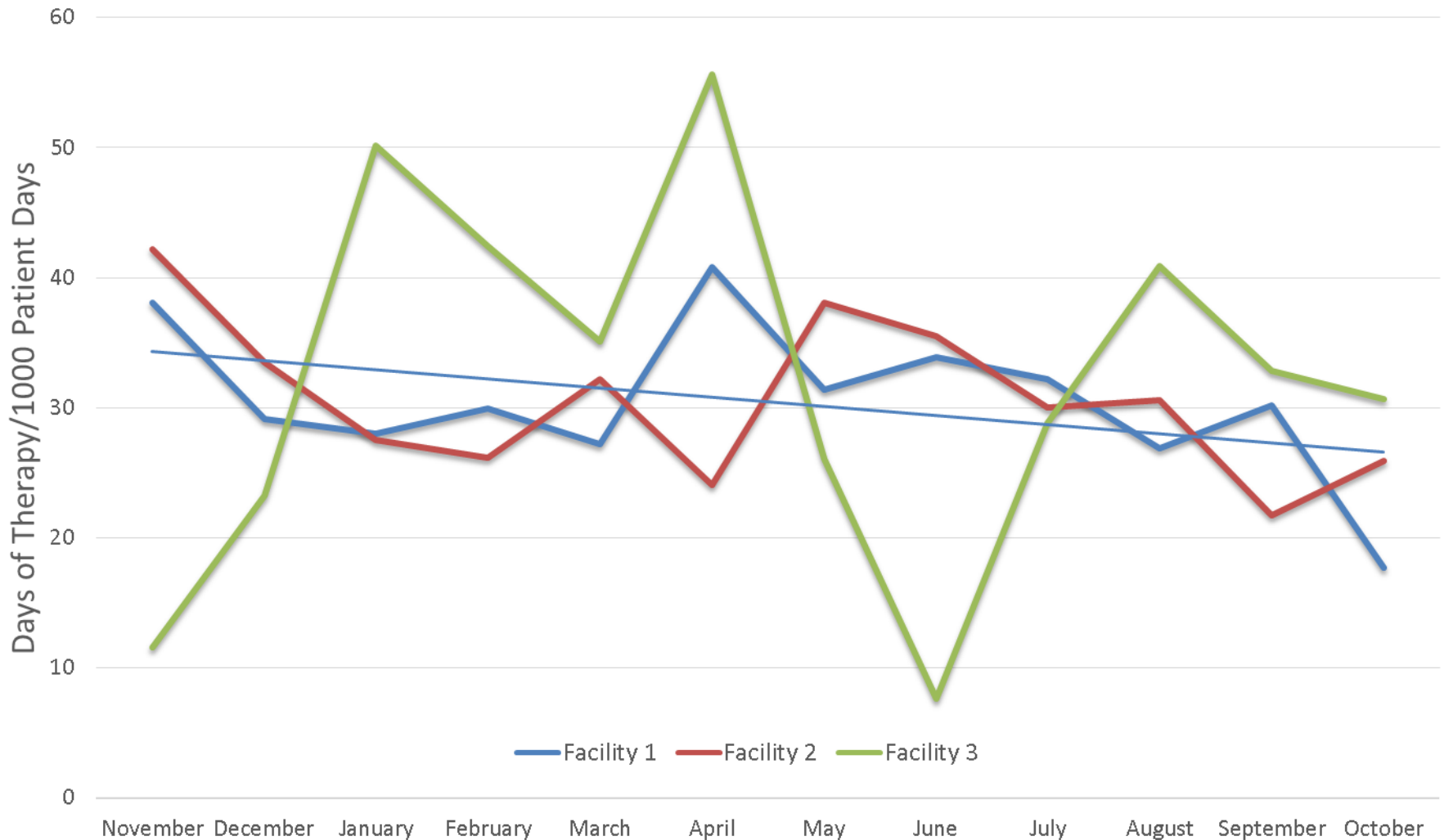
HonorHealth Experience – Antibiotic Usage

Broad-Spectrum Antibiotic Use (Single Facility)



HonorHealth Experience – Antibiotic Usage

Cefepime Use (Multiple Facilities)

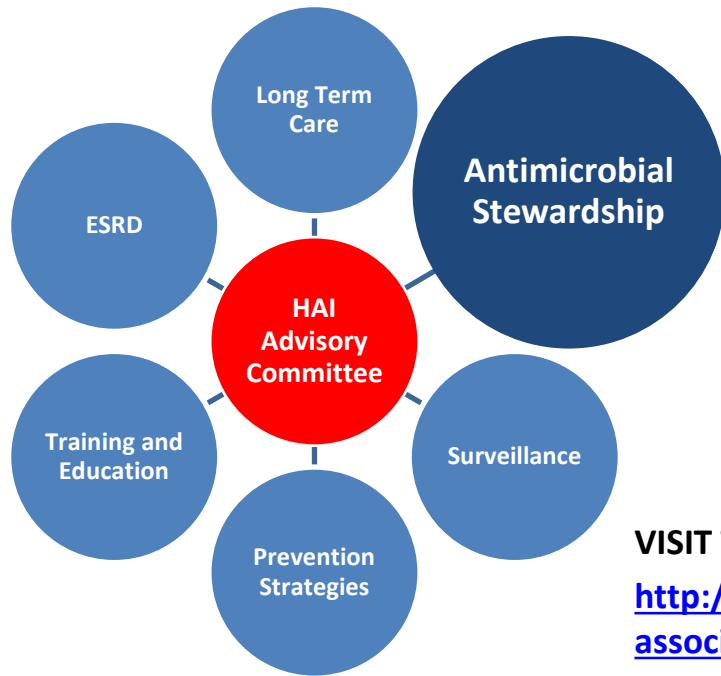


Summary

- Inform yourself
 - MAD-ID / SIDP Stewardship Certificate
 - ASHP Accelerating Antimicrobial Stewardship Programs
 - Other Antimicrobial Stewardship CEs
- Get involved
 - Network with other people who are doing stewardship
- Try to not get overwhelmed
 - You don't have to start big, but at least start somewhere
- Garner support
 - Support can be found in unlikely places
- You are NOT alone



Antibiotic Stewardship And The Arizona Department of Health Services



- ✓ On the website NOW:
 - ✓ MDRO fact sheet
 - ✓ Antibigram toolkit
 - ✓ Antimicrobial Stewardship Program (ASP) slide set
 - ✓ LTC and Acute Care Hospital/CAH Survey
 - ✓ FAQs and “Contact Us” resource for ASP issues
- ✓ In development:
 - ✓ Business models and tools
 - ✓ Stewardship mentor program
 - ✓ Antibiotic use information for general public
 - ✓and MORE

VISIT THE Healthcare-Associated Infection Advisory Committee website:

<http://azdhs.gov/preparedness/epidemiology-disease-control/healthcare-associated-infection/advisory-committee/index.php>

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