

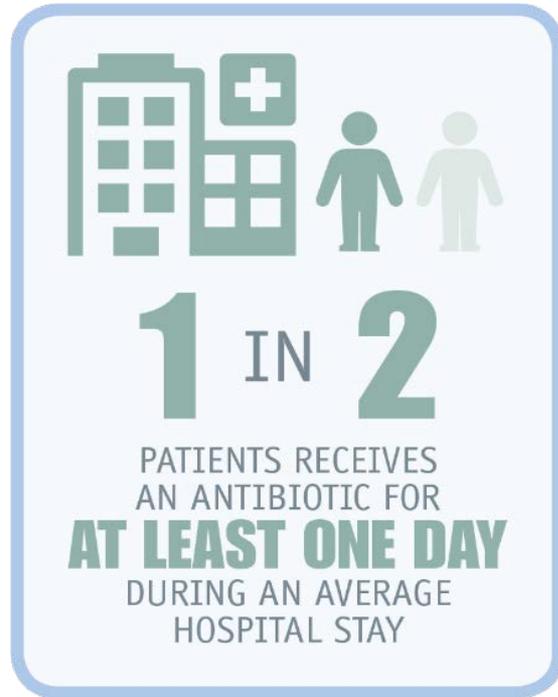


Antibiotic Stewardship: Optimizing Antibiotic Use in Inpatient Setting

Annual NHSN Training – March 29, 2019

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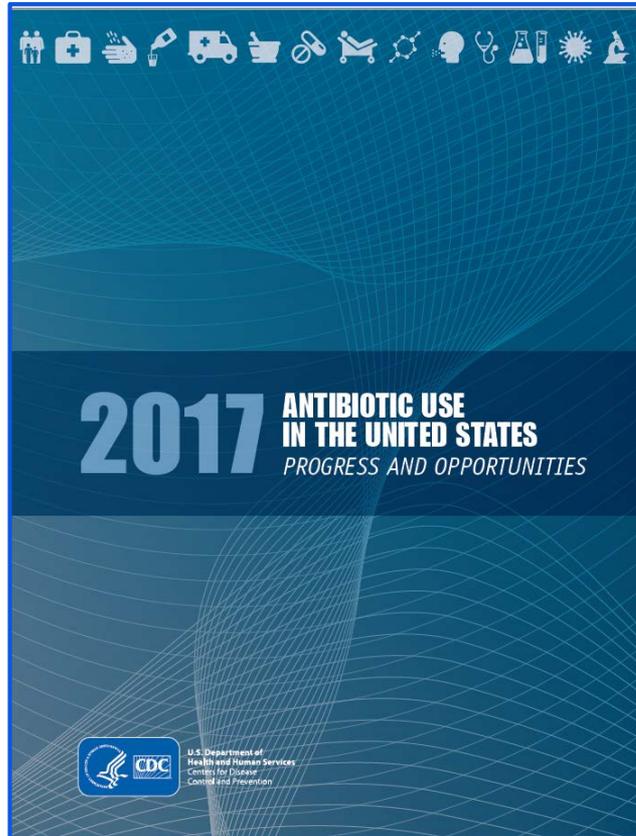
Antibiotic Use in Hospitals



Antibiotic Use in Hospitals

- Thirty percent of antibiotic use is unnecessary or inappropriate.
- Poor prescribing practices are placing patients at unnecessary risk for antibiotic-resistant infections, *Clostridioides difficile* infections, allergic reactions and other adverse events.

CDC's Approach in Improving Antibiotic Use



EXAMPLES OF CDC'S APPROACH TO IMPROVING ANTIBIOTIC USE



DATA FOR ACTION

- ❑ Providing data about facility-level antibiotic use in outpatient settings, hospitals, and nursing homes to help healthcare providers identify opportunities to improve prescribing.
- ❑ Working with partners to develop a benchmark for hospitals to assess their antibiotic use and monitor the impact of antibiotic stewardship programs.



IMPLEMENTATION

- ❑ Providing recommendations for antibiotic stewardship programs and practices in multiple healthcare settings.
- ❑ Providing tools to help organizations incorporate antibiotic stewardship principles into antibiotic use guidelines.
- ❑ Developing tools and providing expertise to support and expand local implementation.
- ❑ Providing expertise to, and coordinating with, other federal partners to develop guidance and tools to implement antibiotic stewardship.
- ❑ Engaging a broad network of partners in healthcare, such as healthcare professional organizations, hospitals, health systems and industry, to implement antibiotic stewardship.



INNOVATION

- ❑ Funding universities and healthcare partners to identify novel ways to implement stewardship activities and improve the implementation of CDC's Core Elements of Antibiotic Stewardship in [hospitals](#), [nursing homes](#), [outpatient settings](#), and [small hospitals in rural areas](#).
- ❑ Advancing the development of diagnostic tests to identify and characterize resistant bacteria by accelerating research and development for new antibiotics.



EDUCATION

- ❑ Leading a national effort to educate Americans about appropriate antibiotic use, and strategies to protect themselves from antibiotic resistance.
- ❑ Spearheading an annual global observance promoting appropriate prescribing and use.
- ❑ Developing an educational effort to emphasize the early recognition, treatment, and reassessment of therapy of sepsis as an important part of antibiotic stewardship.

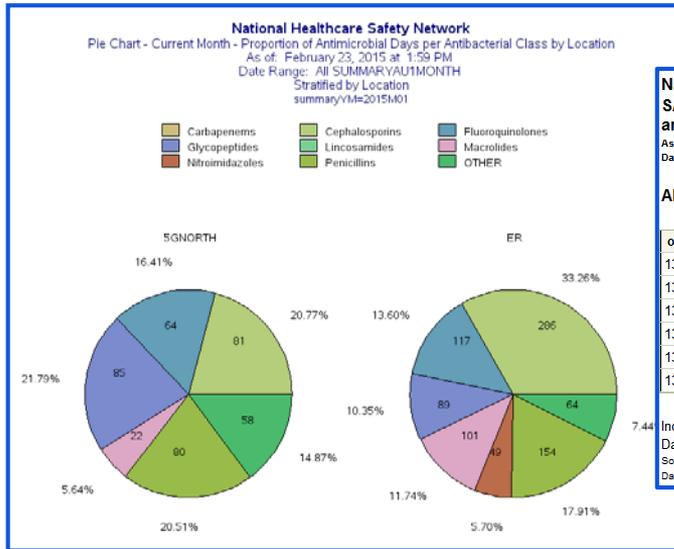
Data for Action

Data for Action

- Measurement has long been a challenge for hospital stewardship programs.
- What to measure? How to do it?
- Internal measures to assess progress are important and a bit easier.
- Comparative measures are strongly desired, but much harder to develop.

NHSN Antimicrobial Use (AU) Option

- Objective: Measure antibiotic use to provide risk-adjusted inter- and intra-facility comparisons



National Healthcare Safety Network
SAARs Table - All Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets

As of: March 14, 2016 at 1:57 PM
Date Range: All AU_SAAR

All antimicrobials used in adult ICUs and wards

orgID	summaryYQ	SAARType	antimicrobialDays	numAUDaysPredicted	numDaysPresent	SAAR	SAAR_pval	SAAR95CI
13860	2014Q1	IND-Adult-1	4416	4421.364	6326	0.999	0.9437	0.970, 1.029
13860	2014Q2	IND-Adult-1	3998	3856.677	5668	1.037	0.0240	1.005, 1.069
13860	2014Q3	IND-Adult-1	3568	3952.912	5765	0.903	0.0000	0.873, 0.933
13860	2014Q4	IND-Adult-1	4287	3837.211	6189	1.117	0.0000	1.084, 1.151
13860	2015Q1	IND-Adult-1	4060	3113.877	5358	1.304	0.0000	1.264, 1.344
13860	2015Q2	IND-Adult-1	407	616.305	1132	0.660	0.0000	0.599, 0.727

Observed Use

Includes data for January 2014 and forward.

Data restricted to medical, medical/surgical and surgical locations.

Source of aggregate data: 2014 NHSN AU Data

Data contained in this report were last generated on February 17, 2016 at 10:02 AM.

SAAR Title

Predicted Use

Calculated SAAR Values

Standardized Antimicrobial Administration Ratio (SAAR)

- CDC developed a benchmarking measure for antibiotic use.
- Similar in principle to the Standardized Infection Ratio (SIR).
- SAAR expresses observed antibiotic use compared to predicted use.
- CDC worked with many partners to develop the SAAR measure to try and make it most useful for stewardship.

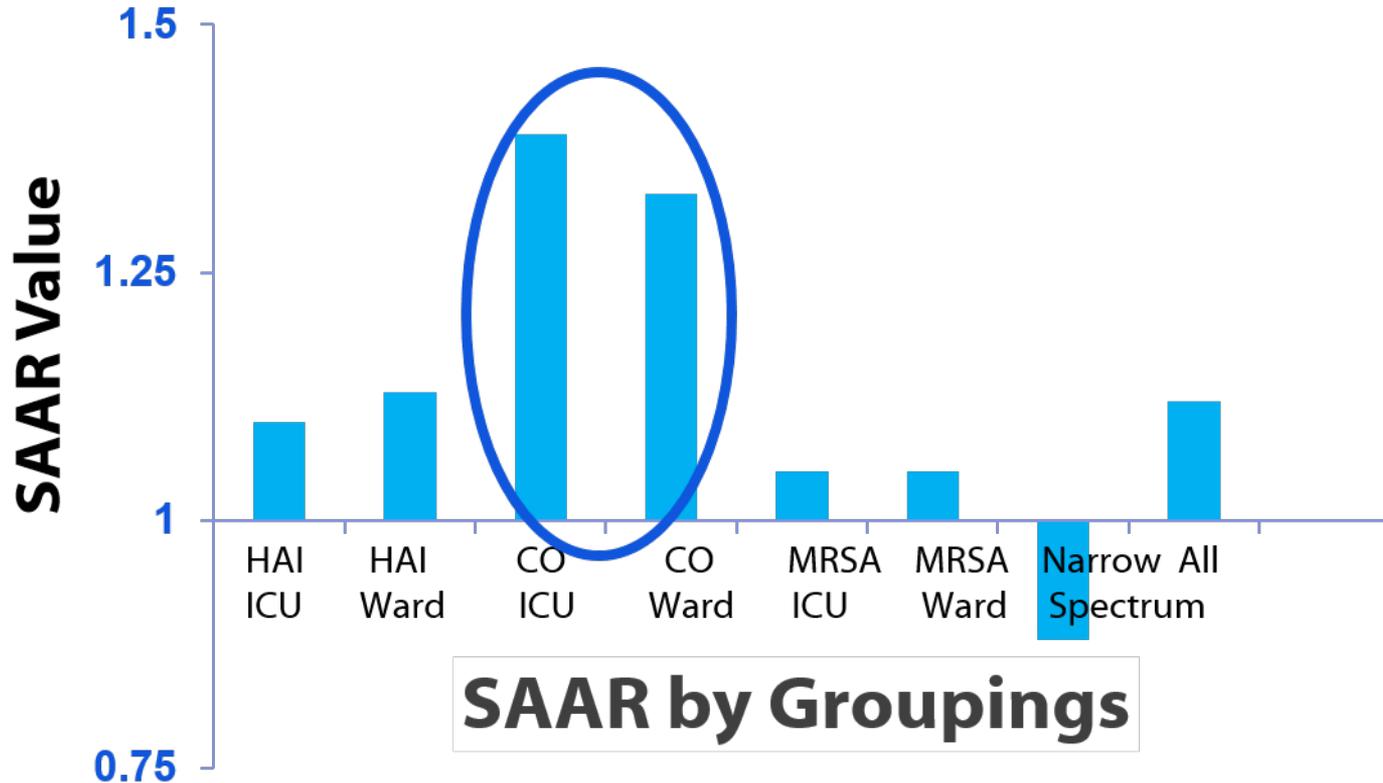
Standardized Antimicrobial Administration Ratio (SAAR)

- SAARs for different patient populations (e.g., adult, peds, ICU, non-ICU).
- SAARs for different groups of antimicrobials:
 - Agents mainly for hospital-onset infections
 - Agents mainly for community-acquired infections
 - Agents mainly for resistant Gram-positive infections
 - Narrow spectrum beta-lactam agents
 - Azithromycin (peds only)
 - Antifungals mainly for invasive candidiasis
 - Antibacterial agents posing the highest risk for CDI infection
 - All antibacterial agents

Role of SAAR

- Experts agree that benchmark measures are extremely helpful in driving hospital improvements.
 - Can provide broader context to internal measures.
 - What if your use is going down by 5% per year, but you find your use is twice as high as other, similar hospitals?
- SAAR data can also help quickly identify locations in the hospital and agents where stewardship programs can focus.

SAAR Analysis within a Given Facility



Key Point About the SAAR

- The SAAR only helps direct stewardship efforts to locations and antibiotics where use appears to deviate from predicted.
 - High use might be perfectly justified, low use might be harming patients.

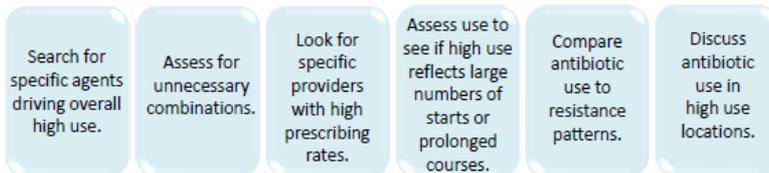
Using the SAAR to Inform Investigations and Interventions

- CDC and The Pew Charitable Trusts partnered with stewardship experts to design an assessment tool that can assist explorations of high SAAR values (or other measures of high use).
- The tool identifies high-yield opportunities to improve use, based on past experience.

SAAR or other indicators of antibiotic use show higher than expected values



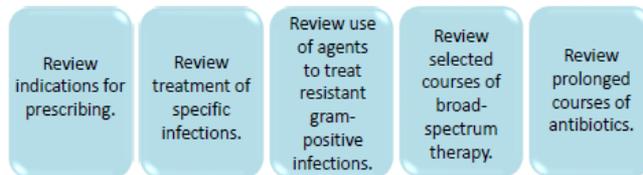
General Assessments



Narrow investigation targets Medication use evaluations



Detailed Reviews



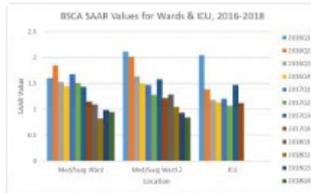
Stewardship Actions



NHSN AU Case Examples

- Community Hospital uses SAARs to reduce Fluoroquinolone use

AU Option Case Examples



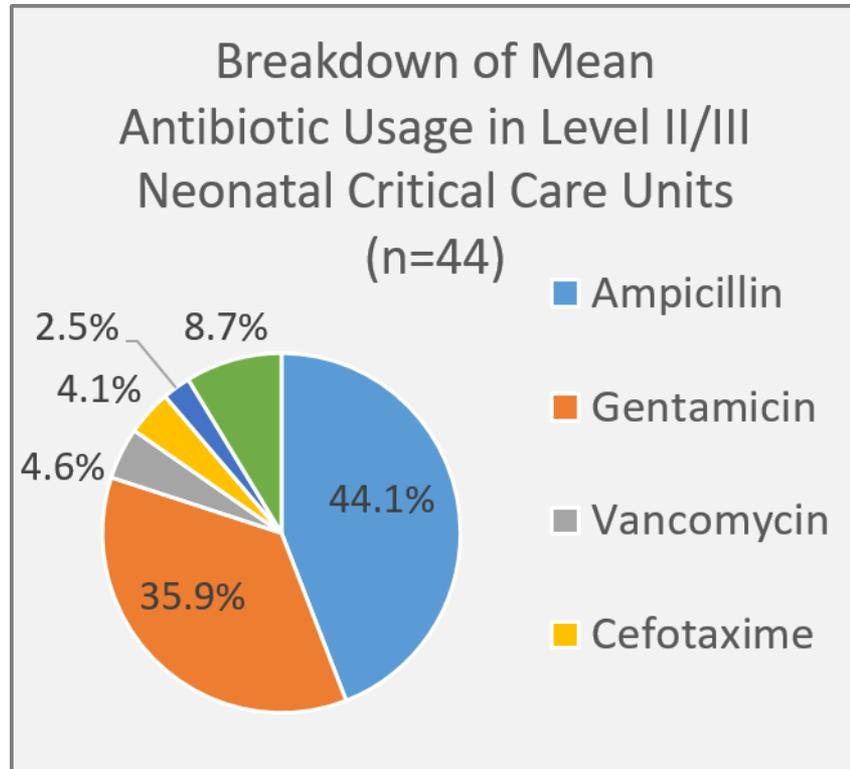
Targeting a Reduction in Fluoroquinolone Use within a Community Hospital

Submitting data into the NHSN Antimicrobial Use (AU Option) since 2016, Wilson Medical Center, a community hospital in North Carolina, used AU Option data to identify an area of high fluoroquinolone use. Once the area of high use and hospital locations were pinpointed, they developed an intervention to address the issue. [Read More.](#)

Posted On: January 30, 2019

- Plan to add additional examples in the coming months

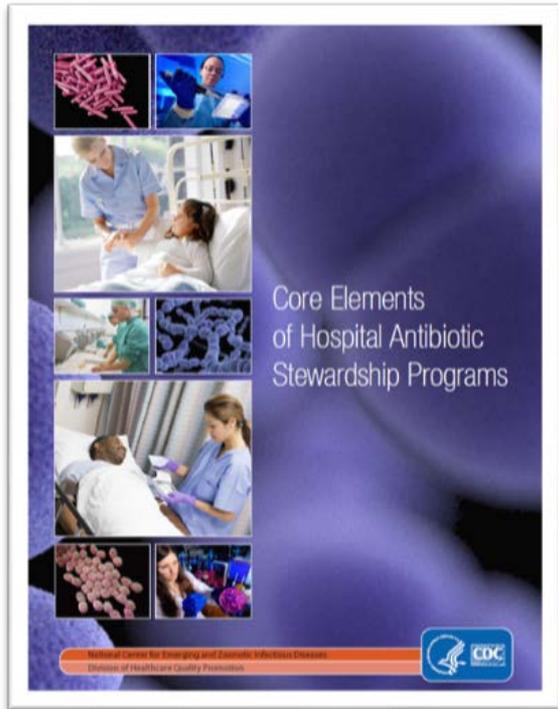
Development of SAARs for Newborn Stewardship



- Working with experts in neonatology and infectious diseases through Vermont Oxford Network
 - Neonatal SAAR categories
 - NHSN survey questions to capture facility-level information potentially necessary for predictive modeling

Implementation

Core Elements of Hospital Antibiotic Stewardship Programs



- Leadership Commitment
- Accountability
- Drug expertise
- Action to improve use
- Tracking
- Reporting
- Education

Core Contributors to Stewardship Programs (in addition to physicians and pharmacists)

Infection Preventionists

- Risk assessment and prevention planning skills
- Collect, analyze and report antibiotic -related data

Laboratory

- Input into specimen collection and proper use of relevant tests
- Review information flow of results to clinicians
- Create and interpret a facility antibiotic resistance report

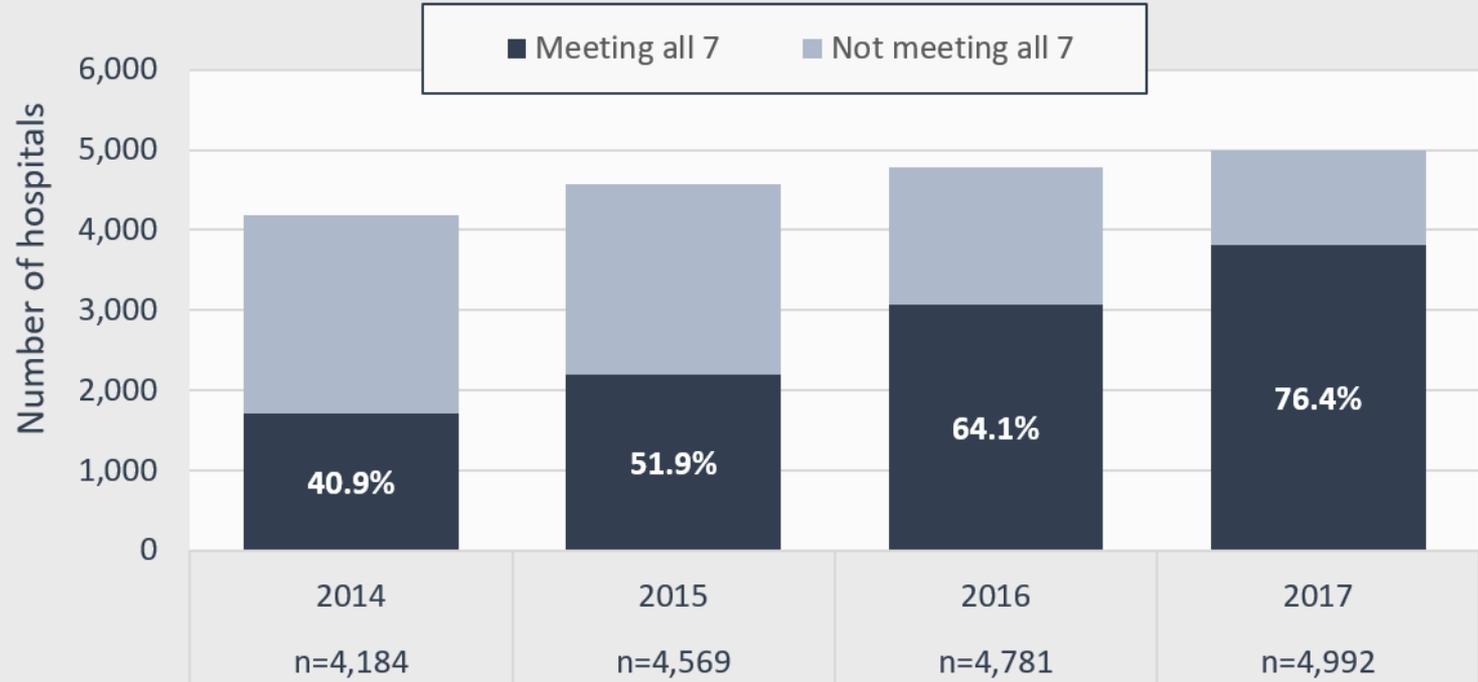
Nursing

- Review medications as part of their routine duties
- Could contribute through prompting discussions of antibiotic treatment, indication, and duration

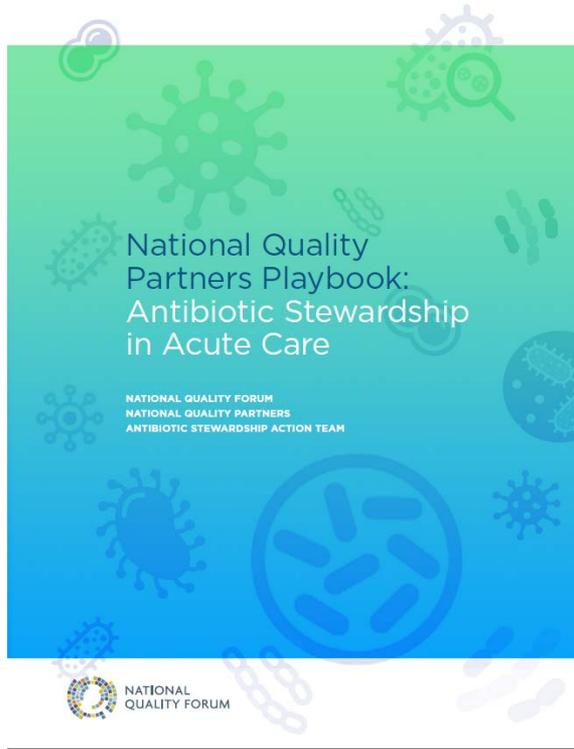
Information Technology (IT)

- Create ways integrate guidelines and policies with decision support at point of care
- Track antibiotic use through medication administration records

NHSN Annual Hospital Surveys 2014-2017: Number and percentage of hospitals meeting all 7 Core Elements

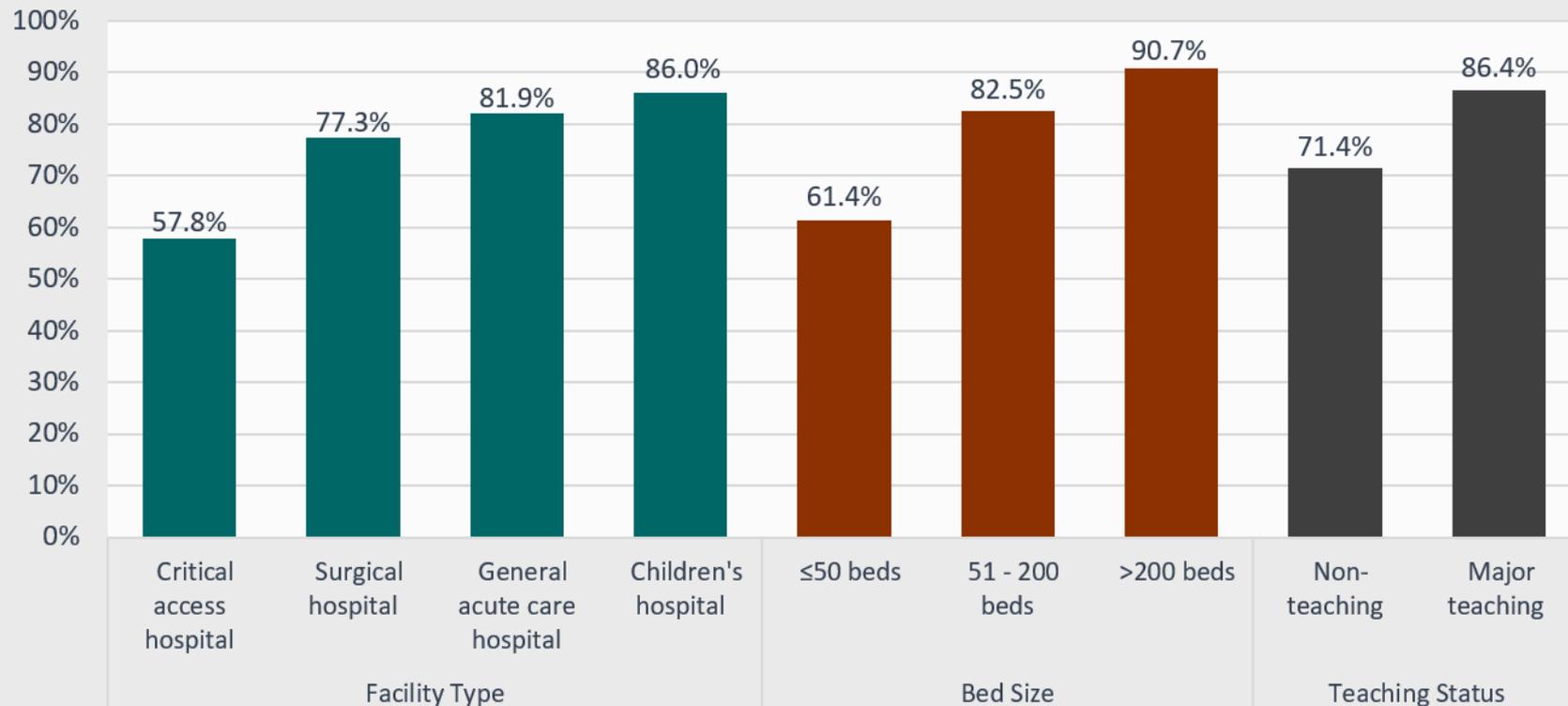


Help with Implementing Core Elements

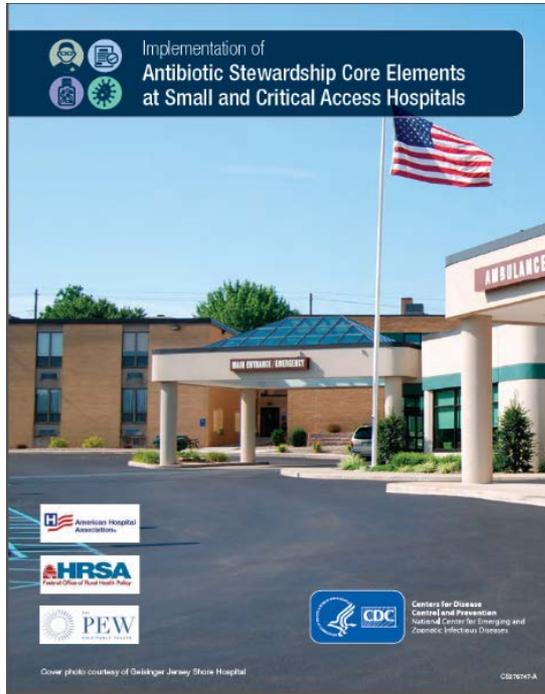


- NQF Hospital Antibiotic Stewardship playbook outlines specific actions that have been taken by other hospitals to implement the CDC Core Elements, barriers and solutions.
- Released in May 2015

Percentage of U.S. acute care hospitals reporting uptake of all 7 CDC Core Elements, 2017 NHSN Annual Hospital Survey, by facility demographic



Implementing Core Elements in Small and Critical Access Hospitals



- Developed in collaboration with: Federal Office of Rural Health Policy, The American Hospital Association, The Pew Charitable Trusts

Improve the Measurement of Implementation of Hospital Stewardship Programs

- The NHSN annual facility survey stewardship questions present an important opportunity to advance our understanding of program implementation.
- Now that the majority of hospitals have the basics, we revised the survey to try and go deeper.
 - More details on program structure and support
 - What specific actions and practices are hospitals implementing?
- CDC sought input from the stewardship community

Antimicrobial Stewardship Programs

- Ultimately, improving antibiotic use comes down to implementing interventions that will improve prescribing.
- The goal of a stewardship program is to create an environment where improvement interventions will be most successful.

Key Moments for Antibiotic Stewardship to Act

- Patients with *C. difficile*
- Patients with positive blood cultures
- Patients being given IV antibiotics at discharge
- Patients on unnecessarily duplicative therapy
- Patients being treated for:
 - Community acquired pneumonia (CAP)
 - Urinary tract infection (UTI)
 - Skin and soft tissue infections
- Patients who have gotten 3 days of therapy.

Innovation - Examples on Advancing SAAR Measure

Advancing the SAAR Measure

- The Duke Antimicrobial Stewardship Outreach Network (DASON) was awarded funding to enroll a group of hospitals in NHSN AU option and then implement and/or expand stewardship efforts.
 - Does the AU rates and/or SAAR change in response to stewardship?
- VA Salt Lake City was awarded funding to electronically assess appropriateness and correlate with SAARs across VA facilities.

Advancing the SAAR Measure

- Duke University was awarded funding to identify patient- and facility-level factors predictive of antimicrobial use that can be used in risk adjustment strategies for benchmarking antimicrobial use.
- Oregon State University/Oregon Health & Science University College of Pharmacy in collaboration with Virginia Commonwealth University School of Pharmacy for advancing data visualizations for AU and SAARs.

Education

CDC Training on Antibiotic Stewardship

- Focused on outpatient antibiotic prescribing and aimed at frontline providers with the objective to:
 - Optimize antibiotic prescribing
 - Inform healthcare professionals about proper antibiotic use
 - Encourage open discussion among clinicians and patients
- Fulfills Improvement Activities Patient Safety and Practice Assessment (PSPA_23 and PSPA_24) under CMS's Merit-Based Incentive Payment Program (MIPS)

https://www.train.org/cdctrain/training_plan/3697



New CDC Training on Antibiotic Stewardship

Objectives:

- Optimize antibiotic prescribing and use to protect patients and combat the threat of antibiotic resistance.
- Inform healthcare professionals about proper antibiotic use.
- Encourage open discussion among physicians and patients.

Up to 8 hours of free CE:

- Multiple online modules offered in 4 sections to be released throughout 2018.*
- Physicians, nurse practitioners, physician assistants, certified health education specialists, nurses, pharmacists, and public health practitioners with an MPH are eligible.
- Fulfills Improvement Activities Patient Safety and Practice Assessment (PSPA_23 and PSPA_24) under the Centers for Medicare & Medicaid Services Merit-Based Incentive Programs, or MIPS.

Register:

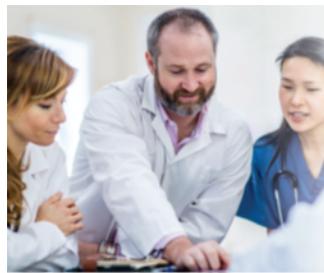
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 U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

 **BE ANTIBIOTICS AWARE**
SMART USE. BEST CARE.

*Additional modules coming Fall 2018

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5 5 WAYS HOSPITAL PHARMACISTS CAN BE ANTIBIOTICS AWARE



Verify Penicillin Allergy



Avoid Duplicative Anaerobic Coverage



De-escalate Anti-MRSA Coverage



Avoid Treatment of ASB



Limit Antibiotic Duration

Engage all hospital pharmacists in stewardship

- Webinar held in Nov 2018

- Available for on-line in Spring 2019

Mark your Calendar!



**BE
ANTIBIOTICS
AWARE**

SMART USE, BEST CARE

**U.S. ANTIBIOTIC
AWARENESS WEEK**

November 18–24, 2019

www.cdc.gov/antibiotic-use

Be Antibiotics Aware Materials

Materials for healthcare providers and consumers include:

- Fact sheets
- Posters
- Brochure
- Video, radio, and print public service announcements (PSAs)
- Shareable GIFs and graphics
- Animated video

These materials are located on CDC's website:

<https://www.cdc.gov/antibiotic-use/community/materials-references/index.html>

Viruses or Bacteria What's got you sick?

Antibiotics are only needed for treating certain infections caused by bacteria. Viral illnesses cannot be treated with antibiotics. When an antibiotic is not prescribed, ask your healthcare professional for tips on how to relieve symptoms and feel better.

Common Condition	Common Cause		Are Antibiotics Needed?
	Bacteria	Virus	
Cold/Flu		Yes	No
Whooping cough	✓		Yes
Urinary tract infection	✓		Yes
Strep infections	✓		Yes
Phlegm or mucus		✓	Maybe
Reconstructed cold or other viral respiratory illness in children and adults*	✓		No
Common viral respiratory illness	✓		No
Some Bacterial (bacterial) meningitis	✓		Yes
Flu		✓	No

*To learn more about common viral illnesses and antibiotics, visit www.cdc.gov/antibiotic-use.

DO YOU NEED ANTIBIOTICS?

BE ANTIBIOTICS AWARE

Why does taking antibiotics lead to antibiotic resistance?

8 WAYS TO BE ANTIBIOTICS AWARE

1. Antibiotics are only used to fight bacterial infections.
2. Antibiotics do not work on viruses.
3. An antibiotic will not make you feel better if you have a viral infection.
4. An antibiotic will not make you feel better if you have a cold.
5. Any time antibiotics are used, they can cause side effects.
6. Taking an antibiotic when you don't need it can cause antibiotic resistance.
7. If you need antibiotics, take them exactly as prescribed.
8. Stay healthy: clean hands, cover coughs, and get vaccinated for the flu.

To learn more about antibiotic prescribing, visit www.cdc.gov/antibiotic-use.

Antibiotics Aren't Always the Answer.

What is the right way to take antibiotics?

What are the side effects?

Each year in the United States, at least 2 million people get infected with antibiotic-resistant bacteria. At least 23,000 people die as a result.

IMPROVING ANTIBIOTIC USE

Do I really need antibiotics?

Do antibiotics have side effects?

1 out of 5 need to be cautious about antibiotics.

Symptom Relief for Viral Illnesses

1. DIAGNOSIS

2. GENERAL INSTRUCTIONS

3. SPECIFIC MEDICINES

4. FOLLOW UP

ANTIBIOTICS AREN'T ALWAYS THE ANSWER

The Facts:

BE ANTIBIOTICS AWARE

AN ANTIBIOTIC IS THE WRONG TOOL TO TREAT A VIRUS.

Make sure you use the right tool for the job.

BE ANTIBIOTICS AWARE

Conclusions

- Antibiotics are commonly used and misused in hospitals.
- Improving antibiotic use is an important public health priority and a healthcare quality and patient safety issue.
- CDC's approach in improving antibiotic uses focuses on data for action, implementation, innovation and education.