



Hot Topics in Antimicrobial Stewardship

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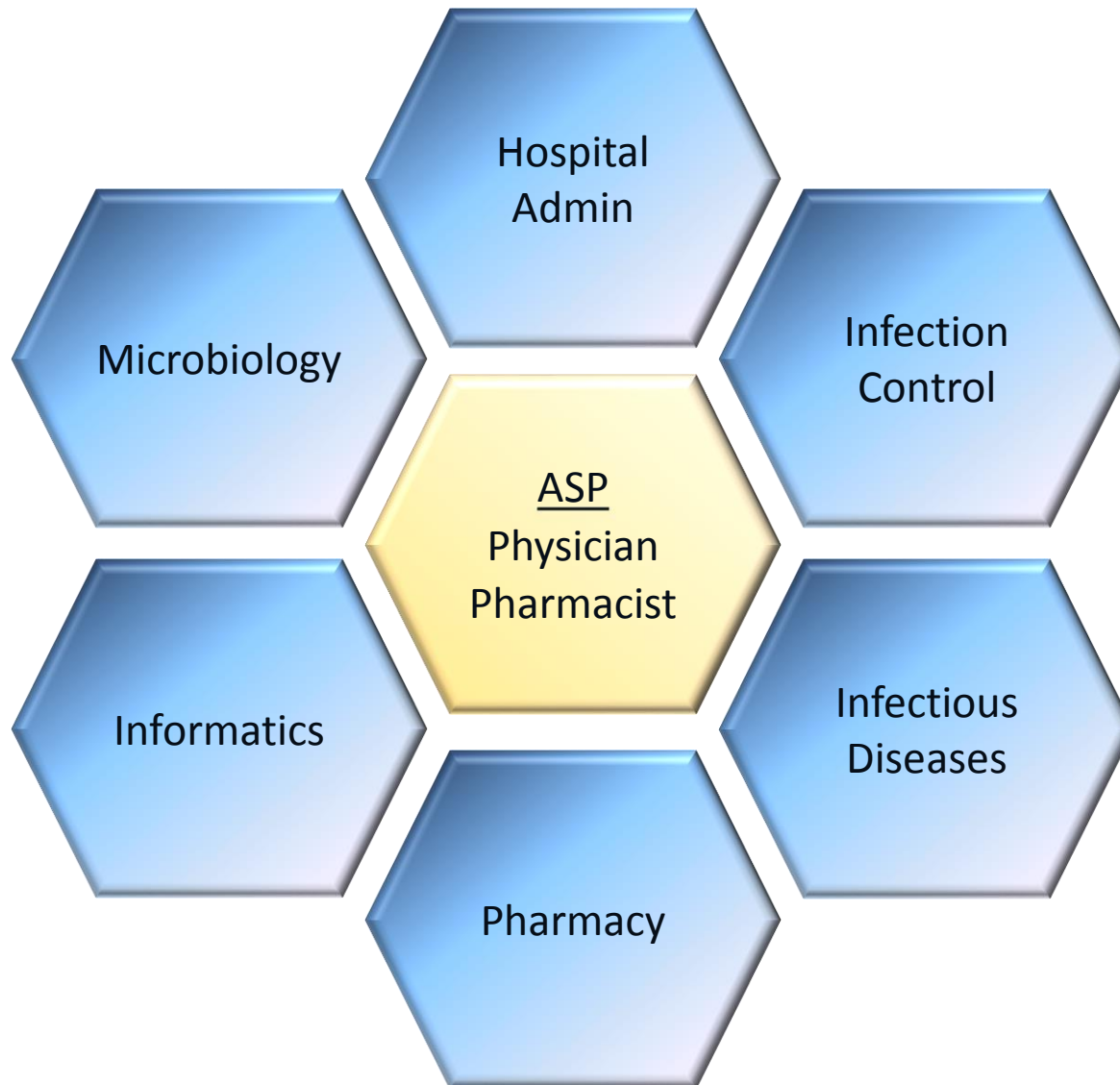
Antimicrobial Stewardship Goals



- Primary Goal
 - Optimize clinical outcomes while minimizing the unintended consequences of antimicrobial use

- Secondary Goals
 - Reduce antimicrobial resistance
 - Reduce mortality and length of stay
 - Reduce associated healthcare costs

Antimicrobial Stewardship Team





UNMH Antimicrobial Stewardship Program
Mission Statement

To Preserve the *Miracle* of Antibiotics for All

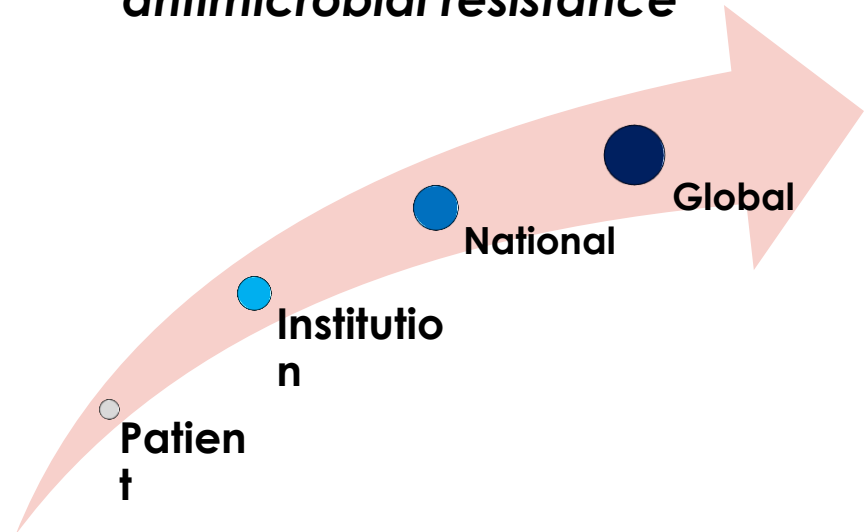
ASP Interventions

ASP Activities

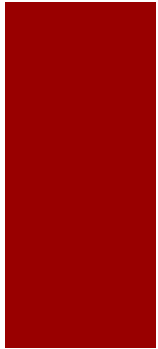
- Patient Centered
 - Prospective audit and review
 - Formulary management
 - Identify patients who may benefit from ID consult
- Institutional
 - AntibioGrams
 - Clinical pathways
 - Dose optimization

Impact of Interventions

Goal: Decrease or slow antimicrobial resistance



CDC Core Elements of ASP – Hospital-Based



Checklist for Core Hospital Antibiotic

The following checklist is a comp...
This checklist should be used to...
antibiotic prescribing and limit o...
all hospitals implement an Antibi...

Facilities using this checklist sho...
following principles and actions t...
have been shown in previous stu...
elements might be feasible in all

LEADERSHIP SUPPORT

- A. Does your facility have a formal, w...
efforts to improve antibiotic use (a...
- B. Does your facility receive any bud...
(e.g., support for salary, training, o...

ACCOUNTABILITY

- A. Is there a physician leader respo...
facility?

DRUG EXPERTISE

- A. Is there a pharmacist leader respo...

KEY SUPPORT FOR THE ANTIBIOTIC STE...

Does any of the staff below work

- B. Clinicians
- C. Infection Prevention and Healthca...
- D. Quality Improvement
- E. Microbiology (Laboratory)
- F. Information Technology (IT)
- G. Nursing

ACTIONS TO SUPPORT OPTIMAL ANTIBIOTIC USE

POLICIES

- A. Does your facility have a policy that requires prescribers...
during order entry a dose, duration, and indication for a...
- B. Does your facility have facility-specific treatment recom...
and local susceptibility, to assist with antibiotic selectio...

SPECIFIC INTERVENTIONS TO IMPROVE ANTIBIOTIC USE

Are the following actions to improve antibiotic pres...

BROAD INTERVENTIONS

- C. Is there a formal procedure for all clinicians to review th...
hours after the initial orders (e.g., antibiotic time out)?
- D. Do specified antibiotic agents need to be approved by a...
dispensing (e.g., pre-authorization) at your facility?
- E. Does a physician or pharmacist review courses of these...
prospective audit with feedback) at your facility?

PHARMACY-DRIVEN INTERVENTIONS

Are the following actions implemented in your fac...

- F. Automatic changes from intravenous to oral antibiotic th...
- G. Dose adjustments in cases of organ dysfunction?
- H. Dose optimization (pharmacokinetics/pharmacodynami...
organisms with reduced susceptibility?
- I. Automatic alerts in situations where therapy might be ut...
- J. Time-sensitive automatic stop orders for specified anti...

DIAGNOSIS AND INFECTIONS SPECIFIC INTERVENTIONS

Does your facility have specific interventions in pla...
antibiotics to treat the following common infection...

- K. Community-acquired pneumonia
- L. Urinary tract infection
- M. Skin and soft tissue infections
- N. Surgical prophylaxis
- O. Empiric treatment of Methicillin-resistant Staphylococ...

R. Non-C, Difficile infection (CDI) antibiotics in new cases of CDI Yes No

Q. Culture-proven invasive (e.g., blood stream) infections Yes No

TRACKING: MONITORING ANTIBIOTIC PRESCRIBING, USE, AND RESISTANCE

PROCESS MEASURES

- A. Does your stewardship program monitor adherence to a documentation policy (dose, duration, and indication)? Yes No
- B. Does your stewardship program monitor adherence to facility-specific treatment recommendations? Yes No
- C. Does your stewardship program monitor compliance with one of more of the specific interventions in place? Yes No

ANTIBIOTIC USE AND OUTCOME MEASURES

- D. Does your facility track rates of C, difficile infection? Yes No
- E. Does your facility produce an antibiogram (cumulative antibiotic susceptibility report)? Yes No

Does your facility monitor antibiotic use (consumption) at the unit and/or facility wide level by one of the following metrics:

- F. By counts of antibiotic(s) administered to patients per day (Days of Therapy; DOT)? Yes No
- G. By number of grams of antibiotics used (Defined Daily Dose, DDD)? Yes No
- H. By direct expenditure for antibiotics (purchasing costs)? Yes No

REPORTING INFORMATION TO STAFF ON IMPROVING ANTIBIOTIC USE AND RESISTANCE

- A. Does your stewardship program share facility-specific reports on antibiotic use with prescribers? Yes No
- B. Has a current antibiogram been distributed to prescribers at your facility? Yes No
- C. Do prescribers ever receive direct, personalized communication about how they can improve their antibiotic prescribing? Yes No

EDUCATION

- A. Does your stewardship program provide education to clinicians and other relevant staff on improving antibiotic prescribing? Yes No

CDC's Core Elements for ASPs



- ✓ Obtain leadership commitment
 - Includes dedicating necessary human, financial and information technology resources
- ✓ Appoint a single leader responsible for program outcomes
- ✓ Appoint a single pharmacist leader responsible for working to improve antibiotic use
- ✓ Obtain support from key stakeholder
 - Infection control and prevention
 - Information technology
 - Quality improvement
 - Clinicians

CDC's Core Elements for ASPs (cont.)

- ✓ Implement policies and interventions to improve antibiotic use
- ✓ Evaluate ongoing treatment need after an initial treatment period
 - E.g. “Antibiotic timeout” after 48 hours
- ✓ Monitor antibiotic prescribing and resistance patterns
- ✓ Regularly report information on antibiotic use and resistance to doctors, nurses, and relevant staff
- ✓ Educate clinicians about resistance and optimal prescribing



NHSN Annual Facility Survey – Antimicrobial Stewardship (2015)

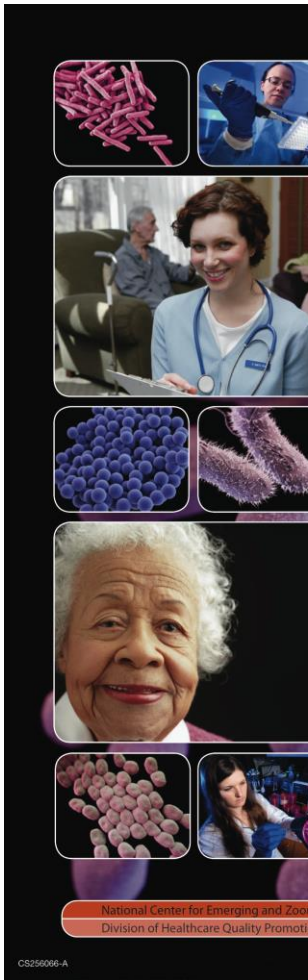


Element	Number	%
Leadership	2,457	60.1
Accountability	2,949	72.1
Drug Expertise	3,566	87.2
Act	3,844	94.0
Track	3,211	78.5
Report	2,767	67.6
Educate	2,827	69.1

42.5% of Hospitals had all 7 elements

Data from A. Srinivasan (Slide, SHEA Conference 2015)

CDC Core Elements of ASP – Nursing Homes



Checklist for Stewardship

The following checklist is a companion to the CDC Core Elements of Antibiotic Stewardship for Nursing Homes. Before getting started, use this checklist to review your facility's current practices (at least annually). Over time, implement activities to improve your facility's practices.

LEADERSHIP SUPPORT

1. Can your facility demonstrate leadership support for antibiotic stewardship through the following actions?

- If yes, indicate which of the following are in place (select all that apply):
- Written statement of leadership support
 - Antibiotic stewardship duties included in job descriptions
 - Antibiotic stewardship duties included in performance evaluations
 - Leadership monitors whether antibiotic stewardship activities are being implemented
 - Antibiotic use and resistance data is reviewed

ACCOUNTABILITY

2. Has your facility identified a lead(s) for antibiotic stewardship?

- If yes, indicate who is accountable for stewardship activities:
- Medical director
 - Director or assistant director of nursing
 - Consultant pharmacist
 - Other: _____

DRUG EXPERTISE

3. Does your facility have access to individualized antibiotic stewardship services?

- If yes, indicate who is accountable for stewardship activities:
- Consultant pharmacy has staff trained in antibiotic stewardship
 - Partnering with stewardship team at referring facility
 - External infectious disease/stewardship consultant
 - Other: _____

ACTIONS TO IMPROVE USE

4. Does your facility have policies to improve antibiotic prescribing practices?

- If yes, indicate which policies are in place (select all that apply):
- Requires prescribers to document a diagnosis for each prescription
 - Developed facility-specific algorithm for antibiotic prescribing
 - Developed facility-specific algorithms for antibiotic prescribing (e.g., for specific infections)
 - Developed facility-specific treatment recommendations
 - Reviews antibiotic agents listed on the formulary
 - Other: _____

5. Has your facility implemented practices to improve antibiotic use? Yes No

If yes, indicate which practices are in place (select all that apply):

- Utilizes a standard assessment and communication tool for residents suspected of having an infection
 - Implemented process for communicating or receiving antibiotic use information when residents are transferred to/from other healthcare facilities
 - Developed reports summarizing the antibiotic susceptibility patterns (e.g., facility antibiogram)
 - Implemented an antibiotic review process/“antibiotic time out”
 - Implemented an infection specific intervention to improve antibiotic use
- Indicate for which condition(s): _____

6. Does your consultant pharmacist support antibiotic stewardship activities? Yes No

If yes, indicate activities performed by the consultant pharmacist (select all that apply):

- Reviews antibiotic courses for appropriateness of administration and/or indication
- Establishes standards for clinical/laboratory monitoring for adverse drug events from antibiotic use
- Reviews microbiology culture data to assess and guide antibiotic selection

TRACKING: MONITORING ANTIBIOTIC PRESCRIBING, USE, AND RESISTANCE

7. Does your facility monitor one or more measures of antibiotic use? Yes No

If yes, indicate which of the following are being tracked (select all that apply):

- Adherence to clinical assessment documentation (signs/symptoms, vital signs, physical exam findings)
- Adherence to prescribing documentation (dose, duration, indication)
- Adherence to facility-specific treatment recommendations
- Performs point prevalence surveys of antibiotic use
- Monitors rates of new antibiotic starts/1,000 resident-days
- Monitors antibiotic days of therapy/1,000 resident-days
- Other: _____

8. Does your facility monitor one or more outcomes of antibiotic use? Yes No

If yes, indicate which of the following are being tracked (select all that apply):

- Monitors rates of *C. difficile* infection
- Monitors rates of antibiotic-resistant organisms
- Monitors rates of adverse drug events due to antibiotics
- Other: _____

REPORTING INFORMATION TO STAFF ON IMPROVING ANTIBIOTIC USE AND RESISTANCE

9. Does your facility provide facility-specific reports on antibiotic use and outcomes with clinical providers and nursing staff? Yes No

If yes, indicate which of the following are being tracked (select all that apply):

- Measures of antibiotic use at the facility
- Measures of outcomes related to antibiotic use (i.e., *C. difficile* rates)
- Report of facility antibiotic susceptibility patterns (within last 18 months)
- Personalized feedback on antibiotic prescribing practices (to clinical providers)
- Other: _____

EDUCATION

10. Does your facility provide educational resources and materials about antibiotic resistance and opportunity for improving antibiotic use? Yes No

If yes, indicate which of the following are being tracked (select all that apply):

- Clinical providers (e.g., MDs, NPs, PAs, PharmDs)
- Nursing staff (e.g., RNs, LPNs, CNAs)
- Residents and families
- Other: _____

3-Letter Acronyms

- ASP
- TJC
- CMS



TJC – New Antimicrobial Stewardship Standard



- Issued 6/22/2016
- Effective 1/1/2017
- Medication Management Standard (MM.09.01.01)
- 8 Elements of Performance

TJC's New Antimicrobial Stewardship Standard

- Leadership support
- Education
 - Staff and licensed providers
 - Patients and families
- ASP Team
- Includes core elements
- Use of multidisciplinary protocols for improving ABX use
- Analyzes and report data
- Takes action on improvement activities

The Joint Commission has approved the following revisions for prepublication. While revised requirements are published in the semiannual updates to the print manuals (as well as in the online E-dition[®]), accredited organizations and paid subscribers can also view them in the monthly periodical *The Joint Commission Perspectives*[®]. To begin your subscription, call 877-223-6866 or visit <http://www.jcrinc.com>.



New Antimicrobial Stewardship Standard

APPLICABLE TO HOSPITALS AND CRITICAL ACCESS HOSPITALS

Effective January 1, 2017

Medication Management (MM)

Standard MM.09.01.01

The [critical access] hospital has an antimicrobial stewardship program based on current scientific literature.

Elements of Performance for MM.09.01.01

1. Leaders establish antimicrobial stewardship as an organizational priority. (See also LD.01.03.01, EP 5)

Note: Examples of leadership commitment to an antimicrobial stewardship program are as follows:

- Accountability documents
- Budget plans
- Infection prevention plans
- Performance improvement plans
- Strategic plans
- Using the electronic health record to collect antimicrobial stewardship data

2. The [critical access] hospital educates staff and licensed independent practitioners involved in antimicrobial ordering, dispensing, administration, and monitoring about antimicrobial resistance and antimicrobial stewardship practices. Education occurs upon hire or granting of initial privileges and periodically thereafter, based on organizational need.
3. The [critical access] hospital educates patients, and their families as needed, regarding the appropriate use of antimicrobial medications, including antibiotics. (For more information on patient education, refer to Standard PC.02.03.01)

Note: An example of an educational tool that can be used for patients and families includes the Centers for Disease Control and Prevention's Get Smart document, "Viruses or Bacteria—What's got you sick?" at <http://www.cdc.gov/getsmart/community/downloads/getsmart-chart.pdf>.

4. The [critical access] hospital has an antimicrobial stewardship multidisciplinary team that includes the following members, when available in the setting:
 - Infectious disease physician
 - Infection preventionist(s)
 - Pharmacist(s)
 - Practitioner

Note 1: Part-time or consultant staff are acceptable as members of the antimicrobial stewardship multidisciplinary team.

Note 2: Telehealth staff are acceptable as members of the antimicrobial stewardship multidisciplinary team.
5. © The [critical access] hospital's antimicrobial stewardship program includes the following core elements:
 - Leadership commitment: Dedicating necessary human, financial, and information technology resources.
 - Accountability: Appointing a single leader responsible for program outcomes. Experience with successful programs shows that a physician leader is effective.
 - Drug expertise: Appointing a single pharmacist leader responsible for working to improve antibiotic use.
 - Action: Implementing recommended actions, such as systemic evaluation of ongoing treatment need, after a set period of initial treatment (for example, "antibiotic time out" after 48 hours).
 - Tracking: Monitoring the antimicrobial stewardship program, which may include information on antibiotic prescribing and resistance patterns.

CMS – Conditions of Participation

- Proposed rule change issued in June 2016
- Require hospitals to implement antibiotic stewardship programs to participate in Medicare and Medicaid
- Comment period was over as of 8/15/16



CMS §482.42(b): Antibiotic Stewardship Program Organization and Policies



- Effective January 1, 2017
- Demonstrate coordination among all components of the hospital responsible for antibiotic use and factors that lead to antimicrobial resistance
- Document the evidence-based use of antibiotics in all departments and services of the hospital
- Demonstrate improvements, including sustained improvements in proper antibiotic use

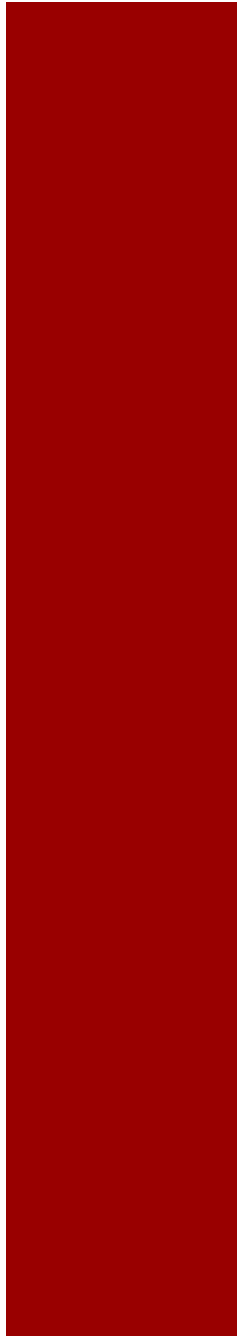
Why ABX Stewardship?

- 30 – 50% of antibiotic use is inappropriate and are likely prolonged and not scaled back
- ASPs have been shown to reduce ABX by almost 20% in inpatient settings
 - Patient safety
 - Drug-resistance
 - Cost
- Data that associates effective ASPs and lower infection rates
- Antibiotic resistance continues to grow
 - 23,000 deaths¹
 - > 2 million infections¹

¹CDC Antibiotic Resistance Threats in the US, 2013

<http://www.cdc.gov/drugresistance/threat-report-2013/index.html>

How Many People Have Heard
about Antibiotic Timeouts?



Antibiotic Timeouts

- All clinicians should perform a review of ABX 48 hrs after ABX should ask:
 1. Does this patient have an infection that will respond to antibiotics?
 2. If so, is the patient on the right antibiotic(s), dose, and route of administration?
 3. Can a more targeted ABX be used to treat the infection (i.e., deescalate)?
 4. How long should the patient receive the antibiotic(s)?

Antibiotic Timeouts – Good in Principle, Hard in Practice



- Teaching hospital
- Evaluated Zosyn and Vancomycin use (broad-spectrum antibiotics)
- Timeout program:
 - Electronic dashboard that aggregated infection-relevant data
 - Note template in EMR that included structured review of ABX indications
 - Educational and social marketing campaign
- Impact
 - Vancomycin was more greatly impacted than Zosyn
 - 64 vs. 48% with vancomycin discontinued by day 5
 - 67 vs. 62% with vancomycin discontinued by day 5
 - Modest level of clinician satisfaction with EMR dashboard and note template

How's Our Antibiotic Prescribing Relative to Everyone Else?



- Newer module in CDC's National Healthcare Safety Network (NHSN) → Antibiotic Use and Resistance Module
- How many people are aware of this? How many people are using this?
- Captures electronic data on ABX administered and admission/discharge/transfer data

CDC NHSN AUR Module



- Calculates rates of use to evaluate current antibiotic use (units or facility-wide), to aggregate data for regional/national data, and to create benchmarks (ABX use measure)
 - Days of therapy per 1000 patient days present
 - Split by locations (adult vs. peds, ICU vs. ward)
 - Current agent categories: broad spectrum gram neg agents (community vs. hospital acquired), anti-MRSA agents, all ABX
 - Developing a standardized antibiotic administration ratio (SAAR)
- As of 2015, roughly 100 facilities were submitting data
- **Caveat:** Need structured data from clinical decision support systems

Is Rapid Diagnostic Testing Enough?



- Often times, no...
- So interventions need to be paired with stewardship activities
- Challenge: many disease entities do not have rapid diagnostics to rule out infections or reliability is not sufficient
 - ICU settings
 - Inpatient floor
 - Ambulatory care

Stewardship Training Programs

Making a Difference in Infectious Diseases (MAD-ID)

- Basic program
- Advanced program
- 19 contact hours (1.9 CEUs) each
- <http://mad-id.org/antimicrobial-stewardship-programs>,



Society of Infectious Disease Pharmacists (SIDP)

- Partnered with ProCE
 - info@proce.com
- Offers up to 43 contact hours (4.3 CEUs)
- <http://www.sidp.org/Stewardship-Program>



SOCIETY OF INFECTIOUS
DISEASES PHARMACISTS

Additional Resources

- STEWARDSHIP-EDUCATION.org
 - Collaborative project between SHEA, IDSA, PIDS, NFID, MAD-ID, SIDP, and ASHP
- APIC's Stewardship Toolkit
 - <http://www.apic.org/Professional-Practice/Practice-Resources/Antimicrobial-Stewardship>
- CDC's Get Smart Campaign
 - <http://www.cdc.gov/getsmart/>
 - Checklist for Core Elements of Hospital Antibiotic Stewardship Programs





Support Antimicrobial Stewardship

Be a Microbiome Defender!