Practical Application & Implementation of The Core Elements of Hospital Antibiotic Stewardship Programs

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Learning Objectives

- Discuss Antimicrobial Stewardship and the importance of Antimicrobial Stewardship Programs (ASP)
- Examine the Joint Commission Antimicrobial Stewardship Requirements for Hospitals, including the Proposed Revisions for Hospital Accreditation, as well as the Centers for Disease Prevention Core Elements of Hospital Antibiotic Stewardship
- Integrate examples and recommendations to meet TJC requirements in a limited resources practice site(s)

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What is Antimicrobial Stewardship?

“Systematic measurement and coordinated interventions designed to promote the optimal use of antibiotic agents, including their choice, dosing, route, and duration of administration.”

What is an Antimicrobial Stewardship Program (ASP)?

- An ASP is a collaborative, multidisciplinary committee led by physicians, pharmacists, or both with the common goal of improving patient outcomes by combating antimicrobial resistance and reducing the spread of multi-drug resistant organisms through appropriate antibiotic use
- ASPs are vital to ensure their respective sites are meeting antimicrobial stewardship requirements for The Joint Commission accreditation

Current Guidance

CDC

- The Core Elements of Hospital Antibiotic Stewardship Programs (2019)[2]
- The Core Elements of Human Antibiotic Stewardship Programs in Resource-Limited Settings: National and Hospital Levels (2018)[3]

National Quality Forum

- Antibiotic Stewardship in Acute Care: A Practical Playbook (2016)[4]

White House

- National Action Plan for Combating Antibiotic-Resistant Bacteria 2020-2025 (2020)[5]

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Why Are ASPs Needed?

2014 CDC encouraged all hospitals to develop ASPs and published the first Core Elements of Hospital Antibiotic Stewardship Programs

2015 The United States National Action Plan for Combating Antibiotic Resistant Bacteria set a goal for implementation of the Core Elements in all hospitals that receive federal funding

2017 TJC set Medication Management Standard MM.09.01.01, an ASP requirement that aims to determine whether facilities are meeting the eight required elements of performance

2019 CMS set a federal regulation for hospital ASPs, referencing the CDC's Core Elements, for all hospitals that receive federal funding

Why Are ASPs Needed?

Requirement of TJC first effective January 1st, 2017

- Standard MM.09.01.01 (2017)[6]
  1. **Leaders** establish antimicrobial stewardship as an organizational priority.
  2. The hospital **educates** staff and licensed independent practitioners involved in antimicrobial ordering, dispensing, administration, and monitoring about antimicrobial resistance and antimicrobial stewardship practices
  3. The hospital **educates** patients, and their families as needed, regarding the appropriate use of antimicrobial medications, including antibiotics
  4. The hospital has an **antimicrobial stewardship multidisciplinary team** that includes the following members, when available: ID physician, infection preventionist, pharmacist, and practitioner

Why Are ASPs Needed?

5. The hospital's ASP includes the following core elements:
    a. *Leadership commitment*
    b. *Accountability*
    c. *Drug expertise*
    d. *Action*
    e. *Tracking*
    f. *Reporting*
    g. *Education*
6. The hospital's ASP uses organization-approved multidisciplinary protocols
7. The hospital collects, analyzes, and reports data on its antimicrobial stewardship program
8. The hospital takes action on improvement opportunities identified in its antimicrobial stewardship program

Why Are ASPs Needed?

Requirement of CMS

- Condition of Participation - §482.42 and §485.640 (2019)[7]
  - Hospitals MUST:
    - Have active and hospital-wide infection prevention and control programs for surveillance, prevention, and control of healthcare-associated and other infections
    - Have active and facility-wide ASPs to help reduce inappropriate antibiotic use and antimicrobial resistance.
    - Designate qualified leaders in these facilities to guide and oversee these efforts
    - Adhere to nationally recognized guidelines, as well as best practices, for improving antibiotic use

Benefit of ASPs

Improved patient outcomes by reducing:

- Rates of treatment failure [10]
- Rates of C. difficile infections [9]
- Adverse effects
- Antibiotic resistance [8, 9, 10]
- Hospital costs [8]
- Length of stay [8]

Core Elements

Core Elements of Hospital Antibiotic Stewardship Programs

Hospital Leadership Commitment
Dedicate necessary human, financial, and information technology resources.

Accountability
Appoint a leader or co-leaders, such as a physician and pharmacist, responsible for program management and outcomes.

Pharmacy Expertise (previously "Drug Expertise"):
Appoint a pharmacist, ideally as the co-leader of the stewardship program, to help lead implementation efforts to improve antibiotic use.

Action
Implement interventions, such as prospective audit and feedback or preauthorization, to improve antibiotic use.

Tracking
Monitor antibiotic prescribing, impact of interventions, and other important outcomes, like *C. difficile* infections and resistance patterns.

Reporting
Regularly report information on antibiotic use and resistance to prescribers, pharmacists, nurses, and hospital leadership.

Education
Educate prescribers, pharmacists, nurses, and patients about adverse reactions from antibiotics, antibiotic resistance, and optimal prescribing.

Core Elements

The TJC does not specifically require the core elements to be applied in any specific way, so facilities may use and modify the suggestions to implement each core element to the facility

Hospital Leadership Commitment

Dedicate necessary human, financial and information technology resources to the ASP [4]

- Formal displays of support for ASP
  - Support from Chief Medical Officer, Chief Nurse Officer, Director of Pharmacy, P&T Committee, laboratory, IT staff, and Department/Program Heads
  - Formal, board-approved statement of support
  - Regular communication in newsletters/emails on the commitment to antimicrobial stewardship
  - Designate a hospital executive to serve as an ASP champion
- Financial and staffing support
  - To complete training and education
  - To ensure the continued functioning of the ASP
  - Salary support and dedicated time in the job descriptions of ASP leaders with defined responsibilities
- Strategies and Action Plans
  - Develop clear targets and goals for ASP
  - Include ASP outcome measures in reports to hospital leadership
  - Ensure necessary support from lab, IT, nurses, and QI staff
  - Hold providers accountable for improving antibiotic use
  - Include antimicrobial stewardship training in ongoing education and competency trainings

Hospital Leadership Commitment

Sample Letter to Providers: Communicate Antibiotic Stewardship Priorities

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USE THIS TEMPLATE TO DEVELOP YOUR OWN FACILITY LETTER

TO: [Relevant staff, associated providers]
FROM: [Medical Director and Antimicrobial Stewardship Program staff, as appropriate]
RE: [Antibiotic Stewardship Program Policy and Procedures]
DATE: [Date]

Dear Prescriber,

This letter is written to inform you of our facility's commitment to antibiotic stewardship. Antibiotics are important tools and are among the most commonly prescribed pharmaceuticals in long-term care settings. However, research has shown that a high proportion of antibiotic prescriptions are unnecessary or inappropriately prescribed.[1] To improve resident outcomes and reduce resistance, and in response to requirements from CMS (Centers for Medicare & Medicaid Services), [NAME OF FACILITY] has implemented an antibiotic stewardship program (ASP). Please review [NAME OF FACILITY's] AS policy attached. **We are asking you to commit to AS by supporting these current activities:**

[EXAMPLE 1] Prescription record keeping.

Accountability

Appoint a leader or co-leaders, such as a physician and pharmacist, responsible for program management and outcomes. They should have clearly delineated roles, expectations, and responsibilities. [4]

ASP Leaders should:

- Be held accountable for ASP outcome measures (ie performance evaluations, performance-based contracts)
- Actively engage other departments in ASP efforts
- Complete necessary antimicrobial stewardship training and education
- Provide ASP feedback and reports to leadership
- Establish a policy that defines ASP non-compliance and what the corrective actions will be
- Ensure ASP representatives are integrated into each silo of care

Accountability

Team member	Activities this member is accountable for	Estimation of weekly hours	What needs are to be met for this person to serve as an ASP team member?
Medical Director			
Pharmacist			
Nurse leader			
Infection preventionist			
Microbiologist			

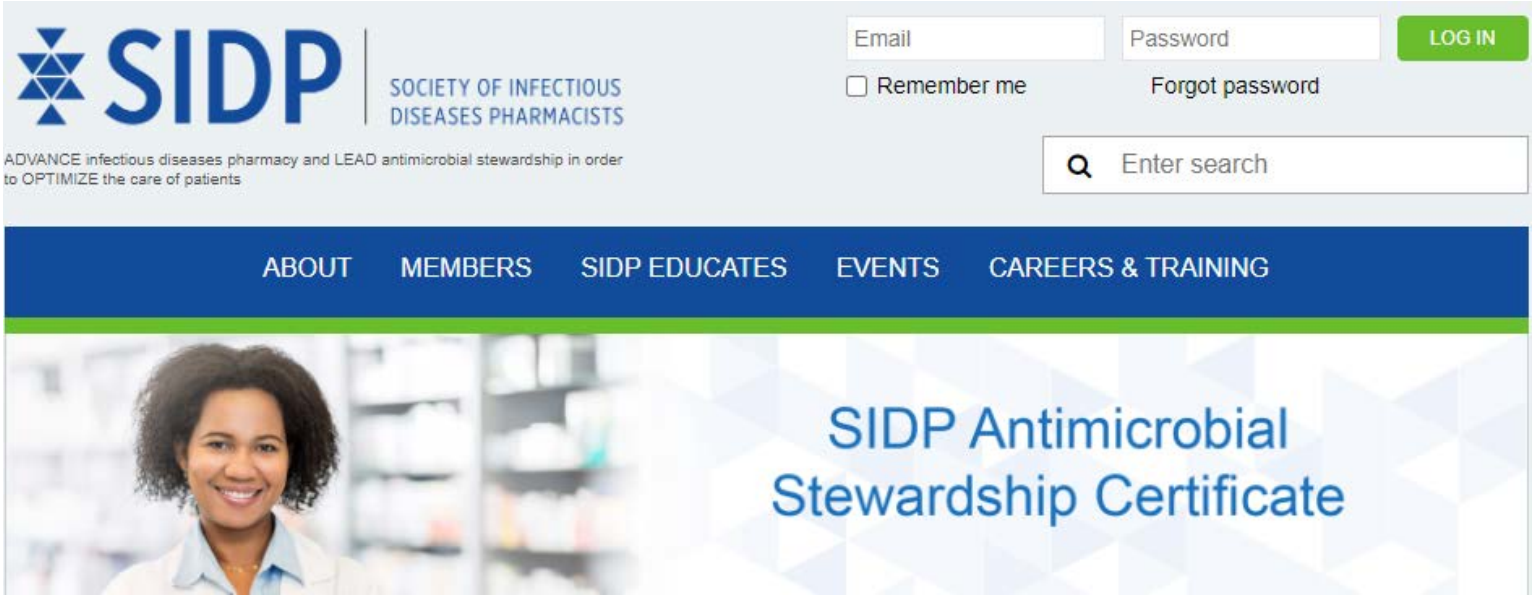
Example of documentation of roles, responsibilities, and time expectations [12]

Pharmacy Expertise

Appoint a pharmacist, ideally as the co-leader of the stewardship program, to lead implementation efforts to improve antibiotic use. Pharmacy leader would ideally have expertise in or postgraduate training in infectious disease. [4]

- Pharmacy leader should complete continued education or training in antibiotic stewardship as applicable.
- Pharmacy leader should engage and train other pharmacy staff

Pharmacy Expertise



Example of Antimicrobial Stewardship Certificate from SIDP [13]

Action

Implement interventions to improve antibiotic use, focusing on 1-3 SMART activities at a time. [4]

- Priority Interventions
  - Prospective audit & feedback (aka post-prescription review)
  - Preauthorization
- Infection-Based Interventions
  - Develop facility-specific treatment guidelines/protocols for CAP, UTI, SSTI, sepsis, staph infections, MRSA, C. difficile, culture-proven invasive infections, IAI, sepsis, and outpatient parenteral antibiotic therapy (OPAT)
    - One of the most effective ASP interventions in a large survey
    - Should include local susceptibilities, formulary options, diagnostic approaches, laboratory testing protocol, indications for rapid diagnostics/imaging, when to de-escalate or stop treatment, and recommended treatment durations
      - Consider linking these to order sets and clinical pathways
- Provider-Based Interventions
  - Antibiotic timeouts after 48-72h
  - Assessing PCN allergy
- Pharmacy Interventions
  - Document indications for antibiotics
  - Transition IV to PO
  - Dose adjustments and optimization
  - Detect and prevent DDIs
- Microbiology-Based Interventions
  - Tailor susceptibility reports to show antibiotics consistent with facility-specific treatment guidelines
- Nursing-Based Interventions
  - Prompt discussions when to transition patients IV to PO and when to review antibiotic use

Action


Antibiotic Stewardship Interventions
Forumulary restriction & pre-authorization
Combo therapy IV to PO
Combo therapy
Pharmacy Interventions
Detect & prevent abx ADEs
Indication doc.
Time-sens. stop orders
Dose optimization
Duplicative therapy alerts
Education
Patient
Nursing
Prescribers
Pharmacy
Admin.
Provider Interventions
Antibiotic time-out
Diagnostic stewardship
Penicillin allergy assessments
IT
Clinical decision pathways
Audit & Feedback
Microbiologic Interventions
Antibiogram
Report comments
Guidelines
UTI
CDI
CAP
HAP
MRSA
SSTI
OPAT
Sepsis
BSI

Action

Streamlining examples	
Sample Intervention	**Outcomes / Benefits**
Discontinuation of metronidazole when the patient is receiving piperacillin/tazobactam for intra-abdominal infection	• Avoids duplicative therapy • Minimizes adverse drug reactions
Discontinuation of vancomycin in a nursing home patient who is colonized with MRSA but displays no sign of active infection	• Avoids unnecessary treatment of colonization in a patient without active signs of infection
Converting from ertapenem to cefazolin in a patient with a UTI caused by an *E. coli* that is susceptible to 1st generation cephalosporins	• Prevents the development of antimicrobial resistance • Reduces selective pressure on *E. coli* (and other Enterobacteriaceae) for carbapenem resistance

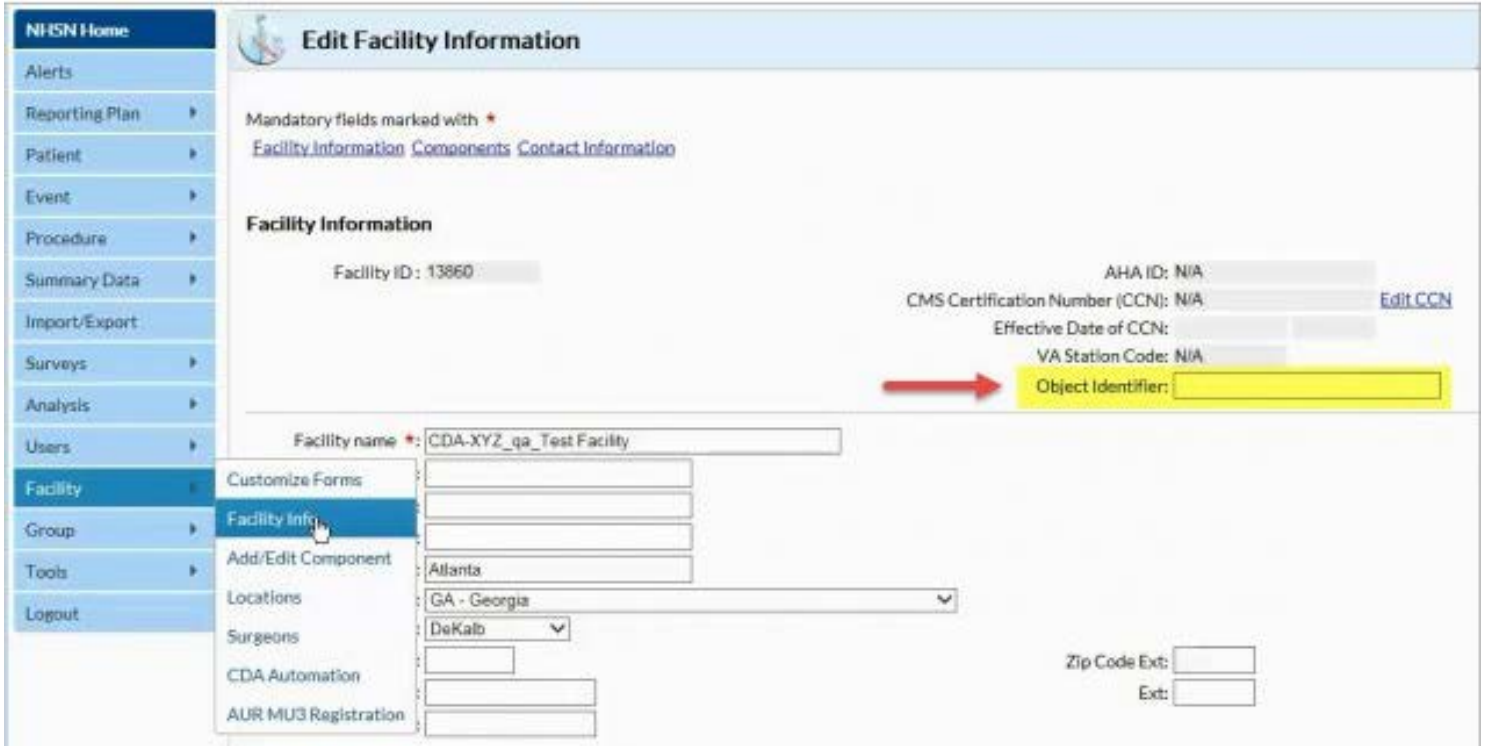
Examples of pharmacy-based antibiotic streamlining interventions [12]

Tracking

Monitor antibiotic prescribing, impact of interventions, antibiotic resistance, and other outcomes. [4]

- Antibiotic Use Measures
  - Hospitals can electronically submit antibiotic use data to the National Healthcare Safety Network (NHSN) Antimicrobial Use (AU) Option for monitoring and benchmarking
    - Measures rates of antibiotic use as days of therapy (DOTs) per days present
    - Also measures the Standardized Antimicrobial Administration Ration (SAAR), a risk-adjusted benchmark of observed antibiotic use compared to predicted antibiotic use
- Outcome Measures
  - C.diff infections
  - Antibiotic resistance patterns
  - 30-day readmission rates for C.diff and PNA
  - Financial impact
- Process Measures
  - Preauthorization or prospective audit and feedback interventions to identify areas needing more education/training
  - Adherence to facility-specific treatment guidelines by prescriber
  - Antibiotic timeout performance with appropriate diagnosis, drug, duration, and de-escalation
  - Frequency of discharges on correct antibiotics for recommended treatment duration
  - Frequency of missed IV to PO conversion

Tracking



Homepage of the National Healthcare Safety Network (NHSN) Antimicrobial Use (AU) Option for antimicrobial monitoring and benchmarking

Reporting

Regularly report information on antibiotic use and resistance to prescribers, pharmacists, nurses, hospital leadership, and other key stakeholders, as well as recommendations. [4]

- What to report
  - Focus on one to two outcomes at a time
  - State or local health department may be useful source of information on infection control and local antibiotic resistance
  - Facility-specific tracking measures
    - Consider unit-specific or provider-specific reporting
  - Identify areas of improvement/opportunities for engagement of different departments
  - Use non-blaming language that emphasizes opportunities for learning
- Where to report
  - Regularly report to hospital leadership
  - Quarterly staff meetings with physicians including ASP data
  - Post ASP data on intranet home page
  - Post ASP data in visible locations in each unit to engage staff

Reporting

Phoenix Indian Medical Center
Phoenix, AZ

CUMULATIVE ANTIMICROBIAL SUSCEPTIBILITY TEST DATA SUMMARY
January 1, 2020 - December 31, 2020

	Total # of Isolates	Amoxicillin	Amox/Clav	Ampicillin	Amp/Sulbactam	Azithromycin	Aztreonam	Cefazolin	Cefepime	Cefuroxime	Ceftriaxone	Ciprofloxacin	Clindamycin^	Daptomycin	Doxycycline	Ertapenem	Gentamicin	Imipenem	Levofloxacin	Linezolid	Nitrofurantoin ++	Oxacillin	Penicilin G	Piperacillin/Tazobactam	Tetracycline	Trimethoprim/Sulfa	Vancomycin
Citrobacter freundii *	22		0	0	0		91	0	100	0	91	100				100	95	100	100		100			91	86	86	
Citrobacter koseri	56		98	0	95		100	96	100	89	100	100				98	100	98	100		33			100	98	100	
E. coli	2637		85	51	57		95	89	95	92	94	83				100	92	100	84		98			98	76	74	
Enterobacter cloacae	88		0	0	0		93	0	97	0	84	95				91	98	98	98		43			92	91	92	
Klebsiella (Enterobacter) aerogenes	87		0	0	0		94	0	100	0	93	99				96	100		100		32			93	98	100	
Klebsiella oxytoca	51		88	0	22		88	68	88	86	88	90				100	92	100	100		96			96	90	86	
Klebsiella pneumoniae	534		94	0	85		96	93	96	93	95	96				98	98	99	98		59			96	87	91	
Proteus mirabilis	182		96	78	89		100	70	99	94	95	87				99	88		88					100		86	
Pseudomonas aeruginosa	107		0	0	0		89	0	94	0	0	91					100	88	89					88			
Enterococcus faecalis	158			99										100	30		100		92	97	100		98		22		98
Enterococcus faecium *	17			35										100	82		0		9	94			35		18		53
Group B Strep	67	93							97		94		38						98	100			97		11		98
MSSA	368			0	100			100					81	100	99		99		88	99		100			96	96	100
MRSA	338							R					74	99	97		95		18	100		R			96	95	100
Staph epidermidis	111				60			61					62	98	88		100		91	96	100	60			86		99
Strep pneumo *	8	100							100		100		100						100	100			100		100	50	100

Example of a facility-specific antimicrobial susceptibility reporting

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Education

In conjunction with ASP data reporting, provide education to prescribers, pharmacists, and nurses about adverse reactions from antibiotics, antibiotic resistance and optimal prescribing. [4]

- Health Care Professionals
  - Offer ongoing training opportunities to pharmacy, physicians, and nurses
    - Provide targeted education to key provider groups
    - Refresh teachings at inservices and grand rounds
  - Focus education on quality and safety versus cost
  - Integrate real patient stories
  - Incorporate antibiotic stewardship into new medical staff orientation
  - Publicize the stewardship campaign and alert staff of activities around priority topics to raise awareness and engagement
    - Posters, text messages, social media posts, etc.
- Patients
  - Provide information on when antibiotics are and are not indicated
  - Provide information on risks of antibiotic overuse

Education

Example of educational poster for use in a healthcare facility

Resource-Limited Hospitals

Recommendations

Focus on 1-3 SMART activities to achieve 1 priority topic at a time

- Training on guidelines
  - Pre-service, in-service, or even informal trainings or workshops to educate healthcare workers on guidelines or guidance
- Antibiotic rounds on a regular basis
- Prescription alerts for duplicative or overlapping therapy
- Audit/feedback
  - Evaluate appropriateness of prescribing to generate regular feedback to clinicians and modify prescribing practices as applicable
- Prior authorization
- Antibiotic restrictions
- Automatic stop order
- Automatic changes
- Selective lab reporting
- Cascade lab reporting
- Antibiotic timeout
- Antibiotic reminder
- Facility-level antibiogram

Self Assessment Tool

CDC

Released an Assessment Tool as part of the Core Elements of Hospital Antimicrobial Stewardship Programs

- Not all examples are necessary or feasible for each hospital
- Recommended to perform at least annually
- Add comments or modify as needed for facility
- Use assessment tool to guide areas for improvement

CORE ELEMENTS OF HOSPITAL ANTIBIOTIC STEWARDSHIP PROGRAMS: ASSESSMENT TOOL		ESTABLISHED AT FACILITY	COMMENTS
Hospital Leadership Commitment	7. Does facility leadership support enrollment and reporting into the National Healthcare Safety Network (NHSN) Antimicrobial Use and Resistance (AUR) Module, including any necessary IT support?	❑ Yes ❑ No	
	8. Other example(s):	❑ Yes ❑ No	
Accountability	1. Does your facility have a leader or co-leaders responsible for program management and outcomes of stewardship activities?	❑ Yes ❑ No	
	a. If a non-physician is the leader of the program, does the facility have a designated physician who can serve as a point of contact and support for the non-physician leader?	❑ Yes ❑ No ❑ NA	
	2. Other example(s):	❑ Yes ❑ No	
Pharmacy Expertise	1. Does your facility have a pharmacist(s) responsible for leading implementation efforts to improve antibiotic use?	❑ Yes ❑ No	
	2. Does your pharmacist(s) leading implementation efforts have specific training and/or experience in antibiotic stewardship?	❑ Yes ❑ No	
	3. Other example(s):	❑ Yes ❑ No	

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