Building the Pharmacy Workforce for Antimicrobial Stewardship (AMS)

Nebraska Antimicrobial Stewardship Assessment and Promotion Program

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Nebraska Antimicrobial Stewardship Summit
June 2, 2023

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Disclosures

The presenters do not have any relevant disclosures related to this presentation.

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Objectives

1. Appraise the need for increased pharmacist training to participate in antibiotic stewardship activities.

2. Assess various strategies and resources to grow pharmacist involvement in antibiotic stewardship programs in Nebraska hospitals.

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State of the Union:
Antimicrobial Stewardship Pharmacists

Jenna Preusker, PharmD, BCPS

Nebraska Antimicrobial Stewardship Assessment and Promotion Program, Pharmacist Coordinator

Nebraska DHHS Healthcare Associated Infections and Antimicrobial Resistance Program, Pharmacist

Nebraska Antimicrobial Stewardship
Assessment and Promotion Program

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What is an AMS Pharmacist?

Clinical Patient Care	Administrative	Team building
Drug Information	Regulatory preparedness	Interdisciplinary coaching
Core Infectious Disease Knowledge	Performance improvement/Quality	Engaging stakeholders
Facilitating medication or lab test utilization	Leading meetings	Championing campaigns
	Data analysis	Education
	Informatics	

Antimicrobial Stewardship Pharmacist (idstewardship.com)

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Antibiotic Stewardship - Program Growth

- Antimicrobial stewardship programs (ASPs) became a requirement for accreditation by The Joint Commission and a Condition of Participation for Medicare and Medicaid in 2017, which has led to a rapid expansion in the number and scope of ASPs.

- In 2021, 95% of hospitals reported that they met all 7 of the Centers for Disease Control and Prevention (CDC) Core Elements of a hospital ASP, up from just 41% in 2014

- Growth in ASPs has outpaced the number of infectious diseases-trained pharmacists, often requiring those without formal training through an ID residency or fellowship to take on ASP roles in addition to other duties.

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Changes in Hospital Core Element Implementation - Nebraska
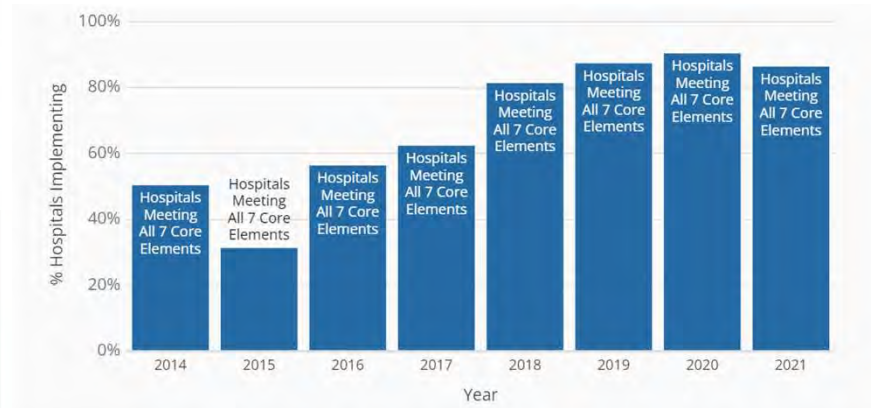
2021 – 71 of 83 reporting hospitals meeting all 7 Core Elements (86%)
This is 9% lower than the national implementation rate.

Nebraska | A.R. & Patient Safety Portal (cdc.gov)

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Pharmacist Assignment to Provide Clinical Services
ASHP National Survey of Pharmacy Practice in Hospital Settings, 2021

| RP Assigned at least 8 hours per day/5 days per week					
		ID/ASP RP	Critical Care RP	Med-Surg RP	Oncology RP
Staffed beds	n	% of hospitals			
<50	89	**23.3**	38.3	48.9	11.8
50 – 99	41	**25.0**	50.0	52.5	46.4
100 – 199	48	**44.7**	79.5	73.9	64.3
200 – 299	43	**69.8**	85.7	76.2	63.9
300 – 399	26	**88.5**	96.2	88.5	83.3
400 – 599	50	**90.2**	96.1	86.3	82.4
≥ 600	28	**96.4**	96.4	96.4	100

Schneider P, Pedersen C, Ganio M, et al. ASHP National Survey of Pharmacy Practice
in Hospital Settings: Clinical services and workforce—2021. AJHP 2022.

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Pharmacist Assignment to Provide Clinical Services
ASHP National Survey of Pharmacy Practice in Hospital Settings, 2021

RP Assigned ≥ 8 hours per day/5 days per week
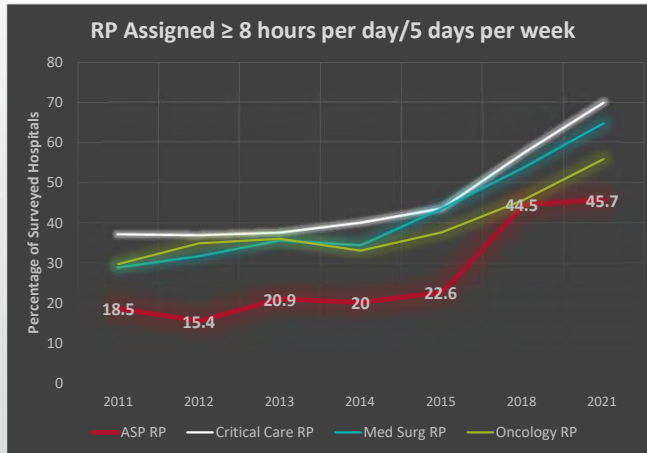
RP Assignment	2011-2021 % increase
Med Surg	35.9
Critical Care	32.8
ID/ASP	27.2
Oncology	26.2

Schneider P, Pedersen C, Ganio M, et al. ASHP National Survey of Pharmacy Practice in Hospital Settings: Clinical services and workforce—2021. AJHP 2022.

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Outpatient Clinic Operations
ASHP National Survey of Pharmacy Practice in Hospital Settings, 2021

		Infectious Diseases	Ambulatory	Anticoagulation	Pain/Palliative Care
Staffed beds	n	% of clinics			
<50	91	1.1	27.5	15.4	0
50 – 99	40	2.5	20	7.5	7.5
100 – 199	47	12.8	42.6	23.4	8.5
200 – 299	43	18.6	58.1	32.6	14
300 – 399	26	30.8	69.2	42.3	19.2
400 – 599	50	40	78	52	14
≥ 600	28	50	89.3	53.6	25

Schneider P, Pedersen C, Ganio M, et al. ASHP National Survey of Pharmacy Practice in Hospital Settings: Clinical services and workforce—2021. AJHP 2022.

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Outpatient Clinic Operations
ASHP National Survey of Pharmacy Practice in Hospital Settings, 2021
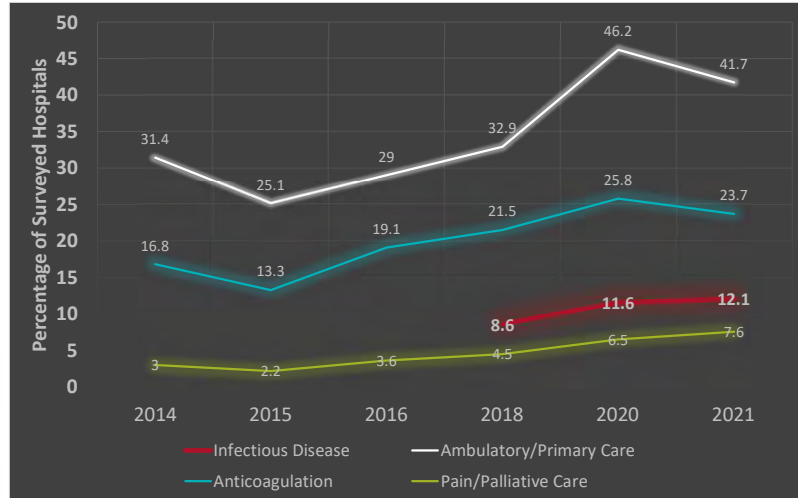
Schneider P, Pedersen C, Ganio M, et al. ASHP National Survey of Pharmacy Practice
in Hospital Settings: Clinical services and workforce—2021. AJHP 2022.

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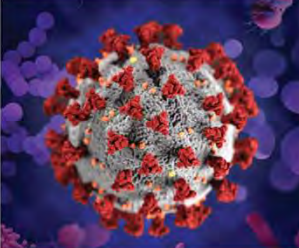# Antimicrobial Stewardship During the Pandemic

Artistic credit: KC Greene http://gunshowcomic.com/648

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Recommitting to AMS Pharmacists Post-Pandemic

Slide credit: Monica Mahoney, PharmD. SHEA Spring Meeting 2023 Seattle, WA

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Strategy 1:
Increase Learning Opportunities for AMS with Students and Residents

Scott Bergman, PharmD, BCIDP, FCCP, FIDSA
Pharmacy Coordinator, Antimicrobial Stewardship
Program Director,
PGY2 Infectious Diseases Pharmacy Residency
Nebraska Medicine
Clinical Professor, UNMC College of Pharmacy

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Student Participation

- Students completing an APPE in infectious diseases felt more confident in their knowledge
  - Basic microbiology fundamentals
  - Antimicrobial stewardship principles
  - Selecting appropriate therapy
  - Interpreting results of cultures and susceptibilities
  - De-escalation of therapy

Johnson MA. Curr Pharm Teach Learn. 2019

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Student Engagement in AMS

- IV to PO conversion
- Renal dose adjustments
- Patient and provider education
- Compare guidelines to existing order sets or assist in developing new clinical pathways
- Assess patients on combination therapy

Chahine EB. J Pharm Practice. 2015

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PGY1 Pharmacy Residency ASHP Match Rates

https://natmatch.com/ashprmp/stats.html Accessed 5/18/23

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ASHP PGY2-Infectious Diseases Pharmacy Residency Results

Personal communication, ASHP Accreditation Services: 3/28/23 & 5/24/23
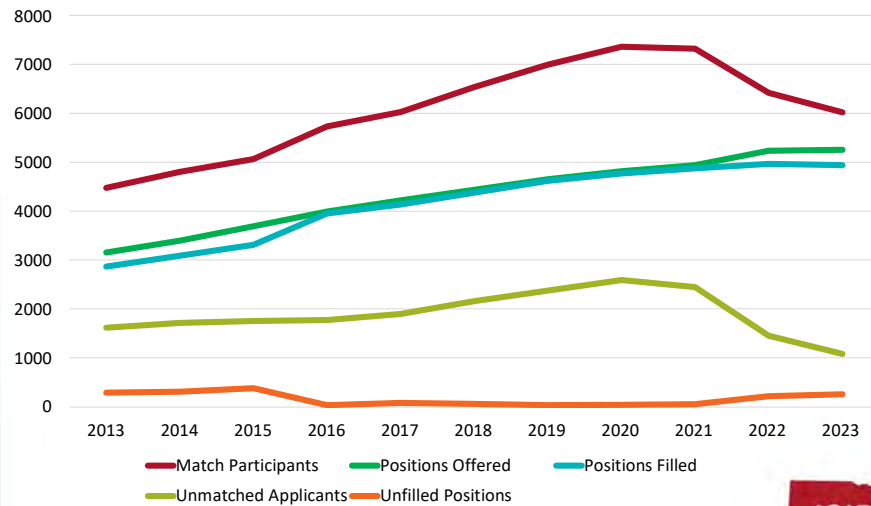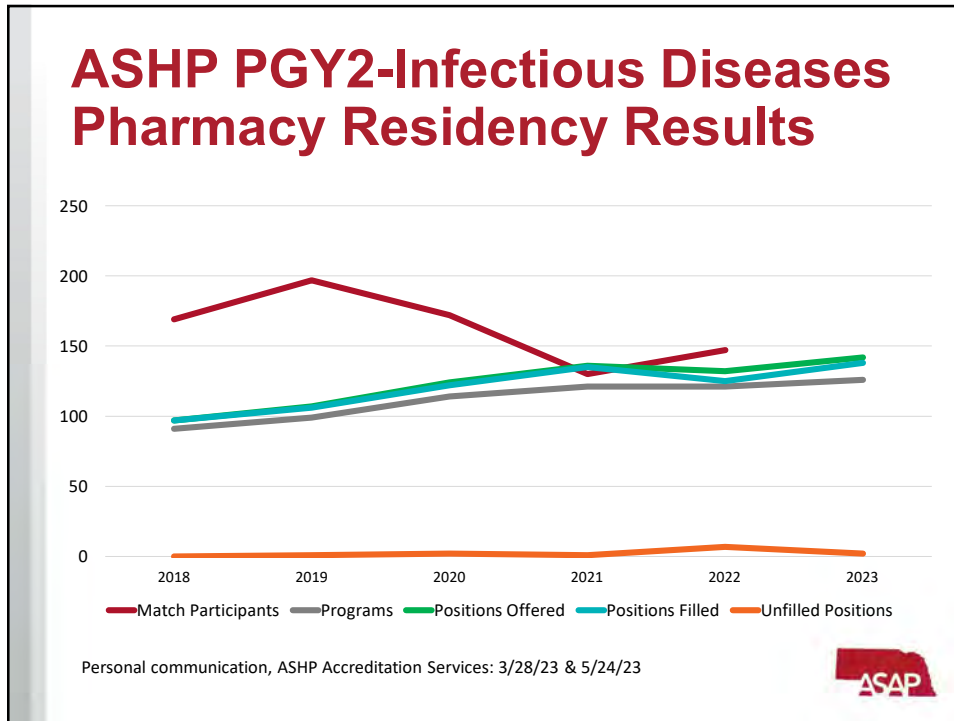
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Strategy 2:
Involve Pharmacists without Traditional Formal ID Training in AMS

Daniel Schroeder, PharmD, BCPS
Clinical Pharmacist Practitioner
Nebraska Medicine Bellevue

Nebraska Antimicrobial Stewardship
Assessment and Promotion Program

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How Did I Get Here?

The Joint Commission

New ASP standards in 2017

100 bed community teaching hospital

Needed on-site stewardship personnel

My Experience

Inpatient staff pharmacist since 2012

No formal ID training

Most experienced staff pharmacist at my location in suburban Omaha

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How Did I Get Here?

Hands on training at Nebraska Medicine
- Continued access to expertise when needed

Assistance from ID physicians
- Biweekly review of complicated patients

Dedicated time for stewardship
- Built into job description

Cheesy answer?
- Hard work and passion for patient care and stewardship!

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What do I do?

1 hour per day for ASP activities

- *Staphylococcus aureus* bacteremia
- Rapid blood pathogen panel result
- Pneumonia Panel result
- Drug-Bug Mismatch
- Targeted antimicrobial therapy
- Protected antimicrobial therapy

30 minutes twice per week to discuss patients with an ID physician

Prospective audit and feedback with"handshake" stewardship

- Build positive relationships with providers

Pharmacist education specific to Nebraska Medicine Bellevue

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How Can You Get Here?

Complete an antimicrobial stewardship certificate program

Collaborate with local experts

The Society of Infectious Diseases Pharmacists (SIDP)

Making a Difference in Infectious Diseases (MAD-ID)

The Society for Healthcare and Epidemiology of America (SHEA)

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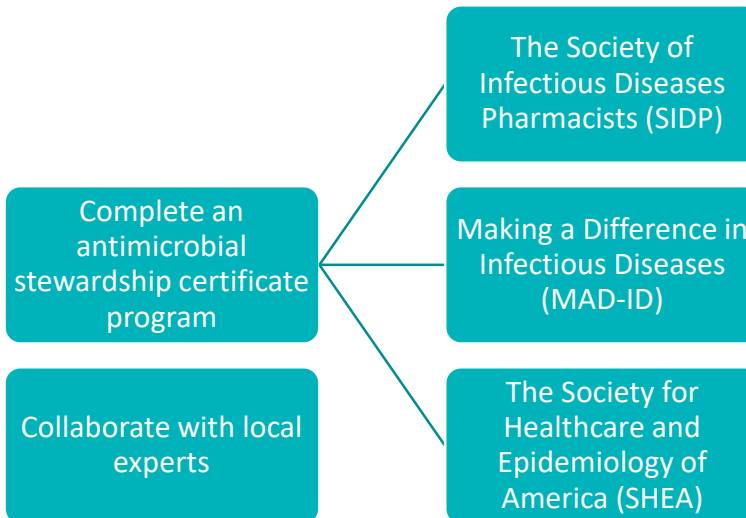
SIDP Certificate Program

- Consists of three parts
  - Foundational knowledge relevant for antimicrobial stewardship
  - Strategies for implementation of stewardship in various practice settings
  - Practice-based project: Demonstrate mastery of concepts via completion in 1 year
- On-demand self-study webinars
- New and improved certificate program set to be released soon!
- Cost: $600, previously was $750
  - Includes free membership for 1 year

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MAD-ID Basic Training Program

- Four-part program
  - Part 1 and 2 cover basic knowledge and skill central to antimicrobial stewardship
  - Part 3 contains three included elective lessons
    - 4 additional elective lessons can be completed for CE at an additional fee
  - Part 4 is a practical component similar to SIDP
- Optional quarterly teleconferences with select faculty and other learners in the program
- Cost: $500

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SHEA Antibiotic Stewardship Training Course

- Course built into the SHEA Spring Conference
  - Pre-work prior to the conference consisting of 5 online modules
  - 15 live sessions during the conference

- Cost: $899 - $1299
  - Varies depending on member status and time of registration
  - Physicians and pharmacists are eligible

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How Can You Get Here?

- Publicly available stewardship resources
  - CDC antimicrobial stewardship modules: https://www.cdc.gov/antibiotic-use/training/continuing-education.html
  - UNMC: https://www.unmc.edu/asp
  - Stanford: https://med.stanford.edu/bugsanddrugs.html
  - Michigan: https://www.med.umich.edu/asp/index.html
  - #TwitterID

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How Can You Get Here?

- Antibiotics Simplified by Gallagher and MacDougall
  - Drugs/Bugs, mechanisms of action
  - Common/notable antibiotic ADEs
  - Brief review of resistance mechanisms
  - Cost: ~$30
- Johns Hopkins Antibiotic Guide
  - Guidance for a large variety of infections, pathogens, and treatment options
  - Regularly updated
  - Cost: $30 for one year for one person or group rates
- Sanford Guide
  - Similar to Johns Hopkins guide
  - Spectrum of activity chart
  - Cost: $35-$80

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SHEA

Original Article

Which pharmacists are performing antimicrobial stewardship: A national survey and a call for collaborative efforts

Brandon Dionne PharmD[1] ⊙, Jamie L. Wagner PharmD[2] ⊙, Daniel B. Chastain PharmD[3] ⊙, Meagen Rosenthal PhD[4] ⊙, Monica V. Mahoney PharmD[5] ⊙ and Christopher M. Bland PharmD[6] ⊙

[1]Department of Pharmacy and Health Systems Sciences, School of Pharmacy and Pharmaceutical Sciences, Northeastern University, Boston, Massachusetts, [2]Department of Pharmacy Practice, School of Pharmacy, University of Mississippi, Jackson, Mississippi, [3]Department of Clinical and Administrative Pharmacy, College of Pharmacy, University of Georgia, Albany, Georgia, [4]Department of Pharmacy Administration, School of Pharmacy, University of Mississippi, University, Mississippi, [5]Beth Israel Deaconess Medical Center, Boston, Massachusetts and [6]Department of Clinical and Administrative Pharmacy, College of Pharmacy, University of Georgia, Savannah, Georgia

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Table 4. Percentage of Time Dedicated to the ASP in Pharmacists with Formal ASP Responsibilities

ASP Activity	Total (n = 118), Median (IQR)	Formal ID Training/ Certification (n = 76), Median (IQR)	No Formal ID Training/ Certification (n = 42), Median (IQR)	P Value
Pharmacist FTEs dedicated to ASP	1 (0.763–2)	1 (1–2)	1 (0.5–2)	.171
Direct ASP activities				
Review of restricted antimicrobials	4.5 (0–10)	5 (1–10)	0.5 (0–5)	.002
Antimicrobial de-escalation	15 (7–30)	20 (10–30)	10 (5–20)	<.001
Antimicrobial escalation/drug-pathogen mismatches	7.25 (5–10)	10 (5–15)	5 (2–10)	.022
Guideline and clinical pathway development and maintenance	5 (1–10)	5 (2–10)	5 (0–6.25)	.044
Parenteral to oral conversion	2.5 (0–5)	2 (0–5)	4.5 (1–10)	.023
Provider education	5 (1–5)	5 (1–8.75)	3.5 (1–5)	.396
Other ASP activities not listed	0 (0–10)	5 (0–10)	0 (0–5)	.001
Total direct ASP activities	60 (32.88–80)	70 (45–81.88)	35 (20–65)	<.001
Indirect or non-ASP activities				
Administration (e.g., committee work)	10 (5–15)	10 (5–20)	5 (1.75–10)	.001
Research	0 (0–5)	3.25 (1–8.75)	0 (0–5)	.023
Non-ASP activities (details not requested)	15 (0.75–51.25)	10 (0–24.5)	52.5 (15–71.25)	<.001
Total indirect or non-ASP activities	40 (20–67.13)	30 (12.13–55)	65 (35–80)	<.001

Note. ASP, antimicrobial stewardship; ID, infectious diseases; FTE, full-time equivalent

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Note. ASP, antimicrobial stewardship; ID, infectious diseases; FTE, full-time equivalent

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Table 3. ASP Activities Performed by Respondent According to National Quality Partners Playbook Classification of ASP Responsibilities

Variable	Total (n = 186), No. (%)	FR ASP Pharmacists (n = 109), No. (%)	NFR ASP Pharmacists (n = 78), No. (%)	P Value
Basic: systemwide interventions				
Antibiotic duration of therapy recommendations[a]	178 (95.7)	104 (95.4)	75 (96.2)	1.000
Antibiotic protocol, policy, or guideline development[a]	139 (74.7)	94 (86.2)	45 (57.7)	<.001
Antibiotic spectrum recommendations	182 (97.8)	108 (99.1)	75 (96.2)	.310
Intravenous-to-oral conversions	176 (94.1)	101 (92.7)	75 (96.2)	.365
Pharmacokinetic dosing and adjustments	175 (93.6)	102 (93.6)	73 (93.6)	.997
Intermediate: patient-specific interventions				
Antibiotic duration of therapy recommendations[a]	178 (95.7)	104 (95.4)	75 (96.2)	1.000
Antibiotic protocol, policy, or guideline development[a]	139 (74.7)	94 (86.2)	45 (57.7)	<.001
Antibiotic-related healthcare education[a]	135 (72.2)	88 (80.7)	47 (60.3)	.002
Advanced: diagnosis- and infection-specific interventions				
Recommendations to obtain antibiotic cultures or laboratory tests	132 (71)	77 (70.6)	55 (70.5)	.985
Receive notification of rapid diagnostic results	91 (48.7)	61 (56)	30 (38.5)	.018
Antibiotic-related healthcare education[a]	135 (72.2)	88 (80.7)	47 (60.3)	.002

Note. FR ASP, formal responsibilities for antimicrobial stewardship; NFR ASP, nonformal responsibilities for antimicrobial stewardship.
[a]Classified in >1 category due to complexity of activity.

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Strategy 3:
AMS Pharmacist Partnership Opportunities for Smaller & Critical-Access Hospitals

Anthony Rodewald, PharmD, BCPS
Director of Pharmacy
Community Hospital
McCook, NE

Nebraska Antimicrobial Stewardship
Assessment and Promotion Program

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How did we go about trying to meet stewardship requirements?

- Started collecting MDRO surveillance data in 2010; antimicrobial utilization in 2011; and developed a local antibiogram in 2012
    - <u>Obstacle</u>: After 2017, we were unable to produce a local antibiogram or collect antimicrobial utilization data until this became possible again for us in early 2022
- Developed a tracking form to be able to document progress in meeting the CDC Core Elements for Antimicrobial Stewardship in 2017
- Started with "low-hanging fruit"
    - Restricted antimicrobial list
    - Renal dose adjustment policy
    - Job descriptions
- Received outside input: Gap-analysis from Nebraska ASAP in 2020
- Started receiving remote stewardship support from UNMC in 2021
    - Daily calls (M-F) to review current antimicrobial therapy

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CDC Core Elements of Antimicrobial Stewardship for CAH - HHA Survey Template		
CORE ELEMENTS 1 AND 2: Leadership Commitment/Accountability	**Status**	**Comments**
Leadership commitment from hospital executive and board.		
Highly sustainable program includes leadership commitment from: CMO, Pharmacy Director, Nursing Leaders and Infection Control		
Designate physician (CMO) or individual who reports to c-suite to be accountable for outcomes of antibiotic stewardship program *** *The hospital has designated a leader (e.g., physician, pharmacist, etc.) responsible for program outcomes of antibiotic stewardship activities at the hospital.* *** CMS requirement	Yes	Anthony Rodewald, PharmD (recognized as owner for Antimicrobial Stewardship activities on the Quality Seed Action Plan - 11/21/17. Dr. Eskildsen has agreed to be physician leader responsible for program outcomes and serve on the antimicrobial stewardship committee (June 2018).
Develop a policy for antibiotic stewardship program to include all CDC core elements *** *The hospital has written policies and procedures whose purpose is to improve antibiotic use (antibiotic stewardship)* *** CMS requirement	Yes	Pharmacy has individual policies addressing aminoglycoside & vanco dosing, C & S monitoring, IV to PO conversion, antimicrobial restriction & utilization guidelines, and EIPTZ dosing. Overarching/"umbrella" policy was approved through ASP on 5/16/19.
Integrate stewardship activities into ongoing hospital quality/performance improvement and/or patient safety program	Yes	Reporting 2x/year antimicrobial stewardship metrics/activities to QMC. IV to PO conversion and appropriate Abx use being monitored on pharmacy dept. dashboard and reported each month in ASP.
Create a reporting structure for the stewardship program to ensure stewardship activities information and outcomes are shared with hospital leadership and board	Yes	Formally approved as an Action Plan on the Quality Seed on 10/21/17. Progress on meeting the Core Elements and activities reported through Quality Seed and metrics reported through P&T and QMC.

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Patient and family education provided	Yes	Education given to all inpatients on pamphlet discussing MDRO's, CAUTI's, CDI, antibiotic stewardship principles
Integrate regular updates on antibiotic stewardship and resistance into hospital communication tools (ex: focus on CAP, UTI, SSTI)	No	
Provide targeted education to key providers and staff annually	Yes	CDI management plan and treatment/new order set (2019).
One-on-one provider education/coaching	Yes	Concurrent review recommendations are taken to providers after discussing treatment with UNMC ASP.
Incorporate antibiotic stewardship education into orientation for new staff (providers, pharmacists and nursing)	No	
Require annual antibiotic stewardship education for staff	No	
Incorporate antibiotic stewardship into (re)credentialing education	No	
Ask for patient-family advisory committee for input on patient education material	Yes	We do have a council. Inpatient and outpatient educational material going to advisory committee for input on July 27, 2020.
Develop stories to share how patients' lives are affected by complications of antibiotic use (ex C-diff).	No	Candy working with Bruce at paper to publish article (editorial) about the State initiatives on antimicrobial resistance and stewardship.
Include information on antibiotics in patient education materials	Yes	New med teaching done in hospital as well as pamphlet given to all admits on antibiotics developed from CDC's BeAware program.
Other hospital initiatives:		
Resources:		
https://www.cdc.gov/getsmart/healthcare/implementation/core-elements-small-critical.html		
https://www.cdc.gov/nhsn/acute-care-hospital/aur/index.html		

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Benefits CH has received from remote stewardship

- Improved quality/patient care outcomes
- Increased pharmacist knowledge/confidence
- Students love it!
- Enhanced provider/pharmacy collaboration
- Participation in ASP team meetings
- Feedback on meeting ASP requirements
- Assistance with developing order sets
- Expertise to help decipher metrics and develop action plans

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Empowering Staff

- Job descriptions
- Annual goals – SIDP antimicrobial stewardship certificate program
  - Make sure these are linked to your performance evaluation system
- Lead the daily calls initially
  - Encourage group participation

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Antimicrobial Stewardship Program
Community Hospital, McCook, NE

Background
- Inappropriate antibiotic use is a driving factor in the growing crisis of antibiotic resistance. In the US more than 2.8 million antimicrobial-resistant infections occur each year and over 35,000 of these patients die.
- Antibiotic use also has unintended consequences, including *C. difficile* diarrhea and other adverse events. *C. difficile* infections alone affect more than 500,000 patients and are associated with more than 15,000 deaths in the US each year.
- Fortunately, programs focused on improving antibiotic use have proven to be effective in mitigating these threats.
- Community Hospital is committed to implementing and maintaining a robust antimicrobial stewardship program.

Plan
- Participated in Nebraska Medicine's "Antimicrobial Stewardship Assessment and Promotion Program" in April 2018.
- Formed antimicrobial stewardship committee in June 2018.
- Entered into contract with UNMC in April 2020 to provide infectious disease expertise and daily antibiotic review calls.
- Developed order sets to guide antibiotic use for pneumonia, skin and soft tissue infections, urinary tract infections, and *C. difficile* infections.
- Implemented Sentri7 surveillance software in March 2022 in order to facilitate data collection and reporting of antimicrobial stewardship metrics and to be able to develop a local antibiogram.

Results

Next Steps
- Continue to educate providers and the public
- Continue to track outcomes
- Report antibiotic consumption data to NHSN database for benchmarking

Team
Antimicrobial Stewardship Committee members: Dr. Eskildsen, Anthony Rodewald, Chase Crawford, Lori Ryland, Brad Hays, Janelle Carter, Ashley Vontz NP-C, Julie Wilhelmson, Kimberly Holliday, Lindsey Dame, Brandi Renner, UNMC ASP Team

Aims
Improve patient outcomes by 1) improving infection cure rates, 2) reducing adverse events, including *C. difficile* infection, and 3) reducing antibiotic resistance

Measure
- CH's ASP has numerous metrics they employ to track appropriate antibiotic use, but the primary outcomes they measure are 1) the prevalence of antibiotic-resistant organisms and 2) the incidence of *C. difficile* infections.

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Cultures Resulting After Discharge
Community Hospital, McCook, NE

Background
- Community Hospital is a 25 bed Critical Access Hospital
- Due to the time required for cultures to grow, there are a significant number of bacterial cultures that result after patient discharge.
- Historically, the responsibility for following up on these cultures that resulted after patient discharge had been assigned to the ED provider(s) working the day the culture resulted.
- Audits revealed this was not a well-controlled process with documented follow-up varying from 33% to 100% depending on the month, with the average < 75%

Plan
- Determined that, given the nature of the ED setting, it was unlikely that we would be able to achieve consistent follow-up with these results unless the process was entirely re-designed and responsibility was assigned elsewhere.
- It was decided that our CH pharmacists would take over the responsibility for assuring the ordering provider is notified of these results in a timely manner.
- Pharmacy worked with the IT team and with Sentri7 support to make sure all culture results are routed to the pharmacy team for review.
- The pharmacist reviews the culture reports that drop into the Sentri7 surveillance software and then notifies the ordering provider of the results along with appropriate antibiotic recommendations if warranted.
- The pharmacist then uses the Sentri7 surveillance software for documenting this follow-up.
- New process went live in May of 2022 (Q4 FY22).

Results

	Q3 FY22	Q4 FY22	Q1 FY23	Q2 FY23
Numerator	41	62	113	89
Denominator	70	67	113	89
% Compliance	59%	93%	100%	100%

Culture & Sensitivity Follow-up

Next Steps
- Continue to monitor compliance with documented follow-ups for all culture and sensitivity reports that final and report this out on the pharmacy QA dashboard.
- Provide feedback accordingly if goal of 100% isn't met.

Team
Anthony Rodewald, Chase Crawford, Lori Ryland, Janelle Carter

Aims
Reduce delays and ensure appropriate treatment related to cultures resulting after discharge from hospital.

Measure
- Numerator - # of culture and sensitivity reports that had documented follow-up completed.
- Denominator - # of final positive culture and sensitivity reports.

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Community Hospital's Antimicrobial Stewardship Program Leading the State

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Additional Strategies to Expand the AMS Pharmacist Workforce

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Additional strategies to expand the AMS pharmacist workforce

Advocacy and policy support:
- Advocate for the inclusion of antibiotic stewardship in professional organizations' guidelines and practice standards.
- Work with regulatory bodies and policymakers to promote the importance of antibiotic stewardship and the need for specialized pharmacists in this field.

Networking and collaboration:
- Facilitate networking opportunities and collaboration among antibiotic stewardship pharmacists.
- This can be done through conferences, webinars, online forums, and professional associations dedicated to antibiotic stewardship.
- Attend Nebraska DHHS Healthcare Associated Infections and Antimicrobial Resistance Program quarterly meetings

Research and evidence-based practice:
- Encourage pharmacists to engage in research and publish studies related to antibiotic stewardship.
- Promote integration of evidence-based practices in ASPs.

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Additional strategies to expand the AMS pharmacist workforce

Workforce integration:
- Collaborate with healthcare institutions to integrate antibiotic stewardship pharmacists into healthcare teams.
- Ensure that their roles and responsibilities are well-defined and aligned with the goals of antibiotic stewardship programs.

Public awareness campaigns:
- Educate the public about the importance of responsible antibiotic use and the role of antibiotic stewardship pharmacists.
- Support CDC's annual Antibiotic Awareness Week Campaign

USAAW is an annual observance that raises awareness of the threat of antibiotic resistance and the importance of appropriate antibiotic use.

BE ANTIBIOTICS AWARE
SMART USE, BEST CARE

U.S. Antibiotic Awareness Week (USAAW) | Antibiotic Use | CDC

Partner Toolkit
You can participate in USAAW activities and events, or host your own. There are many ways to get involved.

Get Involved
Join CDC and partners as we highlight ways to combat antibiotic resistance and improve patient safety.

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Thank you!

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