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Concise Communication

In-depth assessment of critical access hospital stewardship program adherence to the CDC Core Elements in Iowa and Nebraska

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Abstract

In 21 antimicrobial stewardship programs in critical-access hospitals in Nebraska and Iowa that self-reported nonadherence to a CDC Core Element or Elements, in-depth program assessment and feedback revealed that accountability and education most needed improvement. Recommendations included providing physician and pharmacist training, tracking interventions, and providing education. Program barriers included lack of time and/or personnel and antimicrobial stewardship and/or infectious diseases expertise.

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Critical-access hospitals (CAHs), defined as rural, ≤25-bed hospitals with 24-hour emergency care and average lengths of stay ≤96 hours, are required by the Centers for Medicare and Medicaid Services (CMS) to implement effective antimicrobial stewardship programs (ASPs). These programs are measured by the Centers for Disease Control and Prevention (CDC) 7 Core Elements of antimicrobial stewardship.[1–3] Unfortunately, CAHs appear to lag behind larger, urban hospitals in establishing successful, sustainable ASPs. Only 79.5% of CAHs met all 7 core elements in 2019 compared to 92% of acute-care hospitals.[4] There are 63 CAHs in Nebraska, and 82 in Iowa, comprising 59% and 65.6% of hospitals but only 17% and 20% of hospital beds, respectively.[5,6] To improve this disparity in core elements implementation, we evaluated CAH ASPs using standardized self-assessments and interviews to assess adherence to the CDC Core Elements and barriers to implementation. Subsequently, we provided structured feedback with resources to address deficiencies.

Methods

Assessments and interviews were performed by infectious diseases (ID) physician- and pharmacist-led telehealth stewardship support programs. In Nebraska, ASP assessment has been available by request through the Nebraska Antimicrobial Stewardship Assessment and Promotion Program (ASAP) since 2018, and 5 CAHs requested assessment in 2022. Nebraska ASAP is funded by the Nebraska Department of Health and Human Services health-care-associated infection and antimicrobial resistance (HAI/AR) program through a grant from the CDC. In Iowa, Nebraska Medicine's Remote Antimicrobial Stewardship Support Service was funded by the Iowa Department of Public Health's (DPH) Rural Hospital Medicare Flexibility Program to assess CAHs. Among 82 CAHs in Iowa, the Iowa DPH offered assessments to 21 CAHs that self-identified as not meeting all 7 core elements, and 16 accepted. A self-assessment was distributed to all facilities, followed by a virtual interview with ASP experts to assess adherence to the core elements (Supplementary Fig. 1 online). A standardized feedback report was generated for each ASP documenting adherence to the core elements and recommending strategies and implementation resources to address deficiencies.

We summarized the results of these evaluations, including adherence to the individual core elements, high-priority recommendations to meet core elements, resources provided, and self-identified barriers. Core element adherence was assessed as full (1 point), partial (0.5 points), or deficient (0 points). Deficient core elements were defined as no implementation of the core element components. Partial core elements were defined as some inclusion of aspects of the core element but were judged incomplete or not functional. Resources and barriers were categorized using thematic analysis. The 3 greatest ASP barriers were extracted from the initial self-assessment form.

Results

In surveys and interviews completed with 21 programs (5 in Nebraska and 16 in Iowa) from March to November 2022, a median of 5 full core elements were met (range, 2.5–6.5) (Table 1). Full or partial adherence was reported for all 7 core elements in

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Table 1. Adherence to the Individual CDC Antibiotic Stewardship Core Elements Among 21 Critical Access Hospitals in Iowa and Nebraska

Core Element	Full Core Element Met, No. (%)	Partial Core Element Met, No. (%)	Core Element Deficient, No. (%)
Leadership commitment	16 (76.2)	5 (23.8)	0 (0)
Accountability	4 (19)	10 (47.6)	7 (33.3)
Drug Expertise	10 (47.6)	10 (57.6)	1 (4.8)
Action	21 (100)	0 (0)	0 (0)
Tracking	15 (71.4)	5 (23.8)	1 (4.8)
Reporting	15 (71.4)	5 (23.8)	1 (4.8)
Education	9 (42.9)	0 (0)	12 (57.1)

only 6 (28.6%) of 21 ASPs, and 5 (23.8%) of 21 had at least 2 deficient core elements. Core elements with the highest full adherence were action (100%) and leadership commitment (76.2%), and the lowest were accountability (19%) and education (42.9%).

The most frequent high-priority recommendations (Table 2) were providing physician and pharmacist ASP leader training (19 of 21, 90.5%), tracking antimicrobial stewardship interventions (12 of 21, 57.1%), and providing and tracking educational activities (12 of 21, 57.1%). Notably, one-third of programs were recommended to establish or reconvene ASP meetings and to establish a physician leader. A median of 10 resources were provided to each ASP as part of their evaluation, primarily consisting of reporting and tracking templates, regulatory requirements, and policies and guidance document examples (Table 2).

Of 20 programs reporting their 3 greatest barriers, 16 (80%) self-identified barriers to implementing or improving their program, with a median of 2.5 barriers per program (Table 2). The most common barriers were a lack of dedicated resources (eg, time and/or personnel), lack of access to ID physicians or a lack of ID knowledge, and limitations in electronic medical record (EMR) capabilities (eg, integrating guidance into order sets, reporting to the National Healthcare Safety Network [NHSN], of tracking antibiotic use).

Discussion

In our in-depth evaluation of 21 CAH ASPs that did not meet all 7 CDC Core Elements, the greatest deficiencies were in accountability and education. In contrast to our findings, the CDC 2021 NHSN survey found that 95% of ASPs self-reported adherence to all core elements, including 71 (85.5%) of 83 of Nebraska ASPs and 107 (96.4%) of 111 of Iowa ASPs.[7] In these surveys, 100% of Iowa ASPs and 98% of Nebraska ASPs reported that they met the accountability core element, compared to 19% in this evaluation.[7] Although our evaluation was not a systematic survey, 16 Iowa CAH ASPs and 5 Nebraska CAH ASPs did not meet all 7 core elements, including nearly 25% that were deficient in multiple core elements. Several factors may explain these differences. Our population was enriched with deficient facilities due to our sampling method, but not all facilities are represented in the NHSN data, either. Concern about penalties when responding to official surveys may prompt overly generous self-assessments. Our evaluation methods may have been stricter than the CDC methodology, but even when given credit for partial adherence, 71% of these ASPs did not meet all 7 core elements. Several programs had no regular ASP meetings, physician leader, educational activities, or specific antimicrobial stewardship–related training for their physician or pharmacist leaders. Thus, NHSN surveys may overestimate adherence to the core elements and underrepresent CAHs, especially those with less well-developed ASPs. The 2021 NHSN annual survey response rates were only 54 (86%) of 63 Nebraska CAHs and 69 (84%) of 82 of Iowa CAHs.[7] We identified significant leadership deficits, with most physicians and pharmacists lacking training in ID or antimicrobial stewardship, which The Joint Commission and the CMS now require.[3,8] This finding is not unexpected in these rural locations where experts are unavailable. At the same time, CAH ASPs are looking for opportunities to improve and are actively seeking expert guidance. The COVID-19 pandemic likely contributed to disruption in some of these ASPs. The limitations of this study include small sample size, qualitative assessment methodologies, and selection bias. Thus, these results should be extrapolated cautiously.

Our findings suggest a need for greater emphasis on developing ASPs in CAH settings, given unique barriers to establishing and maintaining successful ASPs. A 2017 Kansas survey identified several barriers more prevalent in CAHs than acute-care hospitals: fewer full-time pharmacists, less leadership support, a lack of clinical decision support, no antibiograms, and no defined formulary.[9] In 6 Vermont CAH ASPs, similar barriers were recognized: lack of protected time for ASP leaders, EMR data-acquisition difficulties, financial limitations with high physician and pharmacist turnover (including temporary clinicians), and slow turnaround time from outside microbiology laboratories.[10] Despite these barriers, CAHs have several advantages over larger, urban hospitals: less institutional bureaucracy to navigate and smaller, more familiar clinical staff.[10]

Identified barriers included a lack of physician leadership, a lack of ID and antimicrobial stewardship training and expertise, and a lack of financial and/or personnel resources. Most physician leaders had family or internal medicine training with residency programs that traditionally lack stewardship training. A lack of customizable EMRs and clinical decision-support tools, which preclude NHSN reporting or make data tracking and reporting difficult, were an additional barrier, even in CAHs belonging to larger hospital networks. Potential strategies to improve CAH ASPs include the use of telestewardship to increase the access of ID physicians to rural areas and the creation of collaborative CAH ASP networks to educate, train, and coach non-ID physicians and pharmacists in leading ASPs. CAH ASPs warrant further study to improve antibiotic use in rural communities.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/ice.2023.179

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Table 2. Barriers to ASP Initiation, High Priority Recommendations Arranged by CDC Core Elements, and Resources Provided[a]

Barriers to ASP Initiation and/or Improvement	N = 20* (%)	Program Recommendations	N = 21 (%)	Resources Provided	Total (N = 21), No. (%)
Lack of dedicated resources, (eg, time and personnel)	15 (75)	Leadership support		Intervention tracking template	19 (90.5)
Lack of infectious disease physician or knowledge	8 (40)	Establish ASP committee meetings	7 (33.3)	Annual dashboard report template	18 (85.7)
EMR limitations	5 (25)	Improve ASP committee representation and define committee roles	2 (9.5)	CMS Criteria 2022 update and The Joint Commision requirements 2023	16 (76.2)
Too few patients to make impact	4 (20)	Update ASP policy	1 (4.8)	Antibiotic time-out template	14 (66.7)
Need for clinician support and/or prioritization	5 (25)	Add ASP duties to job description	1 (4.8)	Antibiotic use summary template	14 (66.7)
Skilled beds antibiotic use	2 (10)	Accountability/Drug expertise		Daily antibiotic checklist template	13 (61.9)
		Provide physician and pharmacist leader ASP training	19 (90.5)	Urinalysis, urine culture, and urinary tract infection guidance	11 (52.4)
		Establish physician leader	7 (33.3)	NHSN Reporting	11 (52.4)
		Establish pharmacist leader	1 (4.8)	IV-to-PO conversion policy	10 (47.6)
		Collaborate between contract pharmacy and hospital	1 (4.8)	Institutional ASP policy template	8 (38.1)
		Action/Tracking		Antibiotic use tracking template	7 (33.3)
		Track antimicrobial stewardship interventions	12 (57.1)	Leadership support statement	4 (19)
		Track antibiotic use	10 (47.6)	Durations of antibiotic therapy	4 (19)
		Implement antibiotic time-out and track usage	9 (42.9)	Measurement of antibiotic use in hospitals	4 (19)
		Implement order sets and track usage	8 (38.1)	Antibiotic stewardship metrics	4 (19)
		Implement treatment guideline and track adherence	3 (14.3)	ASP tracking and reporting	4 (19)
		Collaborate with parent hospital system for EMR support with interventions	3 (14.3)	Updates on antibiotics in sepsis and septic shock	3 (14.3)
		Implement intervention for treatment durations	2 (9.5)	Piperacillin-tazobactam extended infusion protocol	2 (9.5)
		Implement antibiotic indication and duration into ordering process	1 (4.8)	Rapid blood-culture identification panel guidance	2 (9.5)
		Establish system for missed culture follow-up	1 (4.8)	CDI guidance	2 (9.5)
		Reporting		12 other resources given 1 time each	
		Report antibiotic use data to the NHSN	6 (28.6)		
		Report antibiotic use to clinicians	4 (19)		
		Report via quality committee	4 (19)		
		Education			
		Provide and track educational activities	12 (57.1)		
		Provide education on rapid identification panels	3 (14.3)		

Note. ASP, antimicrobial stewardship program; CDI, *Clostridioides difficile* infection; CMS, Centers for Medicare and Medicaid Services; EMR, electronic medical record; IV, intravenous; NHSN, National Healthcare Safety Network; PO, oral.
[a]For barriers, 1 hospital had missing data, and up to 3 responses were allowed per hospital.

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