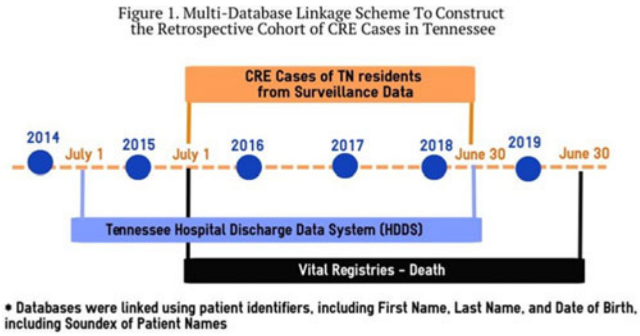

Fig. 1.

patients was conducted. Laboratory data were gathered from CRE isolates of Tennessee residents from July 1, 2015, to June 30, 2018. The most recent Council of State and Territorial Epidemiologists CRE and CP-CRE case definition was used to confirm and classify cases. Healthcare exposures within 1 year prior to onset, demographic characteristics, and clinical characteristics were obtained by linking surveillance data with the inpatient and outpatient Tennessee hospital discharge data. Cases were also matched with Tennessee vital statistics data to determine all-cause 30-day mortality from the event date. We evaluated risk ratios of 30-day mortality with a multivariable regression model. **Results:** Among 1,034 CRE cases that had at least 1 isolate submitted to public health, 445 (43.0%) were CP-CRE and 589 (57.0%) were non–CP-CRE. Among CP-CRE isolates, the *blaKPC* gene was found in 434 (98.9%). CP-CRE cases were more likely to have isolates from normally sterile sites, to have an organism with elevated resistance to meropenem (minimum inhibitory concentration, ≥16 μg/mL), to have prior admission to a long-term acute-care hospital, and to live in a nursing home (all $P < .001$). Also, 77 CP-CRE cases (17.3%) and 56 non–CP-CRE cases (9.6%) died within 30 days of infection onset. The risk of 30-day mortality was 57% higher for CP-CRE (adjusted risk ratio, 1.57; 95% CI:, 1.10–2.23) compared to non–CP-CRE patients after adjusting for comorbidities, nursing home residence, and prior healthcare exposures. **Conclusions:** CP-CRE cases had poorer outcomes than non–CP-CRE cases. This may be related in part to a higher proportion of sterile site infections among CP-CRE cases; our study was underpowered to analyze this subpopulation of sterile site cases. We plan to continue monitoring and performing analyses as mortality and hospital discharge data from more recent years become available and as more cases accumulate.

Table 1. Characteristics of Adult TN Cases of Carbapenem-Resistant Enterobacteriaceae, July 2015 – June 2018

Baseline Characteristics	CRE Category N (%)or Mean (SD)*		p-value**	Overall
	Non-CP-CRE n=589 (57.0)	CP-CRE n=445(43.0)		
Age, years	65.8 (17.3)	63.9 (15.7)	0.070	65.0 (16.7)
Females	368 (63.7)	224 (50.6)	<0.001	592 (58.0)
Race				
White	369 (62.6)	316 (71.0)	<0.001	685 (66.3)
Black	126 (21.4)	111 (24.9)		237 (22.9)
Other	94 (16.0)	18 (4.0)		112 (10.8)
Primary Isolate				
Urine	441 (74.9)	254 (57.1)	<0.001	695 (67.2)
Blood	23 (3.9)	41 (9.2)		64 (6.2)
Other Sterile Sites	3 (0.5)	7 (1.6)		10 (1.0)
Other Non-Sterile Sites	122 (20.7)	143 (32.1)		265 (25.6)
Genera				
Enterobacter	230 (39.1)	208 (46.7)	<0.001	438 (42.4)
Escherichia	211 (35.8)	34 (7.64)		245 (23.7)
Klebsiella	148 (25.1)	203 (45.6)		351 (33.9)
Medicare/Medicaid Insurance	390 (66.2)	359 (80.7)	<0.001	749 (72.4)
Charlson's Comorbidity Index	3.0 (2.2)	2.2 (2.4)	<0.001	2.6 (2.4)
Underlying Conditions				
Diabetes	135(22.9)	151 (33.9)	<0.001	286 (27.7)
Congestive Heart Failure	156 (26.5)	185 (41.4)	<0.001	340 (32.9)
Moderate-to-Severe Renal Diseases	182 (30.9)	192 (43.2)	<0.001	374 (36.2)
Any Cancer	62 (10.5)	59 (13.3)	0.176	121 (11.7)
Cerebrovascular Diseases	91 (15.5)	96 (21.6)	0.011	187 (18.1)
Healthcare exposures during prior year				
Inpatient hospitalizations	348 (59.1)	372 (83.6)	<0.001	720 (69.6)
Resident of a long-term care facility	146 (24.8)	220 (49.4)	<0.001	366 (35.4)
Admission to LTACH	16 (2.7)	43 (9.7)	<0.001	59 (5.7)
Inpatient or outpatient surgery	126 (21.4)	156 (35.1)	<0.001	282 (27.3)
Non-surgical Endoscopy	44 (7.5)	66 (14.8)	<0.001	110 (10.6)
Assisted Ventilation > 96 hrs	41 (7.0)	112 (25.2)	<0.001	153 (14.8)
Meropenem MIC, μg/mL				
<4	438 (74.4)	100 (22.5)	<0.001	538 (52.0)
4-15	127 (21.6)	142 (31.9)		269 (26.0)
>=16	24 (4.1)	203 (45.6)		227 (22.0)
Mortality in 30 days	56 (9.5)	77 (17.3)	<0.001	133 (12.9)

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Poster Presentation

Carbapenemase-Producing, Carbapenem-Resistant *Acinetobacter baumannii*: Summary of CDC Consultations, 2017–2019

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Background: Carbapenemase-producing carbapenem-resistant *Acinetobacter baumannii* (CP-CRAB) are a public health threat due to potential for widespread dissemination and limited treatment options. We describe CDC consultations for CP-CRAB to better understand transmission and identify prevention opportunities. **Methods:** We defined CP-CRAB as CRAB isolates with a molecular test detecting KPC, NDM, VIM, or IMP carbapenemases or a plasmid-mediated oxacillinase (OXA-23, OXA-24/40, OXA-48, OXA-58, OXA-235/237). We reviewed the CDC database of CP-CRAB consultations with health departments from January 1, 2017, through June 1, 2019. Consultations were grouped into 3 categories: multifacility clusters, single-facility clusters, and single cases. We reviewed the size, setting, environmental culturing results, and identified infection control gaps for each consultation. **Results:** We identified 29 consultations involving 294 patients across 19 states. Among 9 multifacility clusters, the median number of patients was 12 (range, 2–87) and the median number of facilities was 2 (range, 2–6). Among 9 single-facility clusters, the median number of patients was 5 (range, 2–50). The most common carbapenemase was OXA-23 (Table 1). Moreover, 16 consultations involved short-stay acute-care hospitals, and 6 clusters involved ICUs and/or burn units. Also, 8 consultations involved skilled nursing facilities. Environmental sampling was performed in 3 consultations; CP-CRAB was recovered from surfaces of portable, shared equipment (3 consultations), inside patient rooms (3 consultations) and nursing stations (2 consultations). Lapses in environmental cleaning and interfacility communication were common across consultations.

Table 1. Carbapenemases by Consultation Category

Oxacillinases	Multisite (n = 9)	Single Facility (n = 9)	Single Case (n = 11)	Total
OXA-23	5	7	4	16
OXA-24/40-like	3	2	1	6
OXA-235-like	1	0	0	1
NDM	0	0	4	4
KPC	0	0	2	2

Among 11 consultations for single CP-CRAB cases, contact screening was performed in 7 consultations and no additional CP-CRAB was identified. All 4 patients with NDM-producing CRAB reported recent international travel. **Conclusions:** Consultations for clusters of oxacillinase-producing CP-CRAB were most often requested in hospitals and skilled nursing facilities. Healthcare facilities and public health authorities should be vigilant for possible spread of CP-CRAB via shared equipment and the potential for CP-CRAB spread to connected healthcare facilities.

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Care Bundles for Preventing Device Related Infections: Just Focus on These 6 Things

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Background: Centralizing healthcare associated infection (HAI) data for 21 hospitals across several states facilitates a big picture assessment of monthly enterprise performance along with evaluation of practice, policy, and products. Variation in prevention practices has made it difficult to identify areas of focus and created confusion when attempting to standardize prevention tactics for central-line and urinary catheter care. Lack of consistent practice audits have made it difficult to evaluate actual practice. For these reasons, we performed a gap analysis to understand the current state. **Methods:** Gap assessment tools were developed to assess infection prevention practices for central lines and indwelling urinary catheters. Survey questions were developed with a comment option to collect qualitative data. The 2014 *Compendium of Strategies to Prevent Healthcare-Associated Infection in Acute-care Hospitals* was utilized as the reference point. This document facilitates the translation of essential information into clinical practice, thus providing the rationale and level of evidence needed for discussion groups. Completion occurred with various key stakeholders within each hospital. One survey per hospital was compiled. **Results:** All hospitals completed the survey with key themes emerging and supported by observational data. Findings included variation with education, chlorhexidine bathing, types of dressings, and compliance with alcohol port protectors. Gaps identified with urinary catheter care included confusion surrounding catheter care, breaches in seals, and optimizing alternatives to catheterization. Rather than segment solutions for identified gaps, care bundles were developed to provide focus, to facilitate evidence-based practice, and to create standard work-around clinical audits that consisted of going to the patient rather than the electronic health record. Care bundles provided the 6 items to focus on and for which to create policy and standardize products. **Conclusions:** Care-bundle implementation initially created resistance from clinicians and many questions regarding actual practice. The design of the tool was deliberate in that audit language, the metric, and the "why" were included and served as a medium to discuss the evidence and immediate feedback for practice. Pareto charts were posted on unit performance boards. It became evident that compliance with prevention tactics was not consistent. Although number of infections or outcome data did not appreciably decrease, standardized utilization ratio was reduced by 11% for each device after 3 quarters. Process measures from bundle audits continue to improve, as do observational data, and these are part of focused discussions at quality forums. A culture change has occurred as process measures and evidence-based practice has become a priority.

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Poster Presentation

Catheter-Associated Urinary Tract Infection Reduction in the Solutions for Patient Safety Pediatric Safety Engagement Network

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Background: Catheter-associated urinary tract infections (CAUTIs) are a leading cause of healthcare-associated infection. Catheter insertion and maintenance bundles have been developed to prevent CAUTIs, but they have not been extensively validated for use in pediatric populations. We report the CAUTI prevention efforts of a large network of children's hospitals. **Methods:** Children's hospitals joined the Solution for Patient Safety (SPS) safety engagement network from 2011 through 2017 and elected to participate in CAUTI prevention efforts, with 26 hospitals submitting data initially and 128 participating by the end. CAUTI prevention recommendations were first released in May 2012, and insertion and maintenance bundles were released in May 2014 (Table 1). Hospitals reported on CAUTIs, patient days, urinary catheter line days (CLD), and they tracked reliability to each bundle. For the network, control charts were used to plot CAUTI rates, urinary catheter utilization, and reliability to each bundle component. **Results:** Following the introduction of the pediatric CAUTI insertion and maintenance bundles, CAUTI rates across the network decreased 61.6%, from 2.55 to 0.98 infections per 1,000 CLD (Fig. 1). Centerline shifts occurred both before and after the 2015 CDC CAUTI definition change, which may also have contributed to a centerline shift. Urinary catheter utilization rates did not decline during the intervention period. Network reliability to the insertion and maintenance bundles increased to 95.4% and 86.9%, respectively. **Conclusions:** Insertion and maintenance bundles aimed at preventing CAUTIs were introduced across a large network of children's hospitals. Across the network, the rate of urinary tract infections among hospitalized children with indwelling urinary catheters decreased 61.6%.

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