how quality improvement science has great applicability in infection prevention and hospital epidemiology. These measures aim to significantly reduce SSI rates and improve patient care.

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A Deep Dive into Post-Cesarean Section Surgical Site Infections

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Surgical site infection (SSI) is one of the most common complications following cesarean section (CSEC) and adds significant burden to the healthcare system. We aimed to explore factors associated with increased risk of these infections and to compare disease severity based on tissue level.
Observational study of post-CSEC SSIs from Jan 2021-Dec 2023 at Henry Ford Hospital in Detroit. SSIs were defined according to National Healthcare Safety Network (NHSN) criteria. Cases were categorized as superficial incisional (SI), deep incisional (DI) and organ space (OS). Demographics, risk factors, clinical features and outcomes were evaluated. DI and OS were grouped together into non-superficial infections for comparative analysis. 70 (3%) of 2,230 CSECs performed during the study period met post-CSEC SSI criteria, of which 41 (60%) were SI, 4 (6%) DI, and 25 (34%) OS (Table 1). Majority of patients were black (51.5%) with BMI>30 (56%), had Medicaid insurance (66%) and underwent emergent CSEC (60%). Anemia (hemoglobin 3 manual exams prior to surgery (55% vs. 29%, p=0.017) were significantly more common among patients with non-superficial infections. Receipt of perioperative antibiotics was similar between the two groups, and most were administered within 1 hour of incision; cefazolin was frequently used. Incisional pain and drainage were the most prevalent symptoms (Table 2). Abdominal pain (69% vs. 10%, 3 manual exams and worse clinical outcomes compared to patients with superficial infections. Implementing evidence-based practices and recommendations are therefore critical to reduce the morbidity associated with non-superficial CSEC infections.

Table 1: Demographics, comorbidities, and risk factors associated with post-CSEC SSI

	Total, N=70 (%)	Superficial Infection, N=41 (%)	Non-superficial infection, N = 29 (%)	*P*-value
Demographics				
Mean age (SD), years	30.3 (5.2)	31.5 (5.2)	28.6 (4.9)	0.689
BMI > 30	39 (55.7)	25 (60.9)	14 (48.2)	0.292
Black Race	36 (51.5)	15 (36.6)	21 (72.4)	**0.003**
Medicaid Insurance	46 (65.7)	28 (68.3)	18 (62.1)	0.589
Comorbidities and Risk factors				
Anemia	28 (40)	14 (34.1)	14 (48.2)	0.457
Diabetes	13 (14.3)	12 (29.3)	1 (3.4)	**0.006**
Chorioamnionitis	9 (12.9)	2 (4.8)	7 (24.1)	**0.018**
Smoker	3 (4.3)	0 (0)	3 (10.3)	**0.035**
Asthma	10 (14.3)	4 (9.7)	6 (20.7)	0.198
Hypertension	25 (35.7)	12 ((29.2)	13 (44.8)	0.181
Group B streptococcus	19 (27.1)	14 (34.1)	5 (17.2)	0.292
Perinatal STI	5 (7.1)	2 (4.8)	3 (10.3)	0.382
Substance Use	14 (20)	9 (21.9)	5 (17.2)	0.627
Previous abdominal surgery	31 (44.3)	21 (51.2)	10 (34.5)	0.231
Previous CSEC	34	25 (60.9)	9 (31.0)	**0.014**
Hospitalized within 1 month	10 (14.3)	7 (17.1)	4 (13.8)	0.710
C-section details				
Rupture of Membranes	31 (44.2)	13 (31.7)	18 (62.1)	**0.012**
Vaginal prep candidate	28 (40)	12 (29.2)	16 (55.2)	**0.029**
Vaginal prep performed	13 (18.6)	5 (12.2)	8 (27.5)	0.103
Number of manual exams >3	19 (27.1)	12 (29.3)	16 (55.2)	**0.017**
Surgical skin prep	65 (92.8)	40 97.5)	25 (86.2)	0.069
Emergency Surgery	42 (60)	19 (46.3)	23 (79.3)	**0.006**
EBL median (IQR), mL	885 (667-1383)	840 (561-1180)	1060 (698-1455)	0.322
Blood transfusion received	11 (15.7)	4 (9.7)	7 (24.1)	0.103
Peri-operative antibiotics	60 (85.7)	35 (85.3)	25 (86.2)	0.921
Abx administered <1 hour	48 (68.6)	28 (68.3)	21 (72.4)	0.711
Post-op factors				
Wound dressing removed	60 (85.7)	35 (85.4)	26 (89.7)	0.597
Wound clean/dry/intact	58 (82.9)	34 (82.9)	24 (82.8)	0.985
Post op anemia	69 (98.6)	41 (100)	28 (96.6)	0.231

EBL, estimated blood loss; STI, sexually transmitted infection

Table 2: Clinical manifestations and outcomes of patients with post-CSEC SSIs

	Total, N=70 (%)	Superficial Infection, N=41 (%)	Non-superficial infection, N = 29 (%)	P-value
Time since Surgery at Onset of infection, mean (SD)	13 (7)	15 (7.1)	10.8 (6.5)	0.213
Symptoms				
Incisional pain	38 (54.3)	24 (58.5)	14 (48.2)	0.396
Abdominal pain	24 (34.3)	4 (9.7)	20 (69.0)	**<0.001**
Fever	19 (27.1)	2 (4.9)	17 (58.6)	**<0.001**
Wound drainage	42 (60)	35 (85.4)	7 (24.1)	**<0.001**
Wound dehiscence	22 (31.4)	17 (41.5)	5 (17.2)	**0.032**
Vaginal discharge	7 (10)	1 (2.4)	6 (20.7)	**0.012**
Urinary symptoms	4 (5.7)	0 (0)	4 (13.8)	**0.014**
Outcomes & Complications				
Received Antibiotics	60 (85.7)	34 (82.9)	26 (89.7)	0.428
Duration of antibiotics, median (IQR)	7 (7-10)	7 (7-10)	7 (7-10)	0.080
Multiple courses of antibiotics	6 (8.6)	1 (2.4)	5 (17.2)	0.026
Cultures obtained	24 (34.3)	13 (31.7)	11 (37.9)	0.589
Required readmission	24 (34.3)	5 (12.2)	19 (65.6)	**<0.001**
Multiple admissions	4 (5.7)	0 (0)	4 (13.8)	**0.014**
Length of Stay, median (IQR)	3 (2-6)	1 (1-2)	3 (2-5)	**0.001**
ICU stay	2 (2.9)	0 (0)	2 (6.9)	0.088
Needed Intervention	18 (25.7)	5 (12.2)	13 (44.8)	**0.004**
IR drainage	7 (10)	3 (7.3)	4 (13.8)	
Surgical debridement	4 (5.7)	2 (4.9)	2 (6.9)	
Exploratory Laparotomy	7 (10)	0 (0)	7 (24.1)	
Uterine Dehiscence	6 (8.6)	0 (0)	6 (20.7)	**0.002**
Hysterectomy	3 (4.3)	0 (0)	3 (10.3)	0.035
Multiple Interventions	1 (1.4)	0 (0)	1 (3.4)	0.231
Death	0 (0)	0 (0)	0 (0)	

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Survival Analysis of Carbapenem Resistant Enterobacterales (CRE) Cases in Davidson and Surrounding Counties, Tennessee, 2016-2022

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Background: Carbapenem-resistant Enterobacterales (CRE) have become an increasing public health challenge in the United States over the past two decades. Carbapenemase-producing CREs (CP-CREs) significantly contribute to the spread of antimicrobial-resistant pathogens in healthcare settings. Tennessee has been conducting surveillance of CRE since 2011. As

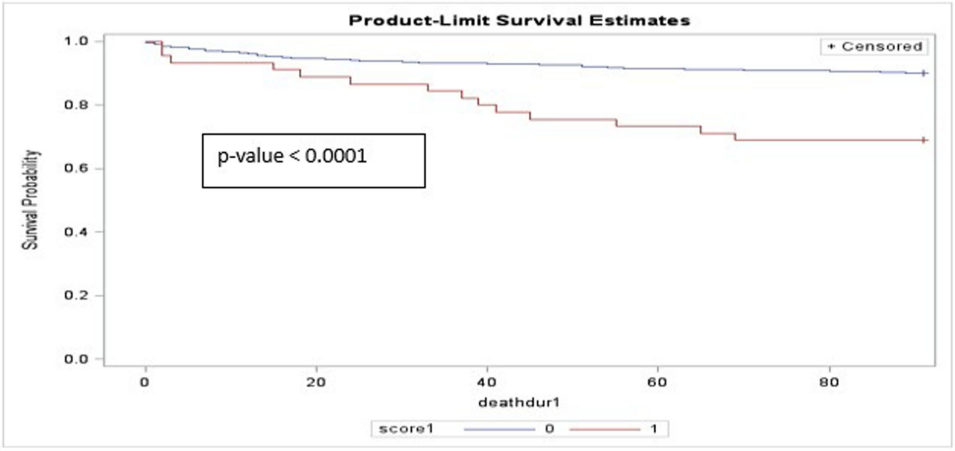
Table

Multivariable Cox Regression Analysis of Factors Associated with 90-Day Mortality Rate

Variables	Chi-Square	Pr > ChiSq	Hazard Ratio	Confidence interval
Age group (<=70 vs >70)	2.2176	0.1364	1.572	0.867-2.852
CP-CRE (Non-CP-CRE VS CP-CRE)	8.1610	0.0043	2.432	1.322 - 4.474
Sex (Male VS Female)	4.2408	0.0395	0.544	0.305 - 0.971
Charleson score (Low VS High)	18.6118	<.0001	4.176	2.182-7.996

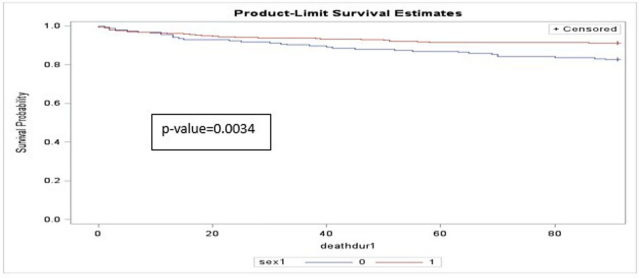
CP-CRE: Carbapenemase producing CRE.
Charleson score: High (>=5); Low (<5)

Figure1: 90-days Survival Estimates of CRE Patients by the Charlson Score Status



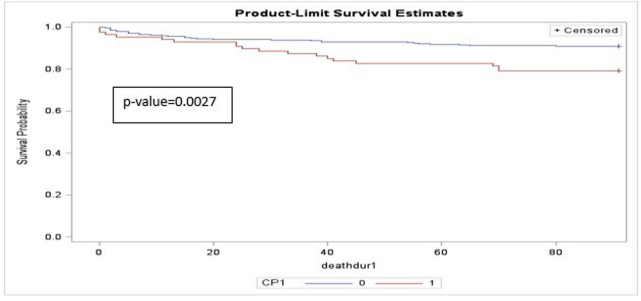
Score1: 1 = Charleson score >=5; 0 = Charlson score <5

Figure2: 90-days Survival Estimates of CRE Patients by Sex



Sex1: Female=1; Male=0

Figure3: 90-days Survival Estimates of CRE patients by Carbapenemase Production (CP) status



Deathdur1: Number of days from the date of specimen collection

CP1: 0= Cases infected with non Carbapenemase producing CRE pathogens tested; 1= Cases infected with Carbapenemase producing CRE pathogens

part of the Emerging Infections Program (EIP), the state has participated in population-based surveillance in Davidson and seven surrounding counties, collaborating with the Centers for Disease Control and Prevention (CDC) since 2014. **Methods:** The data collected through the Muti-site Gram-negative Surveillance Initiative (MuGSI) project, a collaboration between Tennessee and CDC as part of EIP, was used for this study. The analysis was performed on a subset of CRE isolates tested for carbapenemase production (CP) among all incident CRE cases collected from 2016 to 2022. Incident CRE cases are defined as the identification of carbapenem-resistant E. coli, Enterobacter cloacae complex, and Klebsiella species (K. aerogenes, K. oxytoca, K. pneumoniae, and K. variicola) from urine or normally sterile specimens (e.g., blood) from the residents of the surveillance area in a 30-day period. The mortality data was obtained from the Tennessee Vital Registry and merged with the surveillance data. Cox regression analysis was performed to evaluate if there is a difference in the 90-day survival rate based on the CP status of the pathogen, gender, age group, and the Charlson comorbidity index (CCI) score. Data analysis was done using SAS version 9.4. **Results:** There were 570 CRE cases reported during the study period (2016-2022). Of these, 406 were tested for carbapenemase production and 87 (21.4%) were positive for CP. There were 269 (66.3%) females and 137 (33.7%) males. Patients with higher Charlson comorbidity index score (> = 5) have significantly higher hazard ratios compared to those with low scores (HR 4.17; p-value) **Conclusion:** This study indicates that patients infected with CP-CRE, females, and those with high Charlson comorbidity index score have a significantly higher probability of dying within 90 days. These factors are worth considering when conducting a risk assessment of patients infected with drug-resistant gram-negative bacilli. The significantly increased risk of death among patients infected with CP-CRE highlights the need for timely carbapenemase testing and use of the test result for appropriate antimicrobial therapy and infection prevention.

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A Decade of Change: Shifting Trends in Carbapenemase-Producing Enterobacterales Among Hospitalized Patients

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Background: Carbapenemase-producing Enterobacterales (CPE) poses a major infection control challenge in healthcare settings. Over the past decade, Klebsiella pneumonia carbapenemase (KPC)-CPE colonization at our hospital declined to under 10% of all CPE rectal screens, while New Delhi metallo-beta lactamase (NDM)-CPE and oxacillinase (OXA)-CPE colonization rates have tripled, Figure 1. **Methods:** A comparative historical study was conducted on adult patients colonized with OXA-CPE (2017-